Leaders in Geotechnical Engineering

JOHN ANDREW ALLAN

John Allan studied geology at McGill University, receiving a B.A. in 1907 and a M.Sc. in 1908. He continued his studies at the Massachusetts Institute of Technology, completing a doctorate in 1912. He was sponsored by the Geological Survey of Canada who published his thesis on the Ice River intrusive complex. He was then appointed Professor and Chairman of the Geology Department at the University of Alberta, a position he held until his retirement 36 years later. He was also Chair of the Mining Department from 1914 to 1920.

Allan was a founding member of the Scientific and Industrial Research Council of Alberta. Heading the Geological Section allowed him to contribute to the development of the Province's natural resources. He mapped coal, oil, natural gas, salt and gypsum deposits and, in 1925, produced the first geological map of the Province. He advised on the development of hydroelectric projects in the Bow River drainage basin and on reducing risks around the Frank Slide. He also contributed geological interpretations to many of the Province's agricultural soils maps. Eighty scientific publications resulted, to which should be added 30 popular articles, bringing his new knowledge to a wider public.

Allan's abilities were recognized by the Association of Professional Engineers of Alberta; he was President in 1930. The Canadian Institute of Mining and Metallurgy gave him a similar honour. Elected a Fellow of the Royal Society of Canada, he served as President of the Geology Section in 1935. He was also a Fellow of the Geological Society of America and a founding member of the Alberta Society of Petroleum Geologists. Mt. Allan in the Kananaskis Valley commemorates his service to the Province.

Leaders in Geotechnical Engineering

INGE ANDERSON

In 1957, Inge Anderson earned a B.Sc. in Civil Engineering with Distinction from the University of Alberta. He also took post graduate courses in Soil Mechanics, Highway Engineering and River Engineering.

Anderson had a successful career in the planning, design, construction and safety of water infrastructure. He contributed to the establishment of the Alberta Dam Safety Program, and brought agencies across the country together to found the Canadian Dam Safety Association. Anderson served as the first President of CDSA and headed the committee that developed the Canadian Dam Safety Guidelines. CDSA became part of the Canadian Dam Association which still benefits from Anderson's involvement.

In recognition of Anderson's contributions, he was awarded a Fellowship by the Engineering Institute of Canada. CDA named its highest award the Inge Anderson Award of Merit in his honour.

