

## OBITUARY

### Geoffrey Norris (1937–2023): a tribute

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**Figure 1.** Professor Geoffrey Norris PhD, FRSC (1937–2023) taken in 2003 as his departmental portrait.

Geoffrey Norris, Professor Emeritus of the University of Toronto and a former AASP President (Figure 1), passed away at home in Toronto on June 26, 2023 at the age of 86.

#### 1. Cambridge and New Zealand

Geoff was educated at the Royal Liberty School in Gidea Park, Romford, Essex, UK which was then a selective, traditional grammar school (Head and Wrenn 1992). From there he went up to Cambridge in 1956, being admitted to Gonville and Caius College where the famous stratigrapher W. Brian Harland (Wikipedia 2024) was his personal tutor. Geoff married Anne in 1958 and they started their family. He received his Bachelor of Arts degree (Cambridge does not grant BSc degrees) in 1959, his Master of Arts degree in 1962 (a seniority degree conferred by right on holders of the BA), and worked towards his PhD at Cambridge under the well-known palynologist Norman Hughes (Batten 1986). However, living on a student grant and with a family to support, they moved to Lower Hutt, New Zealand in

1961 where Geoff took up a position as a Scientific Officer in the Palaeobotany Section of the New Zealand Geological Survey. It was there he met Dave McIntyre (Figure 2), who became a lasting friend and an early coauthor (McIntyre and Norris 1964, 1966a, 1966b). With the low Survey salaries at that time and struggling to make ends meet, Geoff worked in his spare time at Griffin's biscuit factory. He also found time to finish his PhD under the external supervision of Sir Charles Fleming in 1964. Geoff enjoyed telling the story that upon award of his PhD he received a pay rise from the biscuit factory (a coincidence) but not the Survey. His thesis was entitled 'Upper Jurassic and Lower Cretaceous miospores and microplankton from southern England', representing one of the very early contributions to the study of Mesozoic dinoflagellate cysts.

#### 2. North America

In 1964, the family moved to North America, initially to Hamilton, Ontario, Canada, where Geoff took up a post-

**Figure 2.** Geoff with his New Zealand Geological Survey 'family', taken at the IX International Palynological Congress in Houston, Texas 1996. Left to right: Graeme Wilson, Dave Pocknall, Dave McIntyre, Dallas Mildenhall, and Geoff Norris. Photo supplied by Dave Pocknall.

doctoral position at McMaster University. He recalled sending Dave McIntyre a Sears catalogue showcasing the high standard of living in North America in contrast with New Zealand, prompting Dave's immediate relocation to Canada in 1965. That same year, Geoff joined Pan-American Petroleum at Tulsa, Oklahoma as a Senior Research Scientist in their Geological Research Department where he developed a life-long interest in the application of palynostratigraphy to the oil industry. He joined the Geology Department at the University of Toronto as an Assistant Professor (with tenure) in 1967, having bargained on tenure rather than salary. This was fortuitous because the then Chair, Prof. Leslie Nuffield, was hostile to soft rock geology in general and paleontology in particular, and Geoff may not otherwise have survived. He climbed rapidly through the ranks to Associate Professor in 1968, and Professor in 1976. Geoff served as Chair of his Department from 1980 to 1990 during which time he oversaw the department's move from its antiquated home in the old Mining Building to spacious purpose-built facilities in the new Earth Sciences Centre, meticulously ensuring that the design of this new centre would meet all faculty research and teaching needs.

Geoff had a sharp mind and was an effortless communicator. He enjoyed talking to people, had a tremendous sense of humor, which helped in his dealings with the university administration, and he delighted in the ironies of life. He was

a regular attendee at AASP Annual Meetings (Figure 3), organized the third annual AASP meeting in Toronto in 1970, and was a highly effective chair of committees. Among his many roles, he served as President of AASP (1971–1972), Secretary-Treasurer of the International Commission for Palynology (1976–1980), and President of the Canadian Association of Palynologists (1982). He was admitted as a Fellow of the Royal Society of Canada (the nation's most prestigious scientific academy) in 1983 and served as its Director of the Division of Earth, Ocean and Atmospheric Sciences from 1993 to 1996. His superior grantsmanship enabled him to support an active research group through much of his academic career.

