

Selected Memoirs of Lawrence Mysak: Adventures in Science, Music and Nature

July 2018

For many years I had thought of writing down, mainly for my family, the story of my early life on the Canadian prairies and subsequent career as a scientist. However, such a task seemed very daunting. Besides, would they or anyone else for that matter be interested in such a blow-by-blow description of my life long activities? But an idea from my wife, Janet, made me consider an alternative: Last summer she showed me the 2017-2018 Course Calendar of the Thomas More Institute of Montreal, and suggested that I might like to enroll in a four-month course on Memoir Writing that was to be offered in the winter of 2018.

Hence in January 2018 I started this memoir-writing course, which was led by two inspiring and encouraging instructors, Pauline Beauchamp and Karen Nesbitt, both accomplished writers. Each week we were asked to read articles about memoir-writing techniques or published memoirs, and to write a 700-800 memoir based on an assigned topic. We discussed the reading assignments the following week, and then read our written assignments to the whole class, consisting of nine women and three men. Most of us were retired from a variety of professions. We handed in our memoirs at the end of each two-hour class, and the following week we received written comments from the instructors.

Below I have selected five of the eleven memoirs that I wrote for this course. They give you an idea of the range of topics and challenging questions that we had to deal with. I plan to continue writing memoirs, and from time to time I will add a selection of them to the group below.

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1. El Niño and Me

July 2018

A sweet but mysterious fragrance hits our nostrils as we drive away from Tel Aviv airport in April 1983. “Its from the orange trees, now bursting with ripe fruit,” my wife’s friend Mikael says. “We’ll see many of these trees around Rehovot, where I live. We’ve not had fruit crops like these for many years. It’s probably because we’ve had a huge amount of rain this spring. And the deserts are blooming with bright red and yellow flowers.”

We didn’t think much further about these unusual conditions during our family visit to Israel. Instead, we focused on touring the historic sights of Jerusalem, Masada and the Dead Sea. Also, I was preparing presentations on theoretical oceanography to be given in Rehovot and Haifa.

After returning to Zürich, where I had been on sabbatical since September 1982, I continued developing mathematical models of varying current patterns in the Swiss lakes. In May 1983, I gave a seminar on this topic at the marine institute in Kiel, Germany. There Professor John Woods, a distinguished oceanographer from England, showed me recent maps of the sea surface temperature of the tropical Pacific. In a wide swath along the equator, the ocean temperatures were a remarkable 2 to 3 °C above the long-term average.

“This is the El Niño of the century,” said John. “This huge pool of warm water generates long atmospheric waves which propagate around the globe at mid-latitudes. These dramatically alter the precipitation patterns in North America, Europe *and* the Middle East.”

So, this is probably what produced the unusual crops and flowers in Israel. Clearly, I had to learn about El Niño, and I looked forward to doing so after returning in September 1983 to

my academic home in the Mathematics Department at UBC, where teaching maths was my livelihood.

El Niño is a warming event in the tropical Pacific Ocean that occurs every three to seven years and lasts about twelve months. El Niño means “the Christ child” in Spanish and is used to describe these warming events since they start around Christmas. Alternating with El Niño is La Niña, a cooling event of the tropical Pacific Ocean.

In late 1983, I became even more intrigued about the 1982-83 El Niño when Cornelis Groot, a fisheries scientist from Nanaimo, showed me the latest statistics on the salmon migration routes in the northeast Pacific. In fall 1983, 85% of the Fraser River Sockeye salmon came home to spawn via the northeast end of Vancouver Island. The remainder returned to the Fraser River via Juan de Fuca Strait, to the south of Vancouver Island. In the past, returning Sockeye mostly took the southern route. The 1982-83 El Niño event caused unusually warm water west of Vancouver Island. Since salmon prefer cold water, the returning Sockeye were farther north than usual, close to Alaska, and hence came home via the northern route. This was good news for Canadian fishers since treaty agreements do not allow American fishers to catch Sockeye in Canadian waters east of Vancouver Island.

I was hooked. El Niño (EN) became my focus from that point on. While boning up on El Niño, I learned about an atmospheric circulation pattern in the tropical Pacific called the Southern Oscillation (SO) which is coupled to it to create a complex climate phenomenon known as ENSO. I wrote a review entitled “*El Niño, interannual variability and fisheries in the northeast Pacific Ocean*” about ENSO and El Niño which was published in 1986. It is now one of

my most highly cited papers, which may sound strange since I knew nothing about ENSO before my 1982-83 sabbatical. In retrospect, an observation made during a family visit to Israel sparked a change in my own career.