Leaders in Geotechnical Engineering

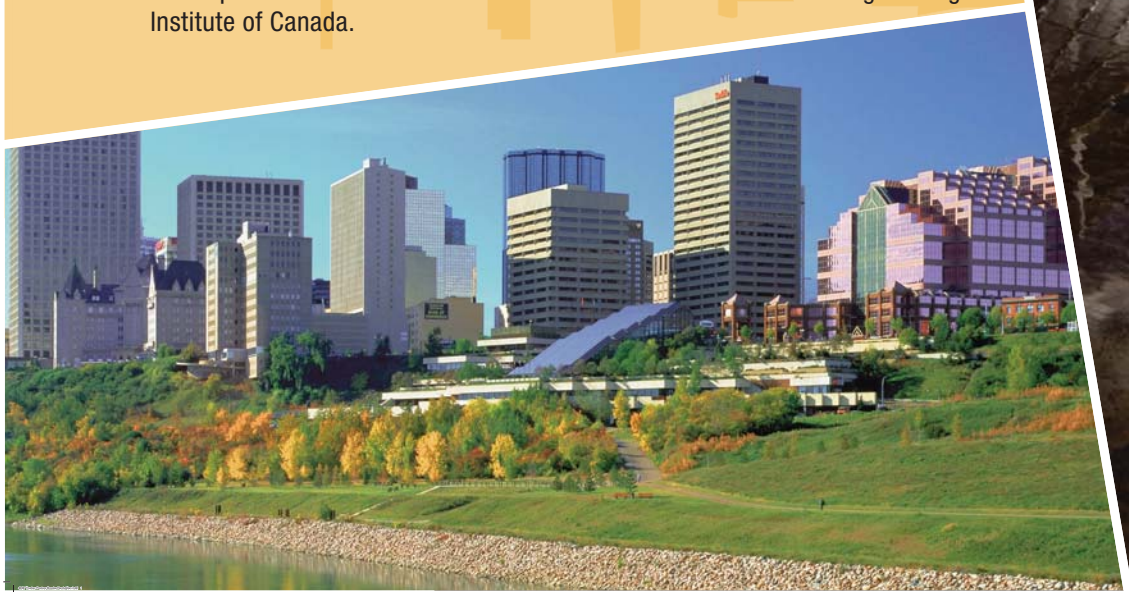
DR ELMER BROOKER

Elmer Brooker graduated with a degree in Civil Engineering from the University of Alberta in 1955. After completing a master's degree in soil and foundation engineering, he became a lecturer at the university. In 1960, he was the recipient of a Ford Foundation Grant, and entered a Ph.D. program in foundation engineering at the University of Illinois. After completion of his Ph.D., he returned to the University of Alberta as an Assistant Professor in the Civil Engineering Department. In 1966, Brooker's love of construction work led him to establish a consulting practice, Elmer Brooker & Associates, which later became EBA Engineering Consultants Ltd.

Initially the company offered consulting services to the Western Canadian resource industry, focusing on oil sands and permafrost. Brooker made key contributions during the formative years of the Syncrude project to the emerging technology of dragline mining of oil sands. EBA Engineering made significant contributions in arctic offshore petroleum exploration projects in both Canada and Alaska; through the 1970s and 1980s, the company completed numerous pipeline routing studies across the Northwest Territories.

Brooker was a prolific contributor to technical publications. His technical paper 'Rational Design Treatment of Slides in Overconsolidated Clays and Clay Shales', coauthored with Ralph B. Peck, is one of the most frequently referenced articles in the Canadian Geotechnical Journal. Brooker also led the management committee for the book 'Edmonton Beneath our Feet', published by the Alberta Geological Survey. Additionally, Brooker was an active volunteer throughout his career; his areas of service included terms as President of the Alberta Chamber of Resources, President of the Edmonton Chamber of Commerce, chair of the Alberta Laser Institute, and vice-chair of the University of Alberta Board of Governors.

The Geotechnical Society of Edmonton granted Brooker the Stan Thomson Award, in recognition of his contributions to the development and growth of the GSE and to geotechnical and geoenvironmental engineering in the Edmonton area. He was also the recipient of the Frank Spragins Award, which honours members of APEGGA for their integrity, expertise and outstanding accomplishments. Brooker has been inducted as a Fellow of the Engineering Institute of Canada.



Leaders in Geotechnical Engineering

ROBERT MACDONALD HARDY

Robert Hardy graduated as the Gold Medallist in Civil Engineering at the University of Manitoba in 1929. A year later he obtained a master's degree in Structural Engineering from McGill University and a Sessional Lectureship in the Faculty of Applied Sciences at the University of Alberta. A sabbatical year at Harvard in 1939-40 prepared Hardy to teach the new topic of Soil Mechanics. He introduced a new course, Design of Earth Structures, to the fourth year of the undergraduate program in 1943. In 1946 he launched the first master's degree program in Soil Mechanics in Canada. It offered theoretical, experimental, and case history courses related to the design of foundations, retaining walls, highways and airports. That year he was promoted to Professor of Civil Engineering, Chairman of the Department, and became the University's third Dean of the Faculty of Applied Science.

He retired from the university in 1971, having served 24 years as Dean. However, he continued his extensive consulting practice with R.M. Hardy & Associates Ltd. focussing on the problems of mining the Athabasca Oil Sands. These developments are now seen to be increasingly important to Canada's future.

His leadership was sought by the Association of Professional Engineers, Geologists, and Geophysicists of Alberta; he served as President in 1950, and as President of the Canadian Council of Professional Engineers in1952-53. His contributions to geotechnical engineering were recognized with the award of honorary doctorates from the University of Manitoba, Royal Military College, and the University of Alberta. The Engineering Institute of Canada elected him to Fellowship and subsequently bestowed both their Keefer and Julian C. Smith medals. Among numerous other awards were the CCPE Gold Medal and the Canadian Geotechnical Society's Legget Award. In 1974 he became an Officer of the Order of Canada and received the Alberta Achievement Award.

