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IN MEMORIAM
Farewell to Ph.D. Boris Winterhalter
(3 July 1939 – 7 July 2025)

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The Baltic Sea scientific community suffered a great loss. On 8 July 2025, a good friend and colleague, the eminent Finnish researcher and thinker, Ph.D. Boris Winterhalter, passed away at 86. This happened after a decade of serious health problems he had; however, despite that, he actively kept our scientific and public relations. He was the senior marine geology researcher (retired) at the Geological Survey of Finland (GSF) and former professor in marine geology at the University of Helsinki. As a member of the marine geology group, Espoo, Finland, Boris Winterhalter was responsible for developing marine geological and geophysical activities at GSF. He was a highly advanced charismatic person whose bright knowledge and friendship for many years joined marine geology surveyors around the Baltic Sea states. Boris Winterhalter research reported in more than 70 scientific articles and papers has focused on marine sediments' geochemistry and their formation, Late Quaternary stratigraphy, paleoenvironment and geological history of the Baltic Sea basin.

After scholar years, in early summer 1962, Boris, as a young alumnus, he boarded the Finnish research vessel *ARANDA* appointed for his first marine geological cruise led by the famous professor Ivar Hessland from the Geology Department of Stockholm University to the central part of the Baltic Sea. Another member of the scientific crew and also the first time on board was Tom Flodén from the same department as professor Hessland (Winterhalter 2016). This cruise had a great importance because it gave an opportunity for Boris and Tom to develop rapidly marine geology and geophysics at their departments. Later, during the seagoing years Boris and the *ARANDA* crew covered miles and miles surveying geological profiles in the Finnish waters, which found their respect in the scientific reports. However, Boris soon became involved in numerous international marine research collaborations and contributed significantly to field surveys, seafloor sampling campaigns, and the development of marine geological mapping techniques in the Nordic marine basins.

Boris Winterhalter (about 2011; from Internet archive*)

In 1972, Boris Winterhalter published his research results in a monograph, including three maps, entitled "On the Geology of the Bothnian Sea, an Epeiric Sea that Has Undergone Pleistocene Glaciation" (Winterhalter 1972). The monograph notes a great challenge in his scientific career and follows innovative achievements made in relation to everyday duties on the Baltic marine geology survey.

In 1981, Boris Winterhalter, together with Tom Flodén, Heikki Ignatius, Stefan Axberg and Lauri Niemisto, completed the fundamental chapter "Geology of the Baltic Sea" (Winterhalter *et al*. 1981), which was published in the prestigious monograph "The Baltic Sea" edited by Aarno Voipio. In this chapter, Boris presented an original description of the Baltic Sea's natural resources.

The running time required extending a circle of the Baltic Sea researchers, and in 1987 Boris Winterhalter took a new fruitful initiative to call an International Colloquium on the Baltic Sea Marine Geology that was held in Parainen, Finland, on 27–29 May 1987 (Winterhalter 1988). Around a dozen scientists took part in this remarkable event that gave the beginning of a regular biannual Baltic marine geology conference. It was important that the Special Paper of the Parainen meeting was published in 1988 by Geologian Tutkimuskeskus of Finland (Winterhalter 1988). Thus, until nowadays about 14 Baltic marine geology conferences have been organized in countries surrounding the Baltic Sea.

Other important point to be mentioned is Boris' participation in the fascinating project of two Antarctic oceanographic expeditions realised by Finnish Environmental Institute (SYKE) on board of a new, the third research vessel *ARANDA,* in 1989–1990 and 1995–1996. Well equipped for complex surveying and guided by a hard crew, the multipurpose ice strengthened R/V *ARANDA* has performed marine research likely involving sea ice drilling to collect oceanographic and geological data in the Eastern Weddell Sea. Boris often remembered about that far long cruises from Helsinki to Antarctic waters that highly enriched his scientific horizons.

In the 1990s, after the East-West wall collapse, the Eastern Baltic states got sovereignty over their territorial waters and turned on an European dimension in marine geosciences. New programs shaped the exploration of the Baltic Sea as a European marginal sea by teams of scientists previously separated by political boundaries. The BASYS project (Baltic Sea System Studies) deserves special mention here. Funded by the EU from 1996 to 1999, it investigated the Baltic Sea as a systemic unit using a multidisciplinary approach by various subprojects. Sub-project 7 focused on the investigation of Late-Quaternary, specifically Holocene, sediments in the central basins of the Baltic Sea. Using acoustic surveys and targeted sampling, the sediments were studied with regard to their lithostratigraphy and a high-resolution reconstruction of the paleo-environment, paying particular attention to climate change and anthropogenic impacts. Boris, as a highly respected expert in the Baltic scientific community, led this project (Winterhalter 2001), and the first coherently published results (Grigelis, Winterhalter 2001) were groundbreaking for further research. Of particular note are two expeditions with the R/V *PETR KOTTSOV* in 1996 and 1997, in which Boris participated as co-chief scientist, and which remain unforgettable for the members of the international research crew. During these expeditions, valuable sediment cores were obtained from the Eastern Gotland Basin, the Bornholm Basin, and the Northern Central Basin. These sediment cores, together with the collected research data, formed the basis for subsequent work on the stratigraphic subdivision of the Holocene in the central basins of the Baltic Sea (Harff *et al*. 2001, 2011) and on the reconstruction of the paleo-climate and its influence on prehistoric socio-economic development, especially the Neolithic Revolution in the Baltic region (Warden *et al.* 2017).

After leaving the FIMR, Boris Winterhalter remained active in science communication, writing blogs and participating in discussions on environmental issues, especially eutrophication and the human influence on climate change, which he viewed critically.

Prolific Finnish scientist B. Winterhalter was well known in marine geology community around the Baltic Sea states and beyond. As regards Lithuania he was well acquainted with Academician Vytautas Gudelis, and became a member of Editorial Committee of the international BALTICA edition established by V. Gudelis in 1961. B. Winterhalter wrote several papers for BALTICA and significantly served as referee of the editorial committee.

Let us cherish his memory with honor and gratitude.

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