

Memorial to Digby Johns McLaren (1919–2004)

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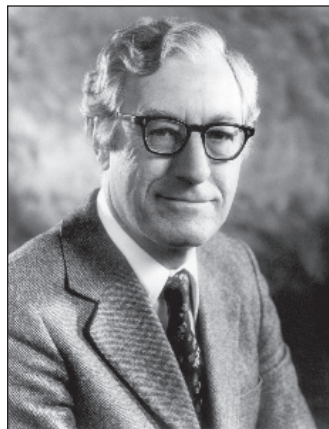
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Digby Johns McLaren, the 1981–1982 president of the Geological Society of America, died on 8 December 2004, in Ottawa. He was pre-deceased in 2003 by his wife of 61 years, Phyllis Mary (Matkin), and is survived by their sons Ian and Patrick and their daughter Alandra. Digby McLaren was a brilliant scientist and a visionary and inspiring leader within the Geological Survey of Canada, the Royal Society of Canada, and the Canadian, North American, and global geoscience communities.

Digby was born 11 December 1919 in Carrickfergus, County Antrim, Northern Ireland. He attended St. Mary's School, Roxburghshire, Scotland, and Sedbergh School, Yorkshire, England, before entering Queen's College, Cambridge University, where he received a B.A. natural sciences, part I, geology mineralogy, chemistry, in 1940. During World War II he served from 1940 to 1946 in the British Army, Royal Artillery. For 3½ years he experienced the human misery and horrors of war as an artillery officer in the Middle East and in Italy, where he participated in the battle for Ortona. His first scientific paper, published in 1946 (in Italian), was on local geology in the Italian province of Perugia. In 1948, he received an M.A. natural sciences, part II (first class honors), geology, paleontology, from Cambridge University. That year he joined the Paleontology Section of the Geological Survey of Canada (GSC) in Ottawa, and began his studies of the Devonian rocks of western Canada.

Digby McLaren was a remarkably gifted individual who had the good fortune to be in the right place at the right time. He arrived in Canada shortly after the unexpected 1947 discovery of a giant oil field in Upper Devonian stromatoporoid-coral reefs at Leduc, near Edmonton, Alberta, that launched the amazing growth of Canada's oil and gas industry and sparked intense interest in the Devonian stratigraphy of western Canada. His initial research assignment in the GSC was to "do the Devonian." He began by studying the superbly exposed Upper Devonian strata in the nearby Rocky Mountains that are laterally equivalent to the Leduc reefs. Digby quickly mastered the intricacies of Upper Devonian regional and local reef-margin stratigraphy and the taxonomy of the Upper Devonian fossil brachiopods and corals that helped to elucidate many important aspects of the nature, origin, and evolution of the petroleum resource system. With encouragement and support from the GSC, he was able to fulfill the requirements for a Ph.D. in geology and paleontology at the University of Michigan by 1951.

The scope of Digby's scientific experience expanded rapidly with his participation, in 1955, in Operation Franklin, a GSC aircraft-supported reconnaissance study of an immense area in Canada's western Arctic archipelago directed by the legendary Y.O. Fortier; and also, in 1957, with his involvement in Operation Mackenzie, a GSC helicopter-supported geological regional



mapping project in the Mackenzie Mountains of the Northwest Territories directed by another legendary GSC scientist R.J.W. "Bob" Douglas. Digby's research interests became focused on regional and global stratigraphic correlations and, in particular, on the abrupt mass extinction between the Frasnian and Famennian Stages of the Devonian. This extraordinary "event," recognizable around the world, was marked by the abrupt disappearance of the Frasnian reef ecosystem that was responsible for the generation and entrapment of the petroleum at Leduc. In his 1969 presidential address to the Paleontological Society, Digby's analysis of the available evidence led him to the conclusion that the most likely cause was an impact with a giant meteorite that disrupted the normal functioning of Earth's atmosphere, oceans, and biosphere. This was a controversial hypothesis. However, during the 1980s, skepticism waned because of the discovery of the widespread occurrence of anomalously high concentrations of platinum-group metals that provided convincing evidence of abnormally high global influx of meteoritic material in deep-sea sediments above the global extinction horizon at the Cretaceous-Tertiary boundary. Digby promptly organized and led a research project that demonstrated the occurrence of a similar platinum-group metal anomaly at the Frasnian-Famennian boundary in the Canning Basin in Australia. An ensuing review article on geology and the biological consequences of giant impacts, co-authored by Digby McLaren and W.D. Goodfellow, scrutinized the geological and geobiological evidence bearing on a meteorite impact origin for each of eight major extinctions that occurred during the last 500 million years of Earth's history; it was a major contribution toward the ongoing question of the role of impacts in the evolution of the biosphere.