Geoff was highly regarded for his research in the areas of palynology, taxonomy and biostratigraphy. As a pioneer in the early study of fossil dinoflagellates, he contributed significantly to their modern understanding as vital tools in biostratigraphy and paleoenvironmental analysis. Geoff's publication record includes important early contributions on dinoflagellate cyst morphology and systematics, and he was first to document convincingly in Jurassic dinoflagellate cysts those features that were later called epicystal/epittractal archeopyles (Norris 1965a). With Dick Hedlund, he went on to describe transapical archeopyle sutures in Cretaceous dinoflagellate cysts, proposing that they represented a dinoflagellate lineage which was to invade freshwater

**Figure 3.** Geoff Norris with fellow Past Presidents and President of the American Association of Stratigraphic Palynologists, taken at the 36th Annual Meeting in St. Catharines, Ontario, Canada, 2003. Standing left to right: John Wrenn, Fred Rich, Doug Nichols, Dave Pocknall, Reed Wicander, and Jim Riding (then President); seated left to right: Geoff Norris, Jan Jansonius, Al Traverse, Bob Clarke, and Don Benson. Photo: another Past-President, Vaughn M. Bryant, Jr.

environments in the Cenozoic (Norris and Hedlund 1972). Following a useful early compilation of fossil dinoflagellate genera (Norris and Sarjeant 1965), Geoff went on to propose a dinoflagellate suprageneric classification (Norris 1978a, 1978b; Artzner et al. 1979) at a time when such schemes were considered impractical. He pursued this research with others, most notably one of his research associates, Rob Fensome. This led to the now classic and universally embraced 1993 publication (Fensome et al. 1993) that integrates the taxonomy and classification of fossil dinoflagellates with their living relatives.

Geoff published extensively also on Mesozoic and Cenozoic spores and pollen as well as marine palynofloras from Antarctica (Gair et al. 1965; Norris 1965b), New Zealand (Norris 1962, 1968; McIntyre and Norris 1966a, 1966b; Norris and Waterhouse 1970; Harris and Norris 1972; Waterhouse and Norris 1972), China (Mao and Norris 1988; Shu and Norris 1988, 1999), southern England (Norris 1969, 1970, 1985) and north-west Europe (Dorhofer and Norris 1976; Norris and Dorhofer 1976), the United States (Norris and Hedlund 1968; Davies and Norris 1976; Hedlund and Norris 1986), western Canada (Norris 1967; Jarzen and Norris 1975; Norris et al. 1975), and southern Ontario (Burden et al. 1986a, 1986b). A particular focus was on

the Cenozoic of the Canadian Arctic (Harland et al. 1980; Norris 1982a, 1986, 1997; Sepulveda and Norris 1982; Norris and Miall 1984; Parsons and Norris 1999, as well as Davies (1983) which was supervised by Geoff). All these studies dealt variously with taxonomy, biostratigraphy, paleoclimatic interpretation, and integration with the existing geological framework.

Geoff's sustained research on the Mesozoic palynology and geology of the Moose River Basin, northern Ontario (Norris et al. 1976; Norris 1977, 1982b; Legault and Norris 1982; Telford et al. 1991) deserves special mention and was continued by one of his PhD students, Pierre Zippi (Zippi 1998). Geoff also co-authored with colleague Jock McAndrews the highly cited and still standard guide 'Quaternary Pollen and Spores of the Great Lakes Region' (McAndrews et al. 1973). With Jock, he also published an important study of freshwater dinoflagellate cysts from post-glacial lake muds of Minnesota, USA (Norris and McAndrews 1970).

Together with his research associate Martin Head, Geoff also contributed significantly to the Deep Sea Drilling Project and the Ocean Drilling Program (Head and Norris 1989, 2003; Head et al. 1989a, 1989b, 1989c), and also to pioneering research on Neogene dinoflagellates of the Atlantic coastal plain undertaken by his PhD student Laurent de Verteuil (de

**Figure 4.** Geoff Norris with colleagues during fieldwork to examine the contact between the Cogollo Group and the La Luna Formation at Cantera La Luna, Perija, Venezuela in 1991. Left to right: Omar Colmenares, Izaskun Azpiritxaga Badiola, Geoff Norris, John Moody, and Jhonny Casas. Photo: Jhonny Casas.

Verteuil and Norris 1992, 1996a, 1996b, 1996c). Geoff's interests were broad in stratigraphic range and global in scope. Over a lengthy career, Geoff inspired and mentored many students, postdocs and visiting scientists with his enthusiasm and innovative ideas. Rob Fensome recalls that even during his time as an administrator, Geoff would check in with his post-docs and students several times a week, his characteristic chuckle in passing conversation often heralding his approach down the hallway.

In 1975, Geoff was an Alexander von Humboldt fellow at the Universität zu Köln in Germany where he collaborated with Ulrich Jux on the fine wall structure of selected Upper Jurassic dinoflagellate cysts using transmission electron microscopy (Norris and Jux 1984). Other overseas activities included several visiting lectureships in China, and a sabbatical research stay at the Florida Bureau of Marine Research with Karen Steidinger during which he generously invited Pierre Zippi and Martin Head to spend a week helping with fieldwork.

