

THE TOPIC OF DANUBE AND ITS SCIENTIFIC, ECONOMICAL AND POLITICAL PROBLEMS IN THE GRIGORE ANTIPA'S VISION

Dumitru MURARIU¹
dmurariu.ibiol.ro@gmail.com

ABSTRACT: Referring to the *Romanian Strategy Development for next 20 years* published by President of the Romanian Academy, we remember the actuality of Grigore Antipa's book published in 1921 on *The Danube and its scientific, economical and political problems*. The book was republished by Dr. Dan Munteanu in 2005 and we underline the actuality of Antipa's thought with more than 90 years ago. Inside the mentioned Romanian Strategy of Development, the *European Danube Project and National Strategy of Danube* presents the today complex scientific, economical and social topics of the Danube downstream as well as the place and role of the country in the European area.

KEYWORDS: Danube's problems, genesis, evolution, actual hydrobiological situation, biodiversity conservation, sustainable strategy, national and European development.

Most people are knowing the name of Dr. Grigore Antipa because at the beginning of 20-ies century he founded the National Museum of Natural History in the actual building. Unfortunately, too many of us frequently are forgetting that Antipa was first Romanian hydrobiologist, all his life dedicated to the study of the Black Sea, to the Danube Delta and river itself. In 1921, Antipa published in the journal "*Studies and Research*" (*Studii și Cercetări*) of the Romanian Academy, the book *Dunărea și problemele ei*

¹ Membru corespondent al Academiei Române; doctor în biologie, director al Institutului de Biologie al Academiei Române, prim-vicepreședinte al Comitetului Român pentru Istoria și Filosofia Științei și Tehnicii al Academiei Române; președinte al Diviziei de Istoria Științei a CRIFST; președinte de onoare al Asociației Cultural-Științifice „Dimitrie Ghika – Comănești”.

științifice, economice și politice (The Danube and its scientific, economical and political problems). Fortunately in 2005, Dr. Dan Munteanu republished this book (191 pages) in Cluj-Napoca (S.C. Roprint S.R.L.) and remembered to all of us how realistic and deep was Antipa's thought on the Danube river. Today there are some very important projects included in the *Romanian Strategy Development for next 20 years* of the Romanian Academy, referring to the national problems of school and education, natural resources and strategic reserves, energetic security, informatics and data protection, food security etc. The topic no. 8 – *European Danube Project and National Strategy of Danube* suppose both Romanian policy in this field and Romania's place and role in the European area.

Coordinators of this project are Academician Cristian Hera – Vicepresident of the Romanian Academy and Academician Nicolae Panin – President of the Geonomic Sciences Department in the Romanian Academy. Starting with European Union Strategy for Danube Region and Action Plan, the coordinators are presenting a SWOT analysis of the Actual Situation in the Romanian Danube Region, a vision on the Romanian target in 2035, meaning the National Strategy in the field of Research and Innovation for the Romanian Danube Region.

Some basic fields of interest for the sustainable development of the Romanian Danube were predicted by Grigore Antipa in the third decade of 20-ies century. Therefore, this article is a tribute to the memory of first Romanian hydrobiologist, who represented Romania in the European Commission of Downstream Danube Administration.

In his book since 1921, Antipa characterises the Danube as the second river in length from Europe (after Volga), of 2,840 km long and with a hydrographical surface of 817,000 km² lays between two “black” points: Black Forest Mountains, from Germany, and the Black Sea. Flowing through 10 countries (Germany, Austria, Slovakia, Hungary, Croatia, Serbia, Romania, Bulgaria, Republic of Moldova and Ukraine) it is obvious that it is implied in political problems beside the hydrobiological and economical ones. The Danube is included in a competition of its own evaluation as a navigable way, with the possibility of creating a bound between the Black Sea and the North Sea, by Ludvig Canal (the Danube – Rhine basin, by the Main River).

Following these premises (the bound between western and eastern Europe, the interest of the river-side countries to have access to the Danube

mouth as well to the navigation on it), Dr. Grigore Antipa approached the problem of the Danube in all its complexity.

The first chapter is dedicated to the world importance of the Danube. Taking into consideration the figures representing the length of the river, the surface of the whole basin, the maximum flow (35.000 m³/sec. in 1897) and the medium ones (7.2530 m³/sec.), the author makes a comparison between the Danube and the Volga, the longest European river.

