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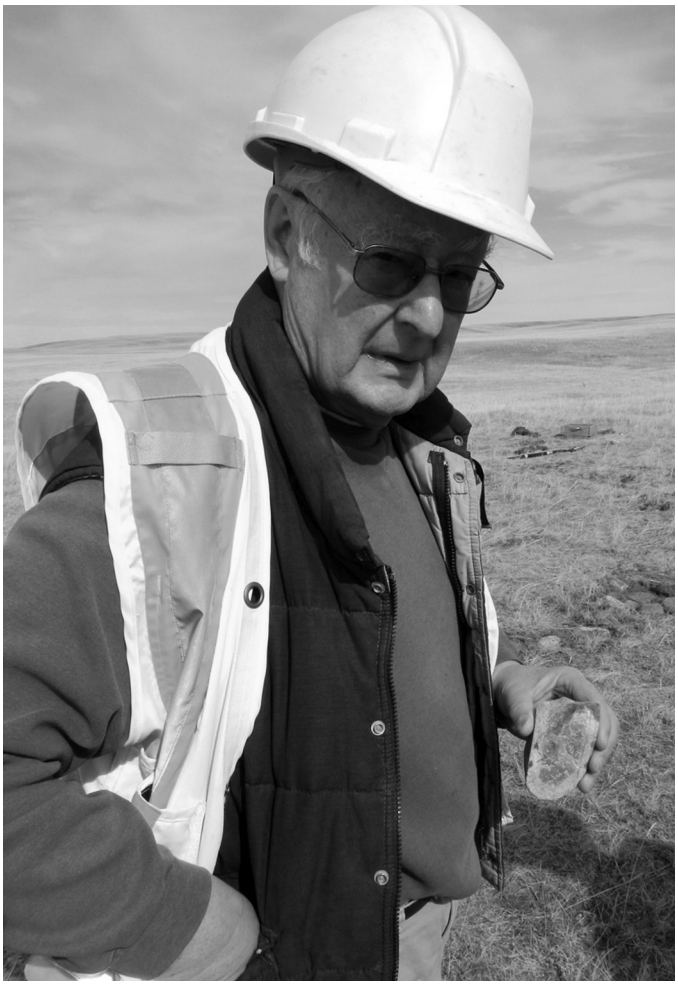
LEONARD VINCENT HILLS (1933–2013)

Leonard (Len) V. Hills was a palynologist and palaeontologist who enthusiastically pursued research, especially those studies that involved palaeoenvironmental interpretation. He was born in a log cabin at Judah, about 28 km south of Peace River, and raised in the rural Peace River district of west-central Alberta during the 1930s and 1940s. His formal education began in a one-room country school, but he finished high school in Peace River. After working several years for Mobil Oil Canada on a geophysical crew in southern Alberta, Len decided to further his education. At the University of British Columbia, he earned a BSc with honors (1960) in geology and archaeology, although early in his program he had seriously considered majoring in forest science rather than geology. His baccalaureate degree was quickly followed by a MSc (1962) from the University of British Columbia and a PhD (1965) from the University of Alberta, both in geology, with specialization in palynology.

After working briefly for Shell Oil in Edmonton, Len obtained an assistant professorship at the University of Calgary in 1966 and rose to the rank of full professor within eight years. Much of his university research involved compiling and interpreting ancient microfossil (and to a lesser extent, Holocene) pollen stratigraphic sequences, which seemed his favorite, but his work also included macrofossil and archaeological analyses. Although Len retired from his university position in 1996, he continued to conduct research, publish in peer-reviewed journals, and edit scientific documents. He also consulted for many years on numerous palaeontological impact assessment surveys for petroleum sites, pipelines, bridges, and road construction projects, which sometimes resulted in the recognition of archaeological resources. Len continued to supervise and mentor students in several faculties at the University of Calgary until a few weeks before his death in early August 2013, finally stopping not for lack of interest, but because of physical inability.

Len's professional career as a geologist began during his undergraduate program, when he did field work for the British Columbia Department of Mines (1957–58) and later for the Geological Survey of Canada in British Columbia and Quebec. In 1964, Len made his first trip to the Arctic, accompanying Geological Survey of Canada Arctic geologist Hans P. Trettin (Frisch, 2013) to study the Melville Island "tar sands" (Trettin and Hills, 1966), which included a trip to Bathurst Island. Despite what was likely a harsh environment and physically demanding circumstances during the excursion, this first Arctic experience must have been professionally rewarding, because Len returned at least five times from 1968 to 1975 and again in the early 1990s to conduct additional research. These trips included work on Banks, Queen Elizabeth, Meighan, Axel Heiberg, Ellesmere, and Prince Patrick Islands, where he described Devonian to Cretaceous stratigraphic sections within the Sverdrup basin (an important hydrocarbon source area) and collected samples for microfossil analysis. During the early years, microfossil sequences in Arctic bedrock formations were not well known.



Len Hills in the field, southern Alberta, in 2012. (Photo: Don Boras, Arrow Archaeology Ltd.).

