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### IN MEMORIAM

#### **Farewell to Professor Emelyan Mikhailovich Emelyanov (November 7, 1934 – October 2, 2017)**



Емельян Михайлович Емельянов. Фото: А. Б. Деменина (2015)

The scientist, Doctor of Science in Geology and Mineralogy, Professor Emelyan Mikhailovich Emelyanov passed away. He is widely known in the scientific community as a major specialist in the geology of the Atlantic Ocean and the seas of its basins: the Baltic Sea, the Mediterranean Sea, and the Black Sea. E. Emelyanov's focus of interests included geological structure and mapping of the ocean bottom, sedimentogenesis and ore formation, paleoceanology, geoecology.

E. Emelyanov was born in the Pogorelets village, Suwalki district, Poland, in the peasant family. His family moved to the Soviet Union and settled in Lithuania in February, 1941. Roughing, war, frequent moves from place to place and, against all the odds, irresistible optimism, persistent craving for knowledge had already characterized the future scientist. E. Emelyanov had graduated the Šilutė town school in 1952 with a silver medal, entered the Vilnius State University, Department of Geology and Mineralogy of the Faculty of Natural Sciences. The graduation day in the University was in 1958; he obtained the geological engineer degree with honors.

From that very moment the entire life of E. Emelyanov belonged to the P. P. Shirshov Institute of Oceanology, the Academy of Sciences of the USSR (since 1992 – the Russian Academy of Sciences). Initially he worked at the Black Sea Experimental Research Station, the future Southern Branch of the Institute (Gelendzhik city), where the Mediterranean Sea research of his started. E. Emelyanov became a participant of the first oceanological expedition on the „Academik S. Vavilov” vessel in 1960s.

He moved to Kaliningrad in 1963, where kept his career going the Kaliningrad (later - Atlantic) Branch of the Institute by establishing and leading the group of marine geology. E. Emelyanov had obtained the candidate of science degree in geology and mineralogy in 1964; his thesis was devoted to the sedimentogenesis of the Mediterranean Sea. His marine geology group was turned into a Laboratory of Geology of the Atlantic in 1967. E. Emelyanov used to be the head of this lab until 2006, and after that he was its scientific adviser. He had obtained the Doctor of Science degree in geology and mineralogy in 1979, the thesis theme was „Sedimentogenesis in the Atlantic Ocean basin and its zoning features”. The title of professor of geology of the oceans and seas he got in 1983.

During decades of working in the Institute of Oceanology E. Emelyanov was involved in many scientific expeditions to the Atlantic, Pacific and Indian Oceans, the Baltic and Mediterranean Seas both as leader and as ordinary member. He was also an active participant of international scientific projects, for instance, in the Baltic Sea studying, he collaborated with Lithuanian, Polish, German, Danish, Swedish and Finnish scientists. Especially close and fruitful cooperation he had with the Leibniz Institute for Baltic Sea Research (Warnemünde), especially with Professor J. Harff. E. Emelyanov represented Russia in the working group of the Intergovernmental Oceanographic Commission of UNESCO (IOC UNESCO) on the compiling of geological and geophysical maps of the Mediterranean and Black Seas and also was a member of the editorial board of this project. He

was among the editorial board members in the international journals „Baltica” and „Geologija”.

Professor E. Emelyanov is undoubtedly one of the founders of Soviet (and later Russian) marine geology. He published about 600 scientific works (individually and in co-authorship), including 20 monographs and 48 geological and geochemical maps (both published separately and as a part of atlases) and five popular-science books.

The geological mapping of bottom sediments is that thing that plays an important role among his scientific achievements. Thus, the results of 1960s research formed the basis for a series of lithological and geochemical maps of the Atlantic Ocean prepared by the Interdepartmental Geophysical Committee of the Academy of Sciences of the USSR and published in 1969 by the Main Directorate of Geodesy and Cartography at the Council of Ministers of the USSR. These maps describe types of bottom sediments, content of calcium carbonate, iron and manganese in sediments, show sediments grain size.

Professor E. Emelyanov became a co-author of several maps in the „Atlas of the Oceans. Atlantic and Indian Oceans” a fundamental scientific work, published in 1977 by the Main Directorate of Navigation and Oceanography of the Ministry of Defense of the USSR. Those maps involved bottom sediments, grain-size composition (sand, aleuritic, pelitic and subcolloid fractions), and content of calcium carbonate, organic carbon, iron and manganese in sediments. In 1990s, these maps were updated and published in the currently valid International Geological-geophysical Atlas of the Atlantic Ocean (edited by G.B. Udintsev), published by the Ministry of Geology of the USSR under the auspices of the Intergovernmental Oceanographic Commission of UNESCO (IOC UNESCO).

In 1996, as part of a major international project E. Emelyanov and co-authors published a map (10 sheets) „Unconsolidated bottom sediments of the Mediterranean and Black Seas” (1: 1 000 000). The publication was carried out by Main Directorate of Navigation and Oceanography of the Russian Navy under the auspices of IOC UNESCO.