In the early 1980s, natural climate variability (like ENSO) and global warming due to our massive burning of fossil fuels caught the attention of the press and the public eye. My Harvard class mate, George Philander, wrote a colorful article about ENSO for *National Geographic*. I pinched his pictures for my public lectures about ENSO and fisheries. I also started thinking that I would like to work in a place where climate research was strongly supported. UBC was not likely to become active in this field. When approached by Environment Canada about sponsoring a professorship in climate research, the university administration declined to participate because of financial constraints at UBC. This reinforced my thoughts of a mid-career move. I was 44.

Sometime in 1984, I applied for a mathematics professorship at the University of New South Wales in Australia. I was runner-up for this position. Ted Buchwald, the department head, phoned to say, "You certainly deserve the appointment, but I don't think you would move your family here. Instead, I'm offering the professorship to Roger Grimshaw, from Melbourne." I knew Roger well, and he certainly was an excellent candidate for the job. But this got me riled up. *Damn it, I said to myself, let's see if I'm marketable elsewhere.*

However, getting a senior position after two decades at UBC wouldn't be easy. In addition, Mary, who joined me in Vancouver in 1972 and gave birth to our two children there,

was happily settled. She also enjoyed studying arts at UBC. Can I do this in a new place? she wondered.

Early in 1985 I sent my CV to colleagues in six attractive places where I might do oceans and climate research, namely, Honolulu, Seattle, Corvallis (Oregon), Zürich, Hobart (Tasmania), and Montreal. This led to two interviews, the first in March at McGill, and the second in May at the National Oceanography Lab in Hobart. In June McGill offered me a newly created Chair in Climate Research in the Department of Meteorology, where I was expected to initiate an internationally recognized climate research program. Shortly afterward, the Hobart Lab offered me the position of Chief Scientist to head up research on oceanography, climate and fisheries. With these two offers, it became clear that my career was going in a new direction and that I could soon be facing interesting challenges.

But I was in a quandary. I loved the interdisciplinary aspect of the job in Hobart. But this would be in a non-academic setting. On the other hand, at McGill I would be in a department for which I had no formal training. However, McGill was known to attract excellent graduate students. But, *would I miss teaching mathematics?* When word got out that I might leave Canada for Australia, colleagues pressed me to accept the McGill position. This I did in July 1985.

Mary knew she would miss Vancouver and the spectacular view of the ocean and snow-capped mountains from our bedroom window. But she understood my desire for this career change. We gathered the children in the family room to tell them of the upcoming move.

Claire, who was seven, burst into tears. “I won’t have any friends in Montreal,” she shouted. However, she took the news much better when she learned that there were very good gymnastic clubs in Montreal. Gym was her favorite sport.

Paul, on the other hand, took the news more pragmatically. “Dad, I’m glad you didn’t choose Tasmania because I didn’t want to have to learn a third language, *Tasmanian*,” he said. Being 10 at the time, Paul already had spent several years in French immersion. He was confident that he could cope with French in Montreal.

Upon arriving in Montreal in August 1986, we quickly settled into our new home in Montreal West, a village within a metropolis. Mary soon made friends, helped edit the *Informer*, the local newsletter, and exhibited her photographs at the “Arts, Etc.” event each fall. Mary studied photography at Dawson College in the late 1980s, and in 1992, enrolled at McGill, where she continued working part time towards an arts degree. In 1999, she was the proud holder of a first-class honours BA diploma in Asian Religions.

Our children were ultimately happy with our move to Montreal. They did well at school and in sports. Paul won a top athletic award upon graduation from Lower Canada College and went straight to the University of New Brunswick in 1992 to enroll in a forestry/engineering degree program. At age 17, Claire won the provincial championship on beam in gymnastics; she left home at 19 to attend Bishop’s University, focusing on drama.

The move to McGill also provided me many new opportunities. With funding from McGill and the Quebec government, I founded the multi-faceted Centre for Climate and Global Change Research in 1990. This attracted highly motivated graduate students, as well as a steady

stream of visitors from abroad. I expanded my research interests to include the Arctic climate system, paleoclimates and modelling future global warming scenarios. I also developed interdisciplinary courses in climate and paleoclimate dynamics, which were popular with the students.

