

Professor S. George Pemberton Ph.D, P.Geol., F.R.S.C.
(Dec. 3, 1948 – Aug. 4, 2018)

Dr. Stuart George (George) Pemberton passed away unexpectedly August 04, 2018, after battling illness for several years. George is survived by his wife Teresa, his daughters Sarah and Erin, and his son Joshua, a family to which he was utterly devoted. In discussions with him regarding life, family and his pursuit of science, George would smile and talk of a life well lived. He confided to many of those close to him that as a young man, he never expected to live so full and satisfying a life. To him, his family was all, and he was ever so generous as to include the students he mentored into that privileged space.

George was born Dec. 3, 1948 in Preston, Lancashire, England, by his account in a flat above a pub, to Ethel Mary Pemberton and George Edgar Pemberton. He emigrated to Canada with his family in 1950 and became a Canadian citizen in 1958. George completed a BSc. (Honours) in Geology at Queen's University in Kingston, Ontario in 1972, and a MSc. in Geology and a Ph.D in Geology at McMaster University in Hamilton, Ontario, in 1976 and 1979, respectively. He married Teresa Lynn (*née* Joyce) Pemberton on March 4, 1978 in Hamilton,



before packing everything they owned and moving to Athens, Georgia, USA to take up an academic posting at the University of Georgia. George started as a temporary visiting instructor (1978-1979) in the Department of Geology, and later was hired as an Assistant Professor (1979-1981). There, he received both the Teacher of the Year Award (1979-1980) and Professor of the Year Award (1980-1981) in the Department of Geology, voted by the undergraduate students and graduate students, respectively. George accepted the offer of a position at the University of Georgia in order to work closely with two of his scientific idols – Dr. Robert W. Frey and Dr. James D. Howard. He regarded his collaboration with Bob Frey to be one of the highlights of his career, and he developed a close friendship with him until Bob's death in 1992.

George returned to Canada in 1981 to take up a post as an Assistant Research Officer (1981-1982) and later, Associate Research Officer (1983-1984) at the Alberta Research Council in Edmonton, Alberta. His desire, however, was to be an educator and supervise graduate student research. He left the research council in 1984 when an academic posting was offered at the University of Alberta, also in Edmonton. There, he took up the position of Associate Professor from 1984 - 1987, and was promoted to Professor in 1987. During his time as Professor, he held a Canada Tier 1 Research Chair in Petroleum Geology (2002-2009), was elevated to Distinguished University Professor (2009), the highest level the U of A offers to academic faculty, and held the C.R. Stelck Chair in Petroleum Geology from 2013 until his passing.

George served as a Visiting Professor at the University of Copenhagen (1984), the University of Reading (1991), the University of Brunei Darussalam (2003), and the Universidad Venezolana de los Hidrocarburos PDVSA Exploración y Producción INTEVEP Los Teques, Venezuela (2011, 2012, 2013). He was a visiting scientist at Exxon Production Research at Houston, Texas (1992), Arco Alaska, Anchorage, Alaska (1998), Shell Canada, Calgary, Alberta (2002) and B.P. Trinidad, Port of Spain, Trinidad (2004).

George the Research Scientist

Together with Dr. Robert Frey, George co-founded the journal *Ichnos*, an international journal focused on organism-substrate relationships published by Taylor and Francis. It is the official journal of the International Ichnological Association. George served as its co-editor from its founding until his death.

George's interest in ichnology quickly became focused on making it both applicable and accessible to the broader sedimentological community. At a time when ichnology was largely regarded, even by paleontologists, to be a fringe discipline pursued only in the absence of "real" fossils, George saw an untapped resource that could impart profound insights into paleoenvironmental interpretations. While many of his contemporaries asserted that he was wasting his time trying to apply ichnology to subsurface (core) datasets, George was adamant that core could be employed effectively and very quickly he was able to erect criteria for recognizing a large number of ichnogenera. Indeed, there is hardly a core facility around the world today that does not have scientists in it using one version or another of George's famous trace fossil atlas.

He set out to train young sedimentologists to identify trace fossils and employ them as "biogenic sedimentary structures" in order to better interpret sedimentary facies and recognize stratigraphic discontinuities. He often reminisced about those early days, pointing out that challenge of securing research funds from oil companies in order to support his graduate students. He would say "I'd go to an oil company and try to tell them that by studying worm burrows they would find more oil ..." and then, adopting his best W.C. Fields impersonation, would quip that the company would reply "... move along son, you're attracting flies"! What a testament to his vision that today, the integrating of ichnology with facies analysis is considered essential to a thorough treatment of sedimentary successions. Indeed, over his career, George attracted nearly \$18 million in funding, nearly \$2 million of it provided by oil companies. George's seminal contributions are directly responsible for the presence of the world-leading ichnological community that exists in Canada today. At the time of his death, George had some 250 scientific publications, with more than 13,000 citations, a h-index of 60, and an i-10 index of 176. To say that his work is widely used is an understatement.

Beyond placing ichnology into the hands of sedimentologists and subsurface analysts, George was seminal in recognizing brackish-water trace fossil associations (1982), identifying and naming two new ichnofacies (*i.e.*, *Psilonichnus* Ichnofacies [1987] and *Teredolites* Ichnofacies [1984]), employing substrate-controlled omission suites to identify sequence stratigraphically important discontinuities (*e.g.*, *Glossifungites* Ichnofacies [1985]), discriminating deltaic ichnological signatures (1988), and characterizing the role of ichnology in porosity and permeability of hydrocarbon reservoirs (2005). He has fostered numerous other areas research.

George was also very interested in the contributions of historical figures in ichnology, sedimentology and stratigraphy, and he authored numerous manuscripts showcasing their work and impact on the scientific community. To his mind, recognizing and appreciating that which had come before was the evidence of true scholarship. Woe be to any doctoral candidate during their candidacy exam, should George be on their committee and they be ignorant of their disciplines' history!