During many years of research, E. Emelyanov succeeded in revealing a number of fundamental regularities of ocean sedimentogenesis:

- the important role of climatic zoning in sedimentation and rock formation in the Atlantic Ocean (in conjunction with Academician A.P. Lisitsyn and other co-authors) was confirmed;
- geochemical barriers and barrier zones in the ocean were investigated along with their role in sedimentogenesis and ore formation;
- E. Emelyanov was the first geologist to suggest that a sharp alternation from oxidation to reduction leads to the formation of carbonate-man-

gane ore and, on the example of the Baltic Sea basins (with periodic contamination of bottom waters with hydrogen sulphide), proposed a model for the formation of carbonate-manganese silt, which subsequently is converted to ore (this theory found application in explaining the formation of manganese deposits and noted in many scientific publications as pioneer);

- the „rules of fractions” were defined, allowing to estimate the content of chemical elements in the sediments by grain-size composition and, thereby, significantly reduce the amount of field work and correctly interpret the results during the geochemical bottom mapping and environmental conditions research.

It was a big deal for E. Emelyanov to introduce his scientific results into practice. He was engaged in environmental safety of the Baltic Sea and its coast, the Curonian and Vistula spits in particular, the mineral resources exploration in the ocean.

Along with the active scientific work E. Emelyanov had paid attention to the upbringing of young scientists. His popular science book „The Ocean Famous and Enigmatic” was published in 1987 and 2013. The author devoted almost fifty years of his life to oceans study. His own experience confirmed two main features of being oceanographer: this profession is fascinating, but it is also true that the more scientists learn about the ocean, the wider the new questions circle become. Therefore, the purpose of his popular scientific books is also to capture the attention of new generations of researchers who are probably still sitting at the school desk or in the student’s room. His autobiographical books, which allow us to understand better the personality and destiny of this outstanding man, are written with astonishing sincerity and simplicity.

From 1996 to 2005 within the Federal Targeted Program „Integration of Science and Higher Education” the Baltic Educational and Scientific Center for Oceanology and Geoecology was created due to initiative of Professor E. Emelyanov; this center organized and conducted the student practices from both Kaliningrad and leading Moscow universities (Lomonosov Moscow State University; Moscow Institute of Physics and Technology). From 1996 to 2004 E. Emelyanov worked as a professor at the Geoecology Department of the Kaliningrad State University (later Immanuel Kant Baltic Federal University). From 1995 to 2015 was a member of the Dissertation Supervisory Committee at the aforementioned university. E. Emelyanov used to lecture various marine geoecology aspects in Lomonosov Moscow State University and in several universities in European countries: Vilnius and Klaipeda (Lithuania), Greifswald (Germany), Stockholm, Uppsala and Gothenburg (Sweden), Warsaw and Gdansk (Poland).

Under the leadership of E. Emelyanov 12 researchers obtained their candidate of science degrees. In his laboratory such well-known marine geologists as A.I. Blazhchishin, O.S. Pustelnikovas, V.M. Litvin, E.S. Trimonis, G.S. Kharin, N.P. Lukashina developed. He created a scientific school, which in 1998 became the winner of the contest „Leading scientific schools of Russia”.

He also conducted scientific and educational work in public organizations, for example, at the Russian Academy of Natural Sciences, since 1991 as a corresponding member, and since 1995 as a full member. For many years he was a member of the Russian Geographical Society, and in 2000 joined the Russian Geological Society, where he became one of the organizers and members of the board of the Kaliningrad branch.

Professor E. Emelyanov scientific merits are widely acknowledged. In 1999 he was awarded the title „Honored Science worker of the Russian Federation”; later he was awarded by three government awards, including the „Order of Honor” (2005), two „Honorary Diploma” of the Presidium of the Russian Academy of Sciences. The government of the Kaliningrad region noticed the merits of E. Emelyanov twice: by the award „Eureka” (2008) and the medal „To the 70th anniversary of the Kaliningrad region” (2017). He was one of the first to be awarded a commemorative medal „Academician P. P. Shirshov” (2014) by Head of the Institute of Oceanology.

Professor E. Emelyanov also attained prestigious public awards: the diploma and the honorary sign (cross) „For Merits in the Development of Science and Economics of Russia” (2004) by the Russian Academy of Natural Sciences, A. E. Fersman medal „For Merits in Geology” (2014) by the Russian Geological Society, two „Honorary Diplomas” of the Russian Geographical Society. For his great contribution to geology and the development of scientific and business contacts with Lithuanian geologists, Professor E. Emelyanov was elected an honorary member of the Lithuanian Geological Society.

In the epilogue of one of his books he wrote: „Am I happy with what I’ve done in science? It’s hard for me to say. The others will say later. Am I happy? Yes, I’m happy. I went to work all my life, walking like a child, with a quiet song in my heart, like it is holiday waiting me. The smile was more common on my face than sadness or despair”.

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