

## HERITAGE

Heinrich Heinz, Heritage Editor



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In this article you will find two items:

1) an interview in the Canadian Legends Series (CLS) with **Don Shields**. It was conducted in January 2021 by **Prakriti Sharma** and **Jillian Usher** (introduced at the end of the article). The interview was facilitated by **Doug VanDine**, with the assistance of the CGS Heritage and Education committees. Other interviews in this series can be read at [www.cgs.ca/virtual\\_archives\\_legends.php](http://www.cgs.ca/virtual_archives_legends.php)

2) an update to the article on the geotechnical Athlone Fellows that appears in the Summer 2021 issue.

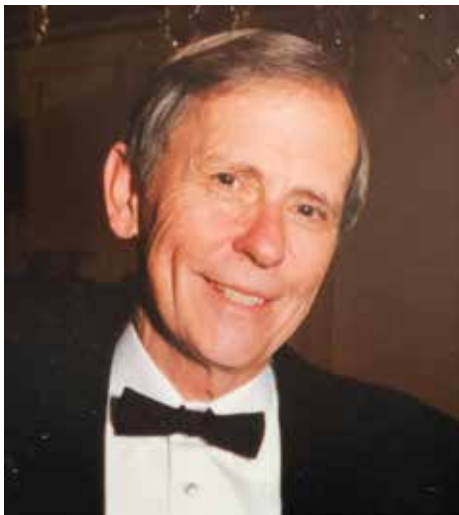
Regards, Heinrich

## INTERVIEW WITH CANADIAN LEGEND: DON SHIELDS

Prakriti Sharma and Jillian Usher

## BACKGROUND

**Don Shields** graduated as a civil engineer from the University of Saskatchewan in 1955. After graduating, he won an Athlone Fellowship that allowed him to study in England where he obtained a Diploma of Imperial College (DIC) in Soil Mechanics. Upon his return to Canada, Don alternated his career between consulting (both in BC and Ontario) and academia (universities of Ottawa and Manitoba), with a period at Manchester University to complete a PhD. In 1980, he became Head of Civil Engineering at the University of Manitoba and then Dean of Engineering. He retired with his wife, writer **Carol Shields** (1935-2003), in 2000 in Victoria, where he still resides with his second wife, **Arlette Baker**. Among other honours, Don is a CGS Robert F. Legget Medal recipient. He was the third President of the Canadian Geotechnical Society (1977-1978).



Don Shields

## INTERVIEW

**Prakriti Sharma and Jillian Usher for the CLS:** How did you first get into civil engineering, and then geotechnical engineering?

**Don Shields:** I grew up in a little town of 1500 or 2000 people—Kamsack, Saskatchewan—near the Manitoba border. My father worked for Canadian National as a boiler maker and repaired train engines, so I got to know quite a few train engineers. My high school had five rooms, 150 students and five staff. One day our teacher gave us a one-hour aptitude test and, based on the results of that test, I went home and told my mother that I had to be an accountant, architect or engineer. I knew what accountants and architects did, but I did not know what engineers did. So I thought maybe I should be an engineer. Off I went, at 17, to the University of Saskatchewan to study engineering. At university, my roommate was **Charlie Chernoff** from my hometown. Charlie was the best thing that ever happened to me. He was a serious student, and he and I were interested in somewhat the same things. Charlie decided he would be a geological engineer and I decided I would be a civil engineer. Working supportively with Charlie, I graduated with distinction. As an aside, for the first four or five years after I got married, I used to tell my wife that I had slept with Charlie Chernoff longer than I had slept with her!

During my university summers, I worked for Canadian National Railways as a surveyor, indirectly under the supervision of the famous **Major (John Leslie) Charles**. But that's a subject for another story. In the spring of my last year at university, I worked on a research project for my soil mechanics professor, Ben Torchinsky (see *Canadian Geotechnique*, September 2020), and that got me hooked on

soil mechanics. After university, I was awarded an Athlone Fellowship and spent a year studying soil mechanics at Imperial College in London (see *Canadian Geotechnique*, Summer 2021).



*Don Shields (right) and Peter Langeman (left), the two UofS Athlone Fellows in 1955*

**CLS:** Was there an area of research in geotechnical engineering that you focused on? Did your interests change over the years?