Digby McLaren's research leadership and management talents were recognized early in his career at the GSC. In 1959, he was appointed head of the Paleontology Section of the GSC. By 1967, he had become the obvious choice as the first director of the GSC's newly established Institute of Sedimentary and Petroleum Geology in Calgary. This was another instance of the right person in the right place at the right time. At the Institute of Sedimentary and Petroleum Geology, Digby's managerial skills, visionary leadership, and international network of research colleagues in government and petroleum industry laboratories led to the development of innovative new research programs in petroleum geochemistry, coal geology, and the assessments of Canada's endowment of oil, gas and coal resources. Digby also led the expansion of GSC research in the western Arctic and the establishment of new collaborative links with the petroleum exploration industry and with the energy policy components of the Department of Energy, Mines and Resources. Digby's distinctive management style, enthusiasm, energy, curiosity, and interest in his staff instilled confidence and loyalty in all of them.

Digby returned to Ottawa in 1973 as 14th director-general of the Geological Survey of Canada. During the next seven years, with John Wheeler as his capable deputy and chief geologist, Digby skillfully guided the GSC through major modifications in the scientific range and geographic scope of its activities. The reconnaissance mapping of Canada was nearing completion, priorities had to be established for updated and more detailed mapping, and new demands and opportunities were emerging. There were concerns about environmental suitability of proposed natural gas pipeline routes from the Arctic, long-term management of high-level radioactive waste, and assessments of Canada's endowment of mineral and energy resources; there also were opportunities for expansion of marine geoscience surveys extending Canada's geoscience mapping into previously inaccessible areas, and for developing new mineral exploration technologies, including airborne radiometric surveys and geochemical surveys of lake and stream sediments. Digby's distinctive management style prevailed. He maintained communication and visibility in this much larger, more diverse, and geographically dispersed organization by convening management meetings at the GSC facilities in Dartmouth, Nova Scotia, Sidney, British Columbia, Calgary, and Vancouver, and by publishing the GSC newsletter *GEOGRAM*. He met regularly with an advisory committee from the Canadian Geoscience

Council that reported to senior officials in the Department of Energy, Mines, and Resources and informally to the public. In 1979, for these and his other achievements, he received the Gold Medal for Pure and Applied Science of The Professional Institute of The Public Service of Canada. In 1980, Digby retired as director-general to serve, until 1984, as senior science advisor in the Department of Energy, Mines, and Resources. From 1981 to 1984, he was visiting professor at the University of Ottawa.

While serving as director of the Institute in Calgary, Digby became active in extracurricular geoscience research and public policy activities, initially on a regional and national scale, but subsequently on an international scale. After serving as president of the Paleontological Society in 1969, in 1971 he became president of the Alberta Society of Petroleum Geologists, which soon thereafter became the Canadian Society of Petroleum Geologists. From 1968 to 1972, he chaired the Silurian-Devonian Boundary Working Group of the International Union of Geological Sciences Commission on Stratigraphy. Under his leadership, this working group negotiated the designation of the first “golden spike”—the Global Stratotype Section and Point that serves as a standard for the Devonian-Silurian boundary. From 1972 to 1976, he was chairman of the Commission on Stratigraphy, and under his leadership the Commission expanded in size and in the scope of its activities, creating many new working groups dedicated to the definition of Global Stratotype Sections and Points for other parts of Earth’s stratigraphic column. Three decades later, the importance of his contributions to stratigraphy and to the Commission on Stratigraphy of the International Union of Geological Sciences were commemorated with the establishment of the Digby J. McLaren Medal for international achievement in stratigraphy. When the medal was awarded for the first time in August 2004, at the 32nd International Geological Congress, in Florence, Italy, Digby, although in failing health, was able to be there.

In 1973, Digby was a founding member of the International Geological Correlation Programme, a very successful joint venture of the International Union of Geological Sciences and UNESCO that was aimed at fostering international collaboration, especially participation from developing countries, in research projects that require global integration of regional geological studies. An international peer review system, supported by a secretariat at UNESCO, solicited and identified successful proposals from multinational networks. It then provided seed funding, advice, and monitoring for approved projects that were funded mainly from national and/or foreign-aid sources. Digby McLaren served as president of the Board of the Programme from 1976 to 1980, then as advisor on earth science to UNESCO in 1981, and as a member of the Advisory Committee on Science and Technology in Society to the director-general of UNESCO from 1981 to 1983.