But because of its geographical position and the fact that it crosses Europe, the Danube has a higher international importance, it being “...*calea naturală cea mai dreaptă care leagă țările industriale din centrul și apusul Europei cu țările agricole și bogate în materii prime din estul Europei și sud-vestul Asiei și chiar cu țările îndepărtate din sudul și estul Asiei*” (... the most straight natural way which bounds the industrial countries from Central and Western Europe with the agricultural countries, rich in raw materials, from Eastern Europe and South-Western Asia and even with the remote countries from South and East Asia).

Dr. Grigore Antipa underlined the world importance of the Danube, citing the first king of Romania. When the latter was advised “...not to accept the crown of a country without future”, *Carol I* (Charles I-st), showing on a map, said that “...*pe aici trecând linia cea mai dreaptă între Europa și Indii, acestei țări îi este rezervat încă un mare rol în comerțul mondial*” (“...because through this country the most straight line between Europe and India passes, this country will have an important role in the world trade”).

In the second chapter, Antipa revealed the knowledge of the Danube Basin, with its relief and drainage slopes, precipitation and evaporation regime, structure and permeability of the ground, fauna, vegetation, etc. Complex knowledge of the Danube basin leads to a better understanding of its present flowing, its relation with the other river basins, and further, even to the explanation of the people migration and their settlements in the past, as well as to the perspective of the economical and political relations.

Therefore, in the fragment dedicated to the genesis of the Danube basin, it is explained the state of the European continent 20–30 million years ago, when western and eastern mountain depressions were covered by the Sarmatian-Tethys Sea, giving to the southern Europe the aspect of a mixture of islands and straights. From that sea, the Caspian Sea and the Black Sea resulted, and in the rest of the depression, the Danube basin

formed. Its bed was the result of a long evolution and erosion activity, transporting and depositing of the hard material of the earth crust of that region. Northwards, the limit of the Danube basin coincided with what Antipa called “*the continental ridge*” which divided the continent (excepting the rivers of the peninsulas) in two slopes: – north-western region, narrow with a drainage channel towards the Atlantic Ocean and the North and Baltic seas; – south-eastern region, wider, with the drainage channels towards the Mediterranean and Caspian seas. By the opening to the Rhine basin, the Danube was linked by the western countries of Europe, and to the Regensburg it passes through the Passau, Linz and Wien ravines and forms the upper flow of the river.

The middle part of the Danube basin is at the Czech Moravia mouth (in 1921) till the Iron Gates. From the Iron Gates the lower part of the Danube begin, with an important opening to the Black Sea, which permit the prolongation of the navigable way in the waters of the Black Sea, towards the countries of the Tigris and Euphrates, to Georgia and the basin of the Caspian Sea, linking it the large trade way towards India, and through Bosphorus, with the Mediterranean countries, and through Suez and Gibraltar, to the world navigation and trade large ways..

Antipa considered that we own the harmony of nature and the facilitation of the traffic on the European continent to the Danube basin, since the antiquity allowing the movement of many people, who finally settled and formed the present populations. Also Antipa gave an example for underlining the importance of this river: – the transport of Romanian cereals “*...care, pentru ca să ajungă la consumatorul lor din Germania, fac un drum pe mare, de 3 ori mai lung decât l-ar face în susul Dunării...*” (“...which reach Germany following a road three times longer if they were transported along the upper flow of the Danube...”).

Chapter III of the book deals with the formation of the Danube flow, which crosses the mountains through 8 passages. The upper flow is supplied by the tributaries which run from the Alps. The middle flow crosses all mountain chains which link the Alps by the Carpathians. Within the section of the lower flow, the activity of the Danube is impressive. At the confluence with Ialomița river, it divides into two branches, forming an arch which includes Brăila island, and then penetrates deeply Măcin Mountains.

The characteristic of the lower flow or downstream of the Danube is the increasing of the water quantity and decreasing of the flowing slope,

which leads to the reducing of the flowing velocity as well to a fluctuation of the discharge (maximum 35.000 m³/sec, minimum 2.000 m³/sec). This presumes the existence of a large floodplain. Antipa considered that a floodplain is a „...supapă de siguranță a fluviului în timpul creșterilor” (“... safety valve of the river during the increasing of its discharge”).

