



To: Atlantic Geoscience Society Awards Committee

5th January, 2025

Re: Distinguished Scientist Award (Gesner Medal) – nominating letter for Graham Williams

Graham Williams is an internationally renowned palynologist, prominent in the field of fossil dinoflagellate cysts (dinocysts), in which he was a key pioneer. He began his study of fossil dinoflagellates at the University of Sheffield in 1959, and his 1963 doctoral thesis was one of the first detailed studies of Paleogene dinocysts. The work was published as part of a major monograph (see Williams and Downie 1966) that is still extensively referenced and that established dinocysts as important stratigraphic index fossils.

After his graduation, Graham joined Pan American Petroleum (later Amoco Petroleum Company) in Tulsa. There he worked on the biostratigraphy of offshore eastern Canada. When, in 1971, the Geological Survey of Canada opened an eastern office, the Atlantic Geoscience Centre (now Geological Survey of Canada, Atlantic, or GSCA) in Dartmouth, Nova Scotia, Graham was a natural to become its first Mesozoic–Cenozoic palynostratigrapher.

During his early years at GSCA, Graham examined many wells and increased his knowledge of dinocyst biostratigraphy, culminating in a milestone GSC Paper reporting on the palynological zonation of 67 wells in offshore eastern Canada (Barss et al. 1979): of the 67 wells, Graham had analyzed 44. Graham was also the moving force behind several papers describing dinocysts and their stratigraphy in offshore eastern Canada (e.g. Williams 1975; Williams and Brideaux 1975). The importance of this and ongoing biostratigraphic work to the geology of offshore eastern Canada cannot be overemphasized: we have vanishingly few radiometric dates from Mesozoic–Cenozoic strata in the region, so the age control that we have through up to 20 km of strata is primarily due to biostratigraphy — and that in turn is disproportionately attributable to Graham’s work and influence.

In recent years Graham has continued to play a major role in the biostratigraphy of offshore eastern Canada, with published or Open File contributions on the Scotian Margin, offshore Newfoundland, and the Labrador–Baffin Seaway (e.g., Nøhr-Hansen et al. 2016), as well as onshore Bylot Island (e.g., Haggart et al. 2022).

Graham developed an early interest in conceptual aspects of dinocysts studies, publishing papers on dinoflagellate evolution, diversity through time, paleoprovincialism, and paleoenvironments. Throughout his career he has also been an avid proponent of the importance of taxonomy. In this vein, he began a collaboration with Judi Lentin in producing what has become the "Lentin and Williams" Index of fossil dinoflagellates (Lentin & Williams 1973 and eight subsequent editions, e.g., Williams et al. 2017). At last count the main part of “The Index” included 10,233 entries of generic and species names. This remarkable work is a primary reason why dinocyst taxonomy is



so organized compared to most other microfossil groups and is almost universally cited in works on dinocysts, either in its original format or as the database DINOFLAJ, which Graham has developed in collaboration with Andrew MacRae and me.

Graham's work has also included benchmark publications on general dinocyst biostratigraphy (e.g., Williams & Bujak 1985; and Williams et al, 2004, which focused on the Southern Ocean) and contributions to numerous workshops (e.g. Williams et al. 1999), through which he has mentored new generations of researchers internationally. Graham has also maintained a strong interest in dinoflagellate taxonomy, classification and evolution; for example, his insights led to a significant revision of the subfamily Wetzelielloideae (Williams et al. 2015). Graham's vital role in formulating the first detailed comprehensive phylogenetic classification of dinoflagellates (Fensome et al. 1993), still a standard reference, has more recently led to studies integrating the fossil record with molecular phylogenetic studies.

Graham has also contributed to several major publications in eastern Canadian geology. He co-edited a major volume on offshore eastern Canada in the Decade of North American Geology (DNAG) series (see Williams et al. 1990), which included a definitive overview of the biostratigraphy that he led. Graham was also senior editor of the "Lexicon of Canadian Stratigraphy" volume for the Atlantic Region (Williams et al. 1985), and he has also been deputy-editor of the Canadian Journal of Earth Sciences and co-editor of Atlantic Geology. Graham has also shared his expertise in multi-authored textbooks and other compendia (e.g., Williams 1977, 2018). He was also the primary instigator of a multi-authored textbook on palynology ("Palynology: principles and applications"), which he persuaded colleagues Jan Jansonius and Colin McGregor to edit (see Stover et al. 1996) (Graham has had a special talent for coming up with great ideas and persuading others to largely bring them to fruition).

Graham was a leading founder of the Atlantic Geoscience Society, to which he has made many significant contributions, such as promoting the first "geological highway map" of Nova Scotia, playing an integral role in the production of educational geoscience videos, as well as the EdGeo workshops for teachers in Nova Scotia. Perhaps his crowning achievement in outreach activities has been the production of two seminal books on Maritimes and Canadian geology. Graham mooted the idea of a "popular" book on Maritimes geology at the 1996 Colloquium in Antigonish, and thanks to his drive and leadership skills in gathering many contributors, the book *The Last Billion Years* became a reality in 2001. This success led to the larger undertaking to produce "Four Billion Years and Counting", a book on the geology of Canada (Fensome et al. 2014), and a second edition of *The Last Billion Years* (Williams et al. 2022).

Graham has always considered himself to be a member of the larger paleontological and geological community. Throughout his career he has contributed enormously to nurturing what was an emerging discipline, helping to shepherd it to a maturity as an essential component of sedimentary basin studies. This account gives only the highlights of his career; the details would fill many more pages. With prodigious energy and phenomenal power of concentration, he will work long days to finish his commitments, while always keeping a positive attitude and cheerful



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disposition. He has achieved excellence in every sense of the word, and his nomination for the Gesner Medal is surprising only in that it has been so long in coming.

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Key works (in chronological order)

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