Digby McLaren’s concerns about the combined global threat of burgeoning growth in the human population and in profligate use of energy, mineral, water, land, and environmental resources were evident when he was director of the Institute of Sedimentary and Petroleum Geology in Calgary. However, population, resources, and the environment gradually became a consuming passion. Inspired by his experience on the UNESCO Advisory Committee on Science and Technology in Society, in 1983 Digby submitted, in collaboration with Professor Brian Skinner of Yale University, a proposal to the Dahlen Konferenzen in Berlin for a Dahlen Workshop on “Resource Dependence and Development: The Critical Years.” The objective was to examine the global resource base and the future resources demands of a rapidly growing human population. The outcome was two Dahlen workshops in 1986: one on mineral and energy resources, and the other on water and land resources, and also the book *Resources and World Development*.

On becoming president-elect of the Royal Society of Canada in 1987, Digby launched a program to reinvigorate the society. The need was urgent. A commitment of sustaining financial support received from the federal government through the research granting councils

was coming to an end. A new arrangement was required. Digby rallied the society during a series of visits with the fellowship that took him from St. John's, Newfoundland, to the Pacific Coast. Then, in Ottawa, he was successful in winning the support from the minister of state for science for a substantial increase in base funding to address new responsibilities for the society. With this vigorous start he was able, while president from 1988 to 1990, to conduct an energetic and ambitious campaign to transform the society into an effective national academy, responsible for providing expert information and advice for Canadian governments and society. The society generated new strategic, operational, and affirmative action plans, conducted a national study ("A Strategy for University Research in Canada") and established a Canadian Global Change Program that involved participation from the humanities and social sciences, as well as the natural sciences and engineering. This program was largely supported by grants from the Canadian national research granting councils and was linked to the International Geosphere-Biosphere Program of the International Council of Scientific Unions. With increased support from government, the society also launched a number of other programs such as Public Awareness of Science. Digby recognized that the society needed financial resources to carry out activities on its own initiative, and to that end, he stimulated a successful appeal for development funds. In a typical display of energetic enthusiasm, he produced, with Constance Mungall, the 1990 Royal Society of Canada book: *Planet Under Stress: The Challenge of Global Change* (also published as: *La terre en peril: metamorphose d'une planete*). Digby personally raised most of the funds needed for publication of the separate English and French editions.

Digby's perception of planet Earth as an evolving stable dynamic system involving continuous exchange among the atmosphere, oceans, lithosphere, and biosphere made him acutely aware that humankind, as a rapidly growing and increasingly powerful component of the biosphere, had already become a dominant geological agent of profound change and instability in the earth system. Deeply concerned about the future, he campaigned vigorously during the latter part of his life for political action to protect our planetary life support system. He wrote and lectured extensively on the threat to the health of the planet posed by the global environmental consequences of continuing rapid growth in the human population and in per capita resource consumption, particularly fossil fuel energy resource consumption. Pointing out that humankind was both the agent and the victim of an impending crisis, he stressed the need for prompt action, and he emphasized the immorality implicit in the fact the crisis arises mainly from the profligate actions of the wealthiest people, while the impacts fall most heavily on the poorest people.

Digby McLaren was a remarkable, multifaceted individual: an imposing figure of regal demeanor, formidably erudite and articulate as a defender of his scientific interpretations and their public policy implications; he was also an innovative practical joker, an aficionado of exotic orchids, an avid gardener, a connoisseur of good wine and gourmet meals, and an entertaining raconteur.

His many honors and awards include: Fellow of the Royal Society of Canada (1968); Corresponding Member, Société géologique de France (1973); Fellow of the Royal Society, London (1979); Foreign Associate, U.S. National Academy of Sciences (1979); Gold Medal for Pure and Applied Science, Professional Institute of the Public Service of Canada (1979); Fellow, American Association for the Advancement of Science (1980); D.Sc. (honorary), University of Ottawa, Ottawa, Canada, 1980; Leopold von Buch Medal and Honorary Member, Deutsche Geologische Gesellschaft, Germany (1982); Foreign Honorary Fellow, European Union of Geoscientists (1983); Edward Fitzgerald Coke Medal, The Geological Society, London (1985); Honorary Member, Canadian Society of Petroleum Geologists (1986); Logan Medal, Geological Association of Canada (1987); Officer of the Order of Canada (1987); Honorary Fellow, The Geological Society, London (1989); D.Sc. (honorary), Carleton University, Ottawa, Canada,

1993; D.Sc. (honorary), University of Waterloo, Waterloo Ontario, Canada, 1995; Life Member, European Academy of Sciences (2002).

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