PROFESSOR PETRE GÂŞTESCU

ION ZĂVOIANU[1]

Petre Gâştescu was born on November 13, 1931 in Soci Village, Miroslăveşti Commune, Iaşi County. He attended primary school in his native village, passed on to "Veniamin Costache" Seminar in Iaşi, and graduated high-school in Paşcani. Then he enrolled at the Faculty of Geology – Geography, Geography Dpt., Constantin I. Parhon University in Bucharest, graduating from it in 1955 with an emeritus diploma. In 1961, he took his Ph. D. (superviser Prof. T. Morariu) at "Babeş - Bolyai" University in Cluj – Napoca. In 1971, his scientific achievement won him the title of "doctor docent" and in 1972 the right to supervise Ph. D. students. On the occasion of the Romanian Academy's centennial (1966) Prof. Gâştescu was awarded the "Scientific Merit" Medal and in 1971 the "Gheorghe Murgoci Prize" for this work *Lakes in Romania.*

On his 70th birthday, Prof. Petre Gâştescu is at the zenith of his scientific and teaching career. His focal interests are hydrology, in general and limnology, in particular, as well as many more issues in connection with the River Danube, its Delta, and the Romanian Black Sea coastal area. A good organiser, he was first the head of a research-team first and then of the Physical Geography Laboratory of the Institute of Geography. A gifted and dedicated researcher, he kept widening the field of his scientific interest. The wide range of his studies could be grouped into few major directions as follows:

Limnology. This area concentrated the Professor's research endeavours at a time when this discipline was little dealt with, merely in a series of articles or sequential approaches. His was a successful attempt from the very biginning, both in regard of aproach, research methodology, analysis and interpretation of results.

Prof. Gâştescu's doctoral thesis (1963) *Lakes in Romania – genesis and hydrological regime,* had no precedent in limnology. It was the outcome of numerous field investigations, planned out in great detail, to gather as many relevant information on the subject as possible and further associated with analyses of cartographic and archive materials and literature documentation.

In all his stuidies the Proferssor depicts the lake as an open system in a permanent state of matter and energy exchange with the environment. This very progressive outlook fell in line with the latest conceptions worldwide. The complexity of the subject and the modern analysis methods concerning the origin of lacustrine depressions, the hydrological regime of lakes and the principles of their classification have represented as many guide-lines, models and stimulants to new limnological research in Romanian and abroad, where his work *Lakes in Romania* was very well received. It also represented a startion point for in-depth regional research within the university centres of Cluj, Iaşi and the Romanian Academy's Bucharest-based Institute of Geography that materialised in many valuable works. So, we can rightly say that Prof. Petre Gâştescu is the founder of the Romanian School of Limnology. His major research preoccupations in this area are the following:

Genesis of lacustrine depressions and classification of lakes is a fresh study and central trend both in Romania and worldwide (see the specialist literature). Viewing the lake ecosystem as a systemic unit represents the latest of modern geographycal and biological conceptions. Let's recall only some of the original results reached by Petre Gâştescu: the correlation between the bathymetric curve and the genetic types of lake; the drawing up of maps of genetic lake types in Romania; the classification of lakes by the origin of lacustrine depressions and by big relief units.

Water balance and hydrological regime of lakes are fundamental elements for the very existence of these ecosystems. He studied them in terms of temporal variation (monthly, seasonal, annual and multiannual) and spatial variation (in the glacial realm in the Romanian

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Plain and in the Danube Delta, the newest landform in Romanian territory). Some particularly interesting results are: the definition of the lake surface index as the ratio between lake area and its drainage basin. According to it, lakes have an excedentary, equilibrated or deficitary balance. Prof Gâştescu made lots of measurements and determinationns of the water balance elements in order to outline the relationships between the Danube's channels and lakes in terms of the hydrological regime phases. His manysided experience enabled him to obtain extremely interesting results for science and practice with the other components of the geographical environment, too.

Thermal regime of lake waters is another basic element of the lacustrine ecosystem studied in detail in terms of time and space vanation. The lakes were chosen by representative relief units and direct measurements followed the variation of the thermal regime during the year, in the day-time and throughout the succession of seasonal phases. The observations and measurements of salt lakes, emphasizing the presence of a heliothermal layer and the persistence of high tempersatures in water, were of particular practical value for spa cures and even for storing the thermal energy. Other investigations focused on the heliothermal layer in some 34 of the 69 salt lakes present in Romania. The conditions for the existance of this layer are: small lake area, great depth, high degree of salinity which increases with the depth, reduced water exchange between the upper and the lower horizons, the presence of a fresh or salmastrian water layer (0.5 – 1m) on the surface, higher surface temperatures in the warm season which, through thermal convection, are transmitted at a depth 0f 1.5 – 3m and remain there for a long time.