Thus, in the paper it is approached the difference between the minor river bed, where the water flows in a normal state, and the major river bed, with flooded lands. The period and the duration of the discharges generate a production directly proportional to the flooded surface.

Chapter V deals with the scientific and practical problems of the Romanian Danube. The first part refers to the previous chapters on the evolution of the river and the regime of its waters, creating subjects for geologists', geographers', hydrologists', zoologists', botanists' work, and even for the historians', archaeologists', prehistorians', anthropologists', all being excursions in the field of the “pure sciences”. The second part of this chapter refers to the applications of the scientific researches for solving some economical and technical problems in which the Danube is implied, in order to use this natural richness where technicians, agronomists, zootechnicians, hydrobiologists, pisciculturists, forest rangers, hydrotechnicians, chemists, etc carry on their activity.

Giving example the improvements made at the Razelm Lake, for the maintenance of the regular discharge channels and for the fish migrations, Antipa pleaded for the increasing of the fish production of the Danube waters. He proved that there are enough funds for such kind of works „... căci ele se plătesc singure, în scurt timp, din propria lor producție, cu numai mai multă seriozitate și bunăvoință și mai puțină birocrație și politicianism...” (“because they pay themselves, shortly, from their own production, but it is necessary more seriousness and goodwill, and less bureaucracy and politics”). Only a serious exploitation regime of fishing, prohibition during reproduction and sparing the young fish are necessary.

Regarding the evaluation of the large surfaces of the Danube floodplain, Dr. Grigore Antipa was against the damming of the Danube which could lead to the increasing of the water level and the crashing of the dams, villages and towns from the left bank of the river might be devastated. The Danube mouth could get stuck and „...terenurile apărate ar pierde cu timpul valoarea lor” (“the protected lands might lose from their value”). Separating the marshes from the river, the first ones could become

unproductive. „Îndiguirile trebuiesc doar restrânse la acele terenuri mai înalte care se potriveşc pentru a fi exploatate, iar acestea trebuiesc amenajate pentru a fi exploatate prin cultură alternantă de agricultură cu piscicultură: adică fiecare teren să fie împărţit cu diguri în mai multe bazine şi fiecare bazin va servi câţiva ani la culturi agricole şi apoi să fie inundat pentru a servi la cultura intensivă a crapului ş.a.m.d.” (“The dams has to be made only on the higher lands, which are proper for being exploited, and they have to be prepared for an alternative cultures, agricultural and fish breeding: i.e. each land to be divided by dams in several basins and each of these basins to be exploited with different cultures, for several years, and then to be flooded for an intensive carp breeding, and so on”).

Besides the lawns and hayfields from the floodplain, Antipa considered necessary a better evaluation of the reed (which cover a surface of 270,000 ha in the Danube Delta), club rush, horse chestnuts, medicinal hubs as well of the marsh forests of willows, poplars, etc.

Considering the soil fertility of the Romanian Plain and the low summer precipitations, Antipa raised the irrigation problem, by which „...suprafeţele udate vor deveni tot mai mari şi culturile mai bogate...” (“...the wet surfaces would become larger and larger and the cultures, richer and richer”). On the other hand, the 30 m level difference along the Danube flow, from Turnu Severin to Moldova (a shortcoming for navigation), can be used as an advantage for the electric power production, this idea being fulfilled later, by the Iron Gates I and II electric power plants.

Chapter VI is dedicated to the navigation on the Danube, which is linked by the basins of other rivers, either for reaching other seas or „...pentru a aduna mărfurile din toate părţile şi a le aduce spre Marea Neagră. Barele de nisip de la gurile Dunării, bancurile mişcătoare de pe traseu şi stâncile din albia de la Porţile de Fier sunt între obstacolele naturale ale navigaţiei. Politica separată a fiecărui stat riveran la Dunăre este în defavoarea interesului comun, de a-şi juca rolul ei mondial iar regulamentele de navigaţie şi textele impuse de unele ţări sunt obstacole de natură politică” (“for gathering wares from all directions and to transport them to the Black Sea. Sand barriers from the Danube mouth, moving islets along the river flow and the rock from the Iron Gates are natural obstacles of navigation. The separate politics of each riverside country from the Danube is against the common interest, because they play their part in world politics and the navigation rules and the compulsory fees are political obstacles”).