Having now been retired for eight years, I look back with fondness on the 80 graduate and postdoctoral students that I have supervised or co-supervised. They are my “academic children”. Twenty-one are now professors in about a dozen countries. It is gratifying to know that they are furthering our understanding of the oceans and their role in climate change. In addition, many of them are informing the public about the environmental dangers due to global warming such as rising sea levels, ocean acidification, extreme storm events and intense heat waves. These students are also helping us learn about the mitigating actions that we can take to sustain life on this planet.

2. Mastering Tone and Technique on the Flute

February 2018

I started on low G, playing without a break, the G-Major scale over the three-octave range of the flute. Then I repeated the scale, but tonguing each note instead: tu, tu, tu, tu, etc. Finally, I played the scale using the articulation of slurring two notes and tonguing two: taha, tu, tu, taha, tu, tu, etc.

“Your technique is good, but your tone is harsh,” commented Albert Tipton, principal flute with the Detroit Symphony. “Please give me your flute.” Mr. Tipton was about 40 years old, athletic and very tall – well over six feet. He peered down at me, a scrawny 18-year old teenager, and yanked off the head joint. “For the next week,” he said, “I want you *only* to practice blowing over the hole in the head joint. Try to develop a more mellow, relaxed sound.”

Tipton then produced the tone that I should strive for. “At the next lesson we will check your tone, and if it’s improved we’ll start to work on a simple Handel Sonata.”

I was stunned. This was summer 1958, and I was studying advanced flute under Professor Tipton at the famed Aspen Music School in Colorado. Earlier in the spring I completed my final exam in Edmonton for the Performance Flute Diploma from the University of Alberta. For the exam I played the elegant but challenging G-Major Mozart Flute Concerto, the demanding Flute Sonata No. 1 by Bach, and the devilishly difficult Sonata for Flute Alone by the contemporary American composer Virgil Thomson. I got 85% on my final exam, a first-class honours grade. But not one of the examiners commented on the quality of my tone, which I

had carefully developed over the past six years. What a shock to be told to go back to the drawing board.

That week was extremely frustrating. Ask yourself, “how many ways can you make a sound by blowing over the top of an open coke bottle?”

Many, as it turns out. Each day I positioned my lips over the opening of the head joint and blew. One day the lips were tight. Another day, they were loose. I tried blowing horizontally across the hole and then more into it. I rotated the head joint away from me, then towards me. I lost count of all the different positions I tried. Miraculously, on the fifth day, I produced a beautiful mellow sound. *This should please Mr. Tipton*, I thought.

Yes, at the second lesson Mr. Tipton was delighted with my improved tone. What a relief, since earlier that week I was ready to head back to Edmonton, as one very disappointed flute player.

Learning Handel’s Flute Sonata No. 4 under Tipton was a joy. Because the music is not too difficult technically, I could concentrate on using my new tone when playing the lyrical melodies in the sonata. An accomplished pianist, Tipton played the piano accompaniment while I did the solo line. At the end of the summer, I wanted to give a recital to show off my new sound.

On performance Mr. Tipton gave me excellent advice. “Never play in public a piece in which you have difficulty playing any of the notes. It’s much better to drop down a level, and play a simpler piece flawlessly,” he said. The Handel sonata suited this philosophy perfectly.

I never did a recital at Aspen, but when I returned to Edmonton in the fall, I played the Handel sonata with ease and enjoyment at concerts with Lynne Newcombe, an outstanding piano student at the university. We were warmly applauded at our performances. Lynne and I also made a vinyl recording of the sonata, which I gave to my parents as a Christmas present. When my 96-year old dad moved into a senior's residence around 2002, the record was rescued by my sister, Helen. A few years later, she passed it on to her daughter, Daphne. One day, Daphne and I hope to make a digital copy of this ancient but fragile recording.

Although I benefitted enormously from my Aspen experience, I decided that a career as a flutist was not for me. There is just too much talent out there to compete with. But I put my new tone to good use over the next 60 years. I have played in chamber groups, entertained seniors in their residences, and given solo performances at birthdays. Also, I have been fortunate to hold, for the past 24 years, the second flute chair in the I Medici di McGill orchestra, which is led by the distinguished Maestro Gilles Auger.

That summer I do remember very well playing under one conducting student. He was about 15, and he ripped us through Haydn's London Symphony No. 104 at neck-breaking speed. *I wonder where he will end up?* I thought. It turned out to be the New York Metropolitan Opera. Yes, in summer of 1958, I played under Maestro James Levine, and later he served as the Met's Music Director for 40 years, from 1976 to 2016.