George the Petroleum Geologist

During his career, George undertook extensive outcrop and subsurface fieldwork, particularly in Alberta. His emphasis was on Cretaceous reservoirs in both conventional oil and gas fields and oil sands deposits. In addition, however, he also conducted research into many major frontier

basins, including offshore Newfoundland (Hibernia, Terra Nova, Ben Nevis), the Beaufort Sea, the Mackenzie Delta (Taglu, Parsons Lake, Amauligak), and offshore Nova Scotia (Schubenacadie, Venture, Alma, Thebaud, Onandaga, North Triumph, and Glenelg).

Over his career, he imparted insights into the depositional environments, stratigraphy and biogenically influenced petrophysical properties of some of the major oil and gas reservoirs globally, including those of Alaska and mainland U.S.A., Algeria, Angola, Argentina, Australia, Brazil, Brunei, Chad, China, Colombia, Denmark, Egypt, Indonesia, India, Japan, Kazakhstan, Kuwait, Libya, Malaysia, New Zealand, Norwegian North Sea, Papua New Guinea, Peru, Qatar, Russia, Saudi Arabia, Taiwan, Trinidad, UK North Sea, Venezuela. His teaching and applied research reached virtually every major oil company on Earth.

George the Educator

George Pemberton was a paragon educator and mentor. During his time at the University of Alberta, he mentored numerous undergraduate honours theses, graduated 63 MSc. students, 16 PhD candidates and mentored 7 Post-Doctoral Fellows. Six of his doctoral candidates hold professorships in other universities. Through his 107 short courses to academic societies and the hydrocarbon industry, the number of undergraduate students and industry trainees he influenced during his career would be numbered are more than 3,000.

George was one of those rare people who led by example, and his many protégés have been inspired, by consequence, to high levels of personal achievement themselves. The qualities George brought to his research and training included creative identification of problems and their solutions, excellence in conducting and communicating research, applying first-principle approaches to interpretation, and approaching each day and each scientific challenge with vigor and passion. These qualities he instilled in his students at every level.

Anyone who had the pleasure of knowing George is aware that he stuttered. Rather than letting it hamper or impede him, it emboldened him instead to rise above it and, in fact, make it a distinctive part of his persona. George often spoke about refusing to allow his speech impediment to get in the way of his aspiration to be an educator, regardless of what others had told him growing up. The fact that George received so many awards as a teacher and mentor, rose through the ranks of professorship to a level few in his institution have achieved, gave countless lectures, short courses, and oral presentations at conferences, and supervised so many students is a testament to his turning what many regard to be a debilitating disability for an orator into a profound and disarming *ability*. Indeed, George would often joke to students that they had to pay close attention to what he said during lectures because he had a “distinctive Canadian accent”; blaming cold Canadian winters for making his teeth chatter! Nothing could break the ice faster than his infectious smile, boisterous laugh, and disarming acknowledgement of (but never apology for) his stuttering. Listening to George was a transfixing experience – one simply could not, *not* listen to him. He had a powerful voice and he delivered information and insights with a measured pace and cadence born out of his stutter that left you waiting in eager anticipation for his next words as he punctuated key points with clipped finality.

George Recognized by His Peers

George Pemberton was a Fellow of the Royal Society of Canada (F.R.S.C.), elected to that position in 2001. He was recognized for his scientific efforts through numerous national and international awards, most notable being a Distinguished Fellow of the Geological Association of Canada (1996), American Association of Petroleum Geologists Distinguished Lecturer (1998-1999), recipient of SEPM's R.C. Moore Medal for contributions in paleontology (2003), the Geological Association of Canada's Past President's Medal (Hutchison Medal) (1994), the American

Association of Petroleum Geologists' Grover E. Murray Distinguished Educator Award (2008), the Killam Award for Excellence in Mentoring (2009), the Canadian Society of Petroleum Geology Medal of Merit (2006), the Geological Association of Canada's Elkanah Billings Medal in Paleontology (2017), the R.J.W. Douglas Medal for outstanding contributions to sedimentary geology in Canada (2014), Honorary Membership in the Canadian Society of Petroleum Geology (2010), an elected Fellow of the Geological Society of America (2014), and recipient of the Geological Association of Canada's Logan Medal (that society's highest honour) (2013). George was to receive SEPM's Twenhofel Medal (that society's highest honour) in 2019 for his career contributions to sedimentary geology. Happily, he was apprised of this award before his passing.

Regardless of such international recognition of his contributions, George always held point of pride in the successes of his many graduate students, often quoting Henry Adams – *"A teacher affects eternity; he can never tell where his influence stops"*.

Farewell, George

George would often cite Bernard of Chartres, when speaking of his academic heroes – *"We are like dwarves perched on the shoulders of giants, and thus we are able to see more and farther than the latter. And this is not at all because of the acuteness of our sight or the stature of our body, but because we are carried aloft and elevated by the magnitude of the giants"*. George, of course, was far too humble to consider it so, but for those of us who knew him, respected him, and loved him, he WAS such a giant upon whose shoulders we stood perched – and standing there, we *do* see very far, indeed!

To honour George's legacy, donations can be made to the International Ichnological Association's *George Pemberton Scholarship*. Contact Dr. Erin Pemberton (erin.a.pemberton@gmail.com) or Dr. Gabriela Mángano (Dept. Geological Sciences, University of Saskatchewan, 114 Science Place, Saskatoon, SK, S7N 5E2, Canada) for further information.

Rest well, George – mentor, friend, and academic father. Your influence upon our lives is a treasure we will always carry. Your profound influence upon our science will never cease.

James A. MacEachern and Murray K. Gingras