Antipa underlined the above-mentioned idea considering that the navigation on the river is more expansive than on the sea, and along the Danube there aren't enough ports. The Danube mouth assure 2/3 of the Romanian export on water (80% from the total export), while Constanța – only 1/3. The European Council, funded in 1856, supported Romania only for two years in front of the idea of closing the Danube mouth in order to protect the traffic in the Odessa seaport and of a probable dominance upon Moldavia and Wallachia.

Chapter VII is entitled „*Regimul Dunării în urma tratatelor de la Paris*” (“The Danube regime after the Paris convention”) by which the navigation regime on the Danube was established.

Antipa considered that the main problems of the Danube are: „*punerea și menținerea în cea mai bună stare de navigabilitate a întregului fluviu și gurile sale, astfel ca să poată circula pe el vase de un tonaj cât mai mare; legarea Dunărei prin canale cu bazinele celorlalte fluvii; asigurarea libertății navigațiunii pentru vasele de comerț ale tuturor națiunilor, cu respectarea deplină a drepturilor de suveranitate ale riveranilor și cu excluderea oricărui interes lăaturalnice și tendințe de acaparare și monopolizare sau de amestec în afacerile care decurg din acest drept de suveranitate*” (“the arrangement and maintenance of the whole river and its mouth for a good navigable state, so that high weight ships to transport the wares; to bound the Danube by the other river basins by canals; the assurance of the free passing of all trade ships, no matter the country they belong to, with the full respecting of the riverside countries and the rejecting of all inside interests and tendencies of monopolizing and interfere in the business affairs of the sovereign countries”). These requirements presume the organization of the riverside countries towards a common work.

Chapter VIII presents the interest, importance and obligations of Romania on shipping on the Danube: – the maintenance of the waters in a good state using the improvements brought by the modern science and techniques; – o attract the river and sea trade and permitting the circulation and trade for everybody.

Chapter IX presents the statute project of the Danube, established during the Paris International Conference. Antipa shows his disapproval and take up attitude against the menace to the fundamental rights and interests of Romania, his protest to the attitude to some proposals made by Romania. Antipa was convinced that a such an important problem and

so topical as the Romania's rights to the Danube can be solved by a clear situation, which can generate a real and durable friendship between countries, on the base of the mutual respect of their own rights and interests.

Chapter X, „*Chestiunea Stari-Stambul*” (“Stari-Stambul Problem”), presents the Romania's fight for resisting at the mouth of the Chilia Branch, within the conditions in which the problem of a new border of the territorial waters was raised. Only the changing of the relations between countries led to a convention to spare the fishing, approved also by the governments of Russia, Serbia, Bulgaria and Hungary.

As regards this problem, Antipa submitted a statement, in 1896, on the border of the marine waters at Stari-Stambul mouth, which underlined not only the problem of losing or gaining a sea surface but also the problem of the Danube. Clarifying the ideas of geophysics, mouth, estuary, barrier and thalweg, and that of international rights, on the one hand, and knowing that the Black Sea do not have tide, and the Danube mouths are enlarged like an estuary, the sea water can stretches the coast line which forms the line between land and sea. Taking into consideration the characteristics of the Stari-Stambul mouth, Antipa showed the correct limiting line of the territorial sea, established on the basis of the perpendicular principle on the general direction of the coasts. According to this line the Snake Island was recognized as belonging to the Romanian Danube Delta.

Dr. Grigore Antipa's way of thinking, basing on his deep knowledge in biology, in general, in hydrobiology but also his economical and political spirit gave us an everlasting work, which kept its actuality in its fundamental aspects, now in the second decade of the 21st century.

Just by this actuality of the themes approached by Dr. Grigore Antipa, the book „*Dunărea și problemele ei științifice, economice și politice*” (“The Danube and its scientific, economical and political problems”) exceeds the specialists' interest, addressing to all Romanian people and the citizens of the riverside countries.

These are the reasons why I appreciate the voice of the Romanian Academy, expressed by the President – Academician Ionel-Valentin Vlad in the *Strategy of the Romanian Development in next 20 years* with most important problems of the Romanian society, the *European Project of the Danube and National Strategy of Danube* being presented with complex scientific, economical and political updated problems, some of them mentioned by Grigore Antipa with more than 90 years ago.