**DS:** In 1958, when I started working in Toronto with **Bill Trow** and **Larry Soderman** at Trow Soderman Associates, most of our work was associated with foundations, many of these for new bridges along the, then, new Trans-Canada Highway along the north shore of Lake Superior. It was then that I became interested in foundations on slopes. At that time **Geoff Meyerhof**, at the Technical University of Nova Scotia (now part of Dalhousie University) had developed a bearing capacity theory for slopes. I was a little concerned that his theory and his charts might over-predict the bearing capacity and hence be unsafe. So, in the early 1970s while at the University of Ottawa, I revisited the subject using large containers filled with 50 tons of sand (university staff called them “kitty litter boxes”). I then spent six months in France, where they had a large centrifuge. There I tested model footings on slopes and determined that only about half of Meyerhof’s charts were reliable. This agreed with my University of Ottawa results.



*Versailles, France during the banquet of the 5th ICSMFE in Paris, France, 1961. Clockwise from the lower left: Victor Milligan, Dave Townsend, Hugh Golder (forehead), Mrs. Golder, three unknown men, Carol Shields, Don Shields, unknown, Larry Soderman, and the Golders’ daughter*

In the mid-1970s, I returned to France for a year and studied various uses of the pressuremeter. The result was one of the first textbooks on the topic, *The Pressuremeter and Foundation Engineering*, by **François Baguelin**, **Jean Jézéquel**, and myself, published in 1978. While working for Hardy and Associates in Vancouver in the late 1970s, my interest in insitu testing was augmented through collaboration with Dick Campanella at the University of British Columbia, who at the time was conducting some of the first cone penetration tests in the deltaic deposits in Vancouver.

My interest in cone penetration testing had been whetted in 1976 when my French associate, **Jean Jézéquel**, was preparing world standards for the shape of the static cone. I was able to influence Jean to prepare a simple shape that could become an acceptable standard.

When I joined the University of Manitoba in 1980, **Len Domaschuk** was doing research on the use of thermal piles to keep permafrost frozen along railways and under buildings. I and my PhD students became interested in predicting the lateral capacity of piles in ice and permafrost using pressuremeter tests. **Branko Ladanyi** at L’École Polytechnique (now Polytechnique Montréal) was another person working in that area. Sometimes I proved him wrong, other times he proved me wrong, so it all worked out.

**CLS:** Having been involved with both industry and academia, how do you view the connection between the two?

**DS:** A good question because I was taught engineering when most civil profs came out of industry and many had worked with the Prairie Farm Rehabilitation Administration (PFRA) on real world projects, such as constructing dams. Only two or three of them had graduate degrees, but they were all excellent teachers and always referenced projects they had worked on. Over the years, as I got involved in academia, more and more of the professors came straight out of university with PhD’s, but with very little practical experience. Gradually, I realized that the best professors were always those who had practical industry experience, in addition to their PhD studies. I’m somewhat biased, but I believe that professors should have both a PhD and practical industry experience.

**CLS:** In your opinion, how important is a graduate degree for a geotechnical professional?

**DS:** I think undergraduate programs don’t include enough geotechnical subjects and, with some exceptions, those with just a bachelor’s degree are not as valuable in the consulting field. When I was in consulting, recent undergrads could be trained and employed in the field, but they were limited in terms of analyzing field and lab data, and report writing. In those situations, I would encourage and give some of our young professionals the opportunity to do graduate work.

I don't know about the necessity for a PhD though. Before I went to Manchester to do my PhD, I was a senior engineer at Trow Soderman Associates. For three years at Manchester I basically worked as a soils technician and no one has probably ever used my thesis for anything! (laugh)