In addition to stratigraphic work, Len and his students differentiated new microfossil taxa within recognized entities, identifying and naming ~50 new genera, species, and varieties of palynomorph. Not all of Len's research was restricted to microfossils. He, in association with other researchers, also recognized and named several previously unrecognized extinct macroflora: a spruce (*Picea banksii* Hills & Ogilvie), a walnut (*Juglans eocinerea* Hills & Sweet), an alder (*Paraalnipollenites confusus* Hills & Wallace), and a water fern (*Azolla geneseana* Hills & Weiner) that occurred in the present-day Arctic during a much warmer geological period. Over time, Len's primary attention gradually shifted from the Arctic southward to Yukon and the adjacent mainland portions of the Northwest Territories, into northern British Columbia, and eventually to southern Alberta, although he spent a great deal of time supervising students who conducted their thesis research in the Arctic and contributed to palaeontological studies conducted by others in the region.

Possibly as a result of the independence allowed by retirement, Len's research interests became more eclectic. They included topics related to Holocene plant and vegetation migration, reclassification of white × Engelmann spruce hybrids as a species for palaeoecological reasons, spring and fall population surveys of Trumpeter Swan migration for 20 years, and archaeological studies. The one study that has received the most public notoriety involved the interpretation of Holocene palaeontological, palaeoecological, and archaeological resources at the Wally's Beach site on the St. Mary Reservoir, southwest of Lethbridge, Alberta. Len began this research in the late 1990s, working primarily in conjunction with Drs. Brian Kooyman and Paul McNeil and with Shayne Tolman. So far the study has yielded some fascinating results. Findings include the occurrence of helmeted muskoxen and western camel bones, evidence of ancient horse and camel hunting and consumption by indigenous peoples, and the tracks of mammoth and other animals in the area about 13 000 calendar years ago, as well as some unusual artifacts. Another study that Len pursued with considerable interest related to the south-to-north Holocene movement of lodgepole pine (*Pinus contorta*) in southern Alberta and its possible migration from eastern British Columbia through Rocky Mountain passes into western Alberta, implying that Alberta lodgepole pine originated from two different Wisconsinan glacial refuge areas. He inferred this possibility from differences in seed-cone angle and orientation relative to the branch. This is a study that Len was not able to complete, and he would likely be very pleased for an eager graduate student to adopt it as a thesis and test his hypothesis.

Len was an author of more than 120 peer-reviewed scientific papers and related documents, in addition to numerous abstracts, presentations, and technical documents, and he had several journal papers in various stages of development and peer review at the time of his death. Another important scientific contribution, a catalogue of fossil spores and pollen, was compiled and published by Len and the late Dr. Jan Jansonius of the Geological Survey of Canada (Jansonius and Hills, 1976). Their initial compilation included 3287 taxa, but with periodic additions during the subsequent 26 years, it grew to a total of ~5500 taxa. A few years after the release of the initial version of their catalogue, Visscher (1980:164) at Utrecht University, Netherlands, described the compilation as "one of the major achievements in the history of pre-Quaternary palynology."

In addition to research and teaching duties during his 46-year association with the University of Calgary, Len served as the research supervisor for 52 graduate students and was a member of more than 270 additional supervisory committees, as well as working with many other graduate students in a less formal capacity. Outside the Geology (renamed Geosciences) Department, the committees he served on were primarily in Archaeology and Biological Sciences. In addition, he supervised more than 30 undergraduate honours theses. His encouraging attitude and always-constructive criticism was likely what made him a popular choice as a teacher and research supervisor. The University of Calgary's Graduate Student Association recognized the quality and long-standing dedication of Len to teaching and his mentorship in 1995, and he received the Order of the University of Calgary in 2003 for his distinguished service. Other professional tributes included the naming of an ancient maple (*Acer hillsi* Wolfe & Tanai), a scorpionfly-like insect (*Dinokanaga hillsi* Archibald), and planktonic foraminifera (*Hillsella hillsii* Georgescu) in his honor.

Len's more notable professional affiliations included being president of the Canadian Society of Petroleum Geologists (1979), a fellow of the Arctic Institute of North America for more than 30 years, faculty professor and professor emeritus in the Department of Geosciences and adjunct professor in the Faculty of Environmental Design at the University of Calgary, and adjunct research scientist with the Royal Tyrrell Museum in Drumheller, Alberta, Canada's only museum devoted entirely to palaeontology. Len was also proud of his long-time participation on the Northern Scientific Training Program awards committee (via the Arctic Institute of North America), which annually provides funding to students who conduct research in northern Canada. He also served as the editor for the *Bulletin of Canadian Petroleum Geology* (1968–73), *Arctic* (1978–82), and *Occasional Papers in Archaeology* published by the Archaeological Society of Alberta (2002–07), and he was co-editor of *Arctic*'s profile section (1988–96). As well, he edited several monographs, including a large volume entitled *Atlas of Pollen and Spores of the Poland Neogene* that he completed in late June 2013.

Len is survived by Marian, his wife of 53 years, daughter Maureen, son John, and four grandchildren. Dr. Leonard V. Hills' professional legacy will continue through his written words and ideas and mentoring of more than a generation of students, but his insight, his palaeontological and palaeoecological expertise, and especially his friendship will be greatly missed.

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