### 3. Venezuela

Geoff had a long association with Venezuela, beginning with his PhD student Armando Fasola who, upon graduating in 1982, found employment with Intevep, S.A., the Venezuelan Institute of Petroleum Technology which was a subsidiary of Petroleos de Venezuela – PDVSA. Through Armando, dinoflagellate cysts became a valued tool in the Venezuelan oil industry, and this eventually led to Omar Colmenares receiving industry funding in 1990 to work with Geoff for a PhD

on the palynology of the Lower Cretaceous Cogollo Group in western Venezuela. Geoff (with his wife Anne) travelled to Venezuela in 1991 to undertake field work in western Venezuela. It was an intensive summer moving around Cogollo Group outcrops in the Tachira, Merida and Zulia states (Figure 4). There he and Anne became acquainted with the local cuisine, including a heavy vegetable and beef tripe stew called Mondongo, as well as Arepas and the typical Venezuelan dish Pabellón, which they loved. Geoff returned to Venezuela on sabbatical leave between 1992 and 1993, working with Maraven, S.A., a subsidiary of PDVSA, in helping to train the late Venezuelan geologist Miguel Velazquez. They completed a comprehensive Mesozoic–Cenozoic dinoflagellate catalog based on the extensive palynology collection of Maraven, S.A. from their exploration and production areas.

### 4. Consulting and beyond

Especially later in his career, Geoff consulted independently through his own company Rosalex and for both Biostratigraphy.com, LLC run by former student Pierre Zippi and for the IRF Group (IRF *iɪh* 'I'd rather fish') led by Dave Goodman, these organizations providing paleoenvironmental and biostratigraphic information to the petroleum industry. For some years Geoff was active in supporting exploration work in the sub-salt plays in the Gulf of Mexico. He would talk enthusiastically about the complex structures and stratigraphy, hidden from seismic analysis beneath the thick Louann salt, that the drilling projects were exploring and

that added significant reserves to the already highly productive Gulf petroleum province. Owing to industry confidentiality he was unable to publish this work. Geoff retired from the University of Toronto at the end of June 2003, becoming an emeritus professor.

Geoff continued to consult until he was 78, when work dried up with the drop in oil prices. He then turned to blogging about environmental issues. He and Anne would spend summers at their apartment in Florida, and Geoff became very concerned about rising sea levels, drainage of large areas of the Everglades by the all-powerful sugar cane industry, the spread of *Karenia* harmful algal blooms offshore, and of cyanobacterial blooms through Florida's waterways. He published a political analysis of Donald Trump (Norris 2016) which is as relevant now as it was then. To quote Geoff, 'The best thing about being retired is that you can stick your neck out, and no one can cut it off to any great effect!'

## 5. Students and associates

Geoff's students and visiting professionals were numerous and hailed from around the world. His PhD students, with their year of graduation, were: David M. Jarzen (1973), Edward H. Davies (1979), Armando Fasola (1982), Silvana de Gasparis (1985), Pierre A. Zippi (1992), Omar A. Colmenares (1994), Laurent de Verteuil (1995), M. Grace Parsons (2000), and Kevin E. Gostlin (2006 co-supervised with Desmond Collins). His MSc students were: Beatrice V. Awai-Thorne (1971), Elliott Burden (1978), Peter W. Hoyer (1979), Carolyn E. Anstey (1992, co-supervised with Martin J. Head), and Stanislav M. Kolev (1994, co-supervised with Martin J. Head). Geoff's postdocs, research associates, and other visitors were as follows: Gunter Dörhöfer (1975–1977), Robert A. Fensome (1981–1984), Shao-Zhi Mao (1981–1983), Martin J. Head (1985–1999), Michael Melchin (1987–1988), Ouyang Shu (1988–1989), Laurent de Verteuil (1995–1996), and Grace Parsons (1999–2011). Many of these students and associates went on to forge or continue their own successful careers.

## 6. Final reflections

Barrie Dale remembers Geoff as follows: 'He was one of a few valued colleagues who were important in transferring information between industry and academia, as the potential for dinoflagellate cysts in biostratigraphy emerged in the late 1960s and 1970s. He followed, and contributed to, the academic side of dinoflagellate cyst palynology while also doing consulting work for industry, giving him the perspective to address both sides of an exciting new field. Early AASP meetings provided a main forum for sharing such experience, and Geoff contributed freely with regular presentations, including active participation in the all-important late-night, high-octane, "back-room" discussions. He, and those free-spirited scientific exchanges, will be greatly missed'.

As a humanist, as Pierre Zippi noted: 'Geoff recognized that all those he mentored would take different paths to reach their full potential, and he allowed his students the latitude to find their own way'.

Geoff is survived by his wife Anne and his children Grant, Brett, Sonia, and Theresa. He has left a rich legacy of research, teaching, and administrative service; he long remained in contact with many of his former students and associates who were often invited to the family cottage on Christian Island in Georgian Bay on Lake Huron. His scientific interests were unusually broad and deep, but he was as fascinated by people as he was in science. He had a quick and incisive mind and could intuitively size up complex problems. All these qualities made him an outstanding mentor. He will be remembered for these things but also for his warmth, kindness, generosity, irreverent sense of humor, and infectious laugh.

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## Disclosure statement

No potential conflict of interest was reported by the author(s).

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