Hydrochemical characteristics of lakes had been sporadically studied before. Prof. Gâştescu undertook their systematic observation, following the mineralisation grade, type and processes of hydrochemical metamorphisation with seasonal climatic variations, lithological substrate and supply sources. A detailed knowledge of the mineralisation grade was obtained by processing and interpreting hydrological and balneological archive data published works and the samples collected during field trips and analysed in the laboratory. On the basis of this data set, some general hydrochemical features across the country, as well as some particular aspects, e.g. variation of lake ice and water, or relationship between lake water and ground water chemism in the N-E Romanian Plain were explained. The results, extremely valuable, were reported in various articles, in the work *Lakes of Romania. Regional Limnology* (1971), in *A Treatise of Romania's Geography* Vol. I – *Physical Geography* (1983) and in many publications put out at home and abroad.

Anthropic lakes represent the main possibility to use water resources in a rational manner. This type of lakes has an old tradition in Romania. As the country's social-economic background developed, the diversity and size of these man-made reservoirs has significantly increased, as has their impact on the environment, a reality reported in many articles. The classification of these lakes in terms of the water refreshment index, relevant to establishing the capacity of this type of lacustrine ecosystem to meet this requirement, is a very original contribution.

The findings published in domestic or foreign journals (articles) and in books were received with interest and warmly appreciated by renouwned specialists in the field, e.g. Riccardo Riccard, Maurice Pardé, René Frécaut etc., Prof. Gâştescu being elected corresponding member of the Italian Geographical Society.

Hydrogeographical research. Defined as a comprehensive water science, dealing with the distribution of water in time and space and with the relationship between water resources and the other natural or social-economic factors, Hydrogeography was a research trend particularly embraced and promoted by Prof. Gâştescu. Proceeding from the definition given by Keller (1962), and Mihăilescu (1968) and the methodology used by the French and Polish schools, he made substantial contributions to this field within a team-work approaches, promoting these conceptions within the Institute of Geography and stimulating his Ph. D. students to take up the subject in their doctoral thesis. The results were discussed at several

national gatherings, reported in his work The *Geography of the Romanian Valley of the Dabnube* (1969), or in articles published alone or together with the members of his research-team. From all his writings it clearly emerges that Hydrogeography is both an analytical and synthesis science which views water resources as one of the important environmental elements integrated into the geographical patterns of a territory. This conception constituted the groundwork for very many elaborations on water resources in Romania in close correlation with the physical-geographical and social-economic factors.

Regional studies. Apart from comprehensive approaches at national territorial level, the Professor was permanently interested in the regional reality, in general and that of the SE of Romanian, in particular (Romanian Plain, Danube Delta and Romanian Black Sea coast), outstanding being the *Danube Delta.* His field trips there, spanning the interval between 1960 – to date, have been aimed at the discovering of new aspects concerning the relationships established among environmental components. During the 1960-1975 period his involvement with the area was occasional, but was continued afterwards on a permanent basis under annual contracts concluded with the Danube Delta Central until 1989, and with the Danube Delta Research-Design Institute ever since. In his numerous yearly trips Petre Gâştescu initiated and followed up systematically a network of hydrometric gauges placed at characteristic points and read by local observers. At the same time, he measured the discharge and suspended sediment loads in backwaters and canals, taking samples for hydrochemical assayings. Thus, additional information and the data provided by state-supervised hydrometric gauges helped completing the data set. The conclusions reached proved useful not only to geographical research but also to the complex management of the Danube Delta.

Prof. Gâştescu studied in detail the hydrological balance of some lake complexes, e.g. Mati¡a – Merhei – Bogdaproste, Roşu – Puiu – Lumina, etc. and their relationship with the main arms of the Danube. By measuring the water flow and by establishing the direction of the folw it was possible to determine the threshold on which water circulation changes: from the arms to the lake at high water levels and reversely at low levels.

The hydrological balance and the flow rates in backwaters and canals were used to assess the water volume refreshment index in these lakes, an essential element in the process of eutrophication and the existence of the fish fauna in the Danube Delta and lakes.

A distinctive concern of Prof. Gâştescu's was the mapping of the delta space that had deeply changed over the time through agrarian enclosures, fish farms, reed or forest exploitations. All these modifications and the respective toponymy were marked on the 1983 map, (scale 1: 75 000) updated and reprinted in 1986, 1992 and 2001 on the scale of 1: 150 000; texts in Romanian, French, English and German.

After 1989, Prof. Gâştescu became more involved in this part of the country declared a Biosphere Reserve in 1990. In that year he was elected on the Danube Delta Biosphere Reserve Scientific Council; after 1995 he become the coordinator of the *Atlas of the Danube Delta Biosphere Reserve* which is to be printed soon. Under the research programme of the Reserve, several thematic maps have been published. We shall recall only the *Map of the Danube Delta Ecosystems,* co-author M. Oltean, Ph.D. from the Institute of Biology. Petre Gâştescu has been representing Romanian Geography at various national and intenational scientific gatherings, an opportunity to make known his excellent results.