Leaders in Geotechnical Engineering

MURRAY HARRIS

Murray Harris graduated from the University of British Columbia in 1953 with a Bachelor of Science in Civil Engineering. Harris started his engineering practice with CP Rail in Western Canada, before moving to Saskatoon to work in consulting engineering. In 1964, he obtained a master's degree in Soil Mechanics and Foundation Engineering from the University of Alberta. Harris then moved to Vancouver where he worked on the design and construction of the W.A.C. Bennett Dam. In 1967 he returned to Edmonton to join R.M. Hardy and Associates; he worked on the Strathcona Refinery, Syncrude and Suncor Oil Sands Projects and the CN Tower in Edmonton. In 1978 he joined Thurber Engineering Ltd. as Chief Engineer. He led the firm as President and Chairman of the Board. Harris worked on the Redwater Fertilizer Plant, the Edmonton Synthetic Crude Facility, Sheerness and Genesee Thermal Power Plants, the Paddle River Dam and the LRT tunnels and stations in Edmonton.

Harris was one of the founding members of the Geotechnical Society of Edmonton. He served as President, and was the recipient of the Society's Stan Thomson Award in 1983. In 1985 he received the Frank Spragins Award, which honours members of APEGGA for their integrity, expertise and outstanding accomplishments. He was also a past member of the Soil Mechanics Subcommittee of National Research Council, and an associate editor of the Canadian Geotechnical Journal. Harris was also inducted as a Fellow of the Engineering Institute of Canada. Many consider his greatest legacy to be his mentoring and encouragement of young engineers.