**CLS:** What projects did you find most interesting during your career.?

**DS:** In 1978, I left the University of Ottawa and joined Hardy Associates in Vancouver at the prompting of **Jack Clark**, a senior engineer at Hardy (and the fellow that succeeded me as President of the CGS). At that time, Hardy got involved with what was to be the first uranium mine in BC—the Blizzard Mine. It was to be located on a mountain top across from Big White, near Kelowna. So, you could ski in the morning and carry out geotechnical investigations in the afternoon! I was responsible for designing the mine waste disposal, which included a tailings pond. The year before in Ottawa, I had helped **Donald Coates** (with the federal Mines Branch) teach a one-week course on mine waste disposal, so I knew a bit about the subject, but had no practical experience. To help us, we retained a chap from (US) Bureau of Mines who was an expert on mine waste disposal. The project was continuing nicely when the BC government decided that maybe uranium mining wasn't such a great idea. At a public hearing in Vancouver, we were invited to appear as experts before a panel. Every time we turned the lights out to show a slide and make a point, protesters at the back of the room, who had come dressed as cows, would press a button and their florescent "radioactive ribs" would flash in the dark. So, the panel members' attention was obviously diverted from us. The outcome was that BC decided to stop all uranium prospecting and development... stop everything. So overnight, our lovely project came to nothing.

Another interesting project I was involved with, also with Hardy Associates, was a mine development in Sumatra, Indonesia. My responsibility was to supervise the geotechnical investigations and design analyses to recommend how the proposed open pit mine would eventually reach a depth of 180 metres. For this project, we brought over Bob Hardy, the namesake of the company, for his expertise. Then again, this is the subject of a whole other story!



*Late 1970s, Sumatra, Indonesia. In white hats, left Don Shields; right Bob Hardy*

**CLS:** What is a common mistake that young geotechnical professionals make?

**DS:** I would say that, in general, geotechnical professionals should not rely entirely on the answers provided by their calculators and computers but think about the answers—the answers have to make sense!

**CLS:** Do you have any thoughts on diversity in the Canadian geotechnical profession?

**DS:** When I went to the University of Manitoba, the university was restricting the enrolment of international students to very few—I think it was 5% or something. Most first-year undergrads were from either Manitoba or northern Ontario. I encouraged the university to diversify its undergraduate enrolment, particularly international students who could bring different experiences and other points of view. On the other hand, we need more Canadian geotechnical graduate students.

I am so pleased to see more women in the profession. I think that's splendid.

**CLS:** What do you consider to be your finest career achievement?

**DS:** That's a good question. I think my finest achievement was the acceptance, the confidence and the support I received from my colleagues. Of all the many different things I did and accomplished, and the different directions I took in my career, that was the most rewarding.

**CLS:** What advice would you give young professionals starting their career?

**DS:** Professional relationships are extremely important. Never hesitate to introduce yourself. Look for iron rings on airplanes, in gatherings, and anywhere. You not only have



yourself to sell, but also the firm or organization for which you work. Attend professional and technical meetings and offer to help out. Do not be afraid to ask questions. Be confident in yourself and others.

**CLS:** How are you spending your retirement?

**DS:** Currently two colleagues and I in the United States are actively finding speakers to talk on US foreign policy for the Chappaqua (New York) library's foreign policy discussion group. We get along great and love it. We had a webinar yesterday! We get our moment in the sun when we introduce the speakers and ask questions.

In addition to that I read a lot. I'm interested in how the brain works and more specifically and profoundly, is there such a thing as "free will". Do we have free will, or are we preprogrammed? This is a wonderful topic if you ever want to sit quietly and think. These kinds of mental exercises for an 86-year-old are wonderful!

And I live in three countries: six months in Canada, five months in the United States, and a month in France each year.

**CLS:** Thanks, Don, for your time.

**DS:** You are most welcome. It's been fun for me.



Prakriti Sharma

**Prakriti Sharma** ([prakritisapkota1993@gmail.com](mailto:prakritisapkota1993@gmail.com)) has a bachelor's degree in civil engineering from Nepal Engineering College, where she focused on both geotechnical and structural engineering. She is completing her master's thesis on soil-pile structure interaction at the University of Victoria. Prakriti eventually would like to become a bridge engineer, and is looking forward to furthering her work experience in the geotechnical/-structural fields. Hobbies include hiking and traveling; reading and writing.

**Jillian Usher** ([jusher@thurber.ca](mailto:jusher@thurber.ca)) has a bachelor's degree in geological engineering from Queen's University. She works as a Geotechnical EIT with Thurber Engineering in Victoria, where she gravitates towards rock-based field, analytical and modeling projects associated with slope stability and stabilization. Jillian's hobbies include gardening, cooking, hiking, and, in general, enjoying the west coast with her dog, Mike.



Jillian Usher