Noteworthy, he came with the proposition for such an event to be organised in Tulcea (July 1999) by the Danube Delta National Research-Design Institute and got himself thoroughly involved in its organisation. At his proposal, an international scientific meeting on *The Delta's State-of-the-art- Protection and Management* was organised in Tulcea – Romania, a good occasion for foreign specialists to become acquainted with the Danube Delta and its problems.

The Romanian Black Sea Coast from the Razim-Sinoie complex in the north to Mangalia in the south, as well as the coastal lakes, coastal morphodynamics and

management have been a focal research concern of the Professor's for the past ten years, with highlight on the genesis of lacustrine cuvettes, hydrologic balance and hydrochemical particularities, uses and current management issues. His studies of the seacoast morphodynamics concentrated on the slow rise of the Black Sea level (0.18-0.2 cm/year) and the significant depletion of Danube-carried sediments from 58.7 mill. t/year over 1921-1980 to only 28 mill. t/year between 1980-1990 and the hydrotechnical constructions–Sulina and Cape Midia dams, which derailed the littoral drift. As a result, over 60% of the Romanian coast is subjected to abrasion with accumulation standing at 40%. The temporal evolution of these processes is detectable in the cartographic documents elaborated by specialised bodies in the course of time.

An outstanding specialist in sea coast issues, Prof. Gâştescu accompanied in 1991 a group of World Bank experts to the Romanian littoral; the following year he attended a specialisation course in the US. At present, he is a member of the "Littoral Commission" established by Government Decree. He was Romania's representative at several international meetings on marine coast issues held in the US, Italy, and The Netherlands, where he presented notable papers on the sea coast management in Romania.

Teaching activity, intermittent over the 1970-1994 interval, and permanent ever since. 1970-1994 lecturer, at Bucharest University, The Pedagogical Institute (1970-1972). Courses delivered: 1975 – 1989 *Hidrology and Physical Geography of Romania* at the Faculty of Geography, Bucharest University, 1992-1995 Dean of the Faculty of Tourism Geography, Dacia University –Buzău; 1994: Assoc. Prof. Faculty of Geography, Bucharest Universaity. Courses delivered and printed: *Ecology of Human Settlements, Management of the Environment* and *Sustainable Development of Human Settlements*. That same year (1994) he won the competition for the vacancy of full professor at "Valahia" University based in Târgovişte, where he teaches *Hydrology, Limnology, Oceanography* and *Regional Geography of Romania.* He also acts as major professor for B.A.M.A. and Ph. D. students, organises scientific sessions of the professional staff and students. In 1994 and 1998, under the aegis of this University, he organised two colloquia on population and settlements.

Geographical information has permanently focused the attention of Prof. Gâştescu. He published a series of books of broad interest , e g. *Lakes of the Earth; Islands of the Earth* and *Rivers of the Earth*, as well as articles in journals and daily newspapers, took part in radio broadcasts, also heading a course in *Fragile Ecosystems* at the Black Sea Summer University. The Professor also held membership on the editorial board and acted as deputy chief editor for the journals *Studii şi Cercetări de Geografie, Revue Roumaine de Géography* and *Hidrotehnica,* was a member on the board of *Atlasul Geografic Na¡ional, The Geography Treatise* and *Jude¡ele Patriei* collection, making an excellent professional and organisational contribution. As Vice-chairman of the Paleogeography Commission of IAHS, Secretary and Vice-chairman of the National Geographic Committee and member on the Romanian Academy's commissions for the Monuments of Nature, Limnology and Ecology, Petre Gâştescu spared no efforts in promoting and assessing Geography within the framework of interdisciplinary research.

It is the merit of Petre Gâştescu acting as major professor and coordinator of 15 Ph. D. theses already accomplished, and 16 more underway, to have selected original and very interesting subjects for his candidates. One of his students sustained her doctoral thesis in France at Aix – Marseille I University, a second one being in course of preparation there. As a specialist, he was appointed to refer on 43 Ph. D. theses at the Institute of Geography, and the Universities of Bucharest, Iaşi, Cluj-Napoca and Gala¡i, being a mumber of the Researcher-staff Promotion Commission at the Institute of Geography, and Teachers Promotion Commission at the Universities of Bucureşti, Iaşi, Cluj-Napoca, Craiova, Gala¡i, Constan¡a, Timişoara, Oradea, and Suceava.

At this anniversary moment we would like to expres our full gratitude to Petre Gâştescu, the man who has placed all his energies and perseverence in his research and

teaching pursuits, in creating new trends in Limnology and Hydrology, and in training a qualified personnel. He has been an active ambassador of Romanian Geography to international scientific events and IGU congresses. The prodigious activity of this high-profile scientist and his steady efforts to sustain the study of Romanian Geography has materialised in over 230 articles and books published at home and abroad as only author or co - author, in his membership on 11 national specialist societies, committees and commissions, on 10 editorial boards of specialist journals and in many other activities, contributing to the prestige of Romanian geographical research in his own country and worldwide.