Leaders in Geotechnical Engineering

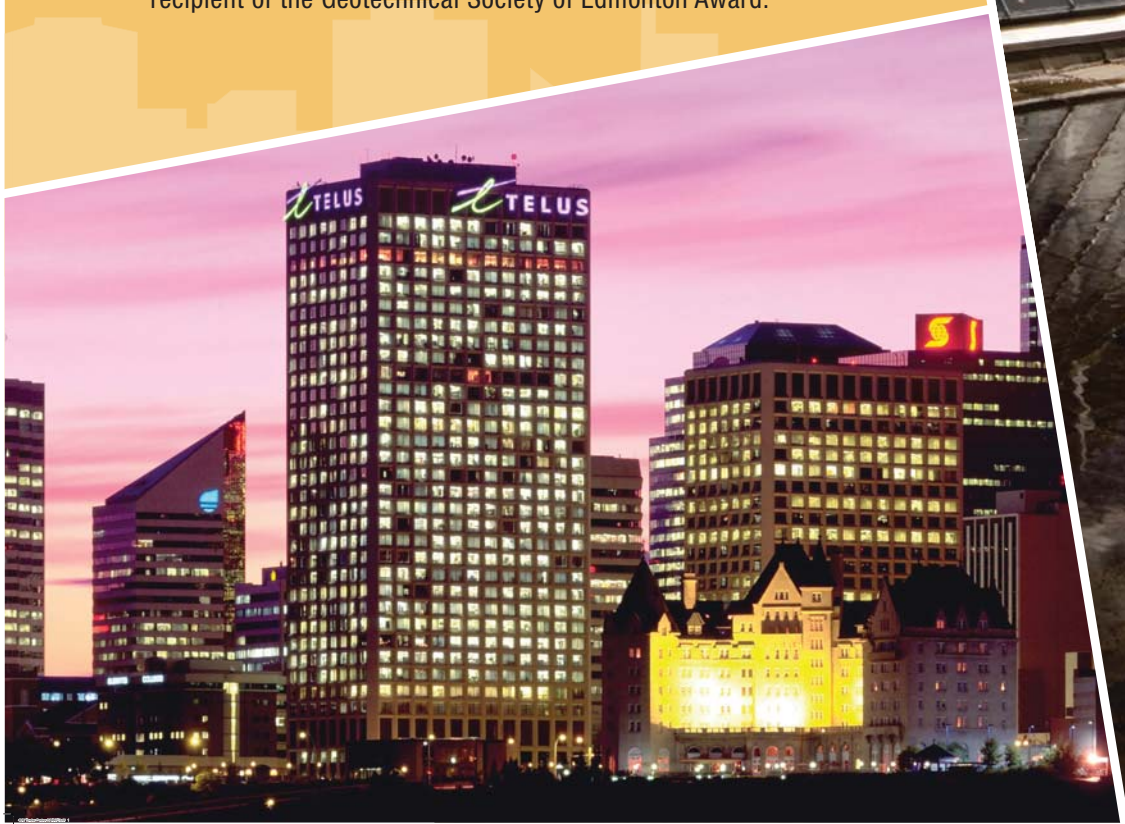
BILL JUBIEN

Bill Jubien received a degree in civil engineering from McGill University in 1956, and completed a Master's degree in soil Mechanics and Foundation Engineering at the University of Alberta in 1957. Following completion of his university studies, he worked with Ripley Klohn Leonoff until 1961 when he joined CN Rail in the position of Geotechnical Engineer. In 1969, Jubien moved to Edmonton to pioneer the challenging role of Senior Geotechnical Engineer for CN Western Canada, a position he held until 1996. He was responsible for all aspects of geotechnical engineering in support of CN railway operations between Vancouver, B.C. and Armstrong, Ontario.

During his years with CN, Jubien was involved in field inspection, prioritization of remedial work, and management of design and construction. The design work included development of new branch lines and upgrading of existing lines, as well as the ambitious double-tracking initiative undertaken by CN in the 1980s. Rapid response in emergency situation involving ground hazards was an essential component of his position.

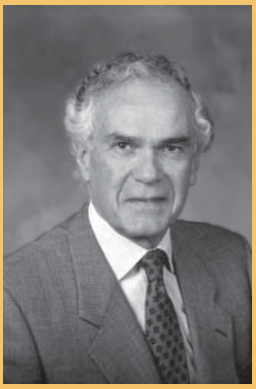
After his retirement from CN Rail in 1996, Jubien worked as a consultant to railways in the areas of geotechnical design and the development of solutions to maintenance problems. During 2002 and 2003, he served as lead witness for CN in a law case involving failure of a railway embankment in the Fraser Canyon. In 2008, his passion for the engineering profession led him to a position as senior review engineer with BGC Engineering. Jubien is renowned in the Canadian engineering community for his practical approach to problem solving.

Jubien served as CGS Director for Northern Alberta and the NWT and is recipient of the Geotechnical Society of Edmonton Award.



Leaders in Geotechnical Engineering

NORBERT REUBEN MORGENSTERN



After graduating in Civil Engineering from the University of Toronto in 1956, Norbert Morgenstern took up an Athlone Fellowship to study soil mechanics at the Imperial College of Science and Technology in London, UK. He was appointed a Lecturer there in 1960 and was awarded a Ph.D. by the University of London in 1964. In 1968, he became a Professor of Civil Engineering at the University of Alberta and a University Professor in 1983. He served as Chairman of the Department of Civil and Environmental Engineering from 1994 to 1997. He was appointed University Professor Emeritus in 1999.

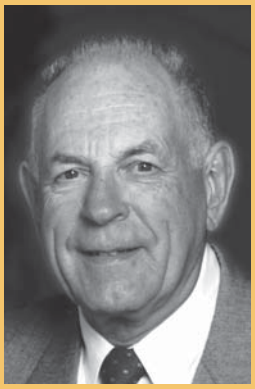
Morgenstern has made major contributions to the understanding of slope movements in submarine sediments, permanently frozen and seasonally thawing ground, locked sands, clay shales, residual soils and gassy sands. Beyond the initiation of these movements, he has analyzed the travel of flows of granular materials produced both by natural processes and by the liquefaction of mining wastes. These concerns developed into more general approaches to the management of risks from slope movements and to quantitative risk assessments.

After his 1981 Rankine Lecture to the British Geotechnical Society, it was said that "What is… impressive is that Morgenstern and his colleagues have focused their attention, and their research efforts on the major problems confronting the community within which they live, to the benefit not only of that community but others elsewhere. Surely this is the hallmark of a centre of engineering excellence. Furthermore, they have tackled these problems in a comprehensive way … developing new techniques in the laboratory and in the field and new analytical concepts."

His contributions have been recognized by honorary doctorates from Queen's University and Universities of Toronto and Alberta. He is a Fellow of the Royal Society of Canada, the Engineering Institute of Canada, the Canadian Academy of Engineering and of Academies in the USA, the UK, India, Japan and Peoples Republic of China. He has been awarded prizes by the British and Canadian Geotechnical Societies, the American Society of Civil Engineers, the Alberta Government and the Killam Foundation. He is a Member of the Alberta Order of Excellence and of the Order of Canada.

Leaders in Geotechnical Engineering

J. DONALD SCOTT



After graduating in Civil Engineering from Queen's University, Kingston in 1954, Don Scott joined R.M. Hardy & Associates Ltd. as a soil engineer in Kitimat, B.C. He continued his education at the University of Illinois (M. Sc., 1958, Ph.D., 1964) while on the faculty of the University of Waterloo. In 1966, he was appointed Professor of Civil Engineering and Chairman of the Department at the University of Ottawa. He returned to Hardy as a Principal Consultant and Associate in 1978, taking the AOSTRA Research Chair in Oil Sands at the University of Alberta in 1980 and becoming Professor Emeritus in 1993.

At the University of Alberta, he made fundamental contributions to understanding the behaviour of oil sands tailings. He developed laboratory facilities to study the long-term, large-strain consolidation of fine tailings. His numerical models predicting their behaviour have become industry standards. His segregation diagram, developed in 1984, synthesized segregation behaviour and led to the development of non-segregating tailings, now fundamental to modern tailings management schemes. He developed and operated a multi-million dollar research laboratory to examine the effects of the high temperatures and stresses produced in oil sands by the Steam Assisted Gravity Drainage process. He also initiated laboratory studies of geosynthetics to support research on geotextile filters and geogrid reinforced slopes.

Scott has authored 90 papers on geotechnical engineering, resource geomechanics, and geosynthetics. In addition to editing the first Canadian Foundation Manual, he coauthored 'Geotextile and Geomembrane International Information Source' with E. A. Richards. He was awarded the 1998 Syncrude Oil Sands Research Prize, an Alberta Science and Technology Leadership Award that honours significant contributions to science and technology in Alberta.

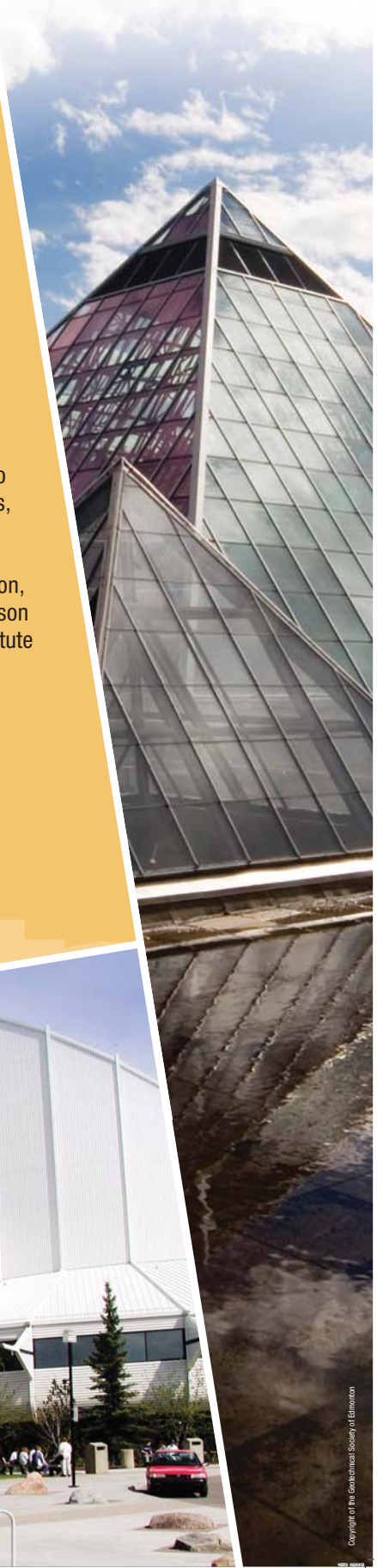
Leaders in Geotechnical Engineering

STANLEY THOMSON

After service as a bomb aimer for the RCAF during World War II, Stan Thomson studied Civil Engineering at the University of Toronto, graduating in 1950. He was recruited by the Royal Canadian Engineers in 1949; his 1954 posting as Soils Engineer for the Alaska Highway brought him into contact with R.M. Hardy. Their collaboration on the first tests of the shear strength of muskeg resulted in Thomson's M.Sc. thesis in 1955. He joined the University of Alberta staff in 1959 and was awarded the University's first doctorate in soil mechanics in 1963.

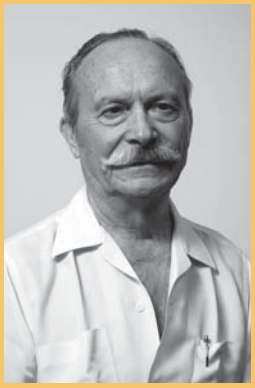
To his research interests in the North, Thomson added investigations of movements of river valley slopes throughout Alberta. Support for this work, from the Provincial Government and the Natural Sciences and Engineering Research Council, continued long past his formal retirement in 1984. Some of his contributions were to safety guidelines for valley slopes, a textbook of terrain analysis, the first synthesis of landsliding in Canada and guides to Edmonton's geology. His insights, published in eighty or more papers, continue to stimulate his many students and co-workers.

He was a founding member of the Geotechnical Society of Edmonton, his service recognized by the Society's creation of the Stan Thomson Service Award. In 1990, he was the recipient of the Engineering Institute of Canada's CPR medal.



JÓZSEF TÓTH

Leader in Hydrogeology



József Tóth studied geophysics for 4 1/2 years at the School of Mining and Geodesy in Sopron, Hungary, but left the country before graduating due to the Soviet invasion in 1956. He received an M.Sc. degree in geophysics and Ph.D. in hydrogeology from the State University of Utrecht, the Netherlands.

He spent twenty years at the Alberta Research Council as a hydrogeologist, twelve of which as Head of the Groundwater Department. In this capacity, he oversaw the scientific and technical activities of the Department, including a ten-year long hydrogeological mapping program covering the entire Province of Alberta. In 1980 he was named the Council's first Research Fellow.

Dr. Tóth introduced hydrogeology at the University of Alberta in 1966 and at the University of Calgary in 1978. He joined the Geology Department of the U. of A. as full professor in 1980. He taught there until his retirement as *professor emeritus* in 1996. He has presented courses and worked in various capacities in Australia, Brazil, France, Germany, Ghana, Italy, Holland, India, Kenya, Mexico, China, Spain, Sri Lanka, Switzerland, Thailand, the United Kingdom and the United States. He taught at the Eötvös Lóránd University in Hungary as *titular university professor* between 2005 and 2008.

Dr Tóth founded the Canadian National Chapter of the International Association of Hydrogeologists (IAH) in 1972 and served as its President until 1984. He was the Hydrogeologist Member of the Technical Advisory Committee to Atomic Energy of Canada Ltd between 1981-1985, and 1989-1996.

The focus of Tóth's research has been gravity-driven groundwater flow. His more than 90 publications have stimulated extensive research internationally on problems of soil salinization, eco-hydrology, slope stability, geothermal heat transport, transient flow on geologic time scales, radioactive waste-isolation, groundwater resources development, land-use planning and management, and petroleum hydrogeology. His *"scientific autobiography"*, a book on the topic, is currently being edited by Cambridge University Press for publication in early 2009.

Dr. Tóth's contributions have shifted basic paradigms, expanded the scope, and modified the definition of hydrogeology. For his work he has received numerous distinctions, including: the Geological Society of America's first O.E. Meinzer Award; the IAH's President's Award; the Prix Robert N. Farvolden Award of the Canadian Geotechnical Society; the National Ground Water Association's M. King Hubbert Science Award; the C.V. Theis Award of the American Institute of Hydrology. The Prix J. Tóth Award was established by the Canadian National Chapter of IAH for the "Best Student Paper in Canadian Hydrogeology - Meilleur article étudiant canadien en hydrogéologie".