3. Country Cottage

March 2018

“What are your three financial goals?” asked Nick, my newly acquired financial advisor. After a pause, only two came to mind.

“I’d like to endow a chair in climate research at McGill,” I replied. Nick’s face drew a blank. Then I said, “my wife would love to have a country house.”

“You’re 63. What are you waiting for?” he retorted. Think about where you’d like to be and how much you want to spend.”

That evening Mary phoned her realtor friend Jackie, who soon found us an agent in Sutton, a town we always enjoyed visiting. Next day we were talking excitedly to Peter from Royal LePage. “We want a quiet, forested piece of land with a low maintenance house in good repair,” we said. Within a day Peter sent us six suitable listings.

On a cloudy wintry day in January 2004, we quickly fell in love with a 12-acre property at 1861 McCutcheon, in Dunham County, which is next to Sutton County. On it sat a beige bungalow surrounded by tall white pine, ash and maple trees.

The kitchen window featured a view of the Yamaska River valley and the foothills of Mount Sutton. And inside, natural light from three large windows flooded the open living-dining-kitchen area. Three bedrooms provided enough space for visiting family members and friends. The basement contained a wood-burning stove that heated the whole house. We could already imagine the fragrant smell of burning maple and ash.

We immediately accepted the counter offer from the owner 48 hours after our first visit to the cottage. We didn't want this place to slip away from us, as Peter told us there was another offer on the table. "I'm thrilled we managed to buy this," Mary said.

I still remember our first day at the cottage in May 2004. The leaves were translucent yellow-green, and the birds were chirping constantly. And the aroma of the neighbor's freshly manured farm field brought memories of my youth when I visited grandpa's farm in Saskatchewan.

Mary and I spent most weekends relaxing at the cottage, often with our adult children present. It was also a place where I reviewed my graduate students' theses and revised their papers for publication. We also had week-long holidays there in summer. We loved eating on the warp-around deck shaded by pines and maples, and on hot humid days we splashed in the cool water of the above-ground pool. Today, my grandson, Neil, roars with laughter when I tell him, "I'm going for a swim with my 'nothing on'."

The location of the cottage is very convenient. It's about a one-hour drive from the Champlain bridge. Five minutes away is Cowansville, where there are many food stores and wine shops. And in less than 15 minutes, we are strolling down the friendly streets of Sutton.

Mary enjoyed spending time by herself at the cottage. She meditated above a cliff nearby. Early one evening in summer 2004, a cougar slowly ambled by on a trail below. Fortunately, Mary was downwind of this majestic cat, and thus it was oblivious to her presence. I'm still waiting for the cougar's second appearance.

Sadly, Mary died suddenly in December 2011. But she enjoyed eight relaxing summers there. She especially loved lounging on the massive deck behind the house with a gripping novel in her hands. Some of her ashes are buried under a white pine near the pool.

My children thought I would sell the property after their Mom's death. Instead, in January 2012 my daughter helped me install a 48-inch TV in the living room of the cottage. That month, at 4 a.m. one morning, I got up to watch live, the six-hour epic tennis match between Djokovic and Nadal at the Australian Open. After the match finished, I wondered – will this be my future, living as a couch potato? My destiny proved to be otherwise.

In that January I met Janet at a reception following a *Cutting-Edge Lecture in Science* at McGill. I asked her, "What's your interest in science?" I forgot her reply, but my pick-up line seemed to work. We started dating later that summer, and we married in 2015.

It's fourteen years since I purchased the cottage, and I continue to enjoy it immensely. With Janet now in my life, we use it not only as a peaceful get-away, but also as a place to get exercise in all seasons. We get breathless cross-country skiing in winter and cycling on the hilly backroads in summer. We also play tennis, swim and golf (only me – Janet is the volunteer caddie). In the evenings, we marvel at the many constellations overhead.

We sometimes wonder how long we'll keep the cottage. But being in good health, physically active and very happy with each other, we ask this question less and less. Why worry about uncertainties?

4. Dr. John Weaver, Summer 1961 Supervisor

April 2018

“John, this is Lawrence from Montreal. How are you getting along on the balmy west coast?” I ask over the phone.

“Just fine, thanks,” John replies. “I’m still enjoying morning walks with my fellow seniors. Keeps me in shape.”

“That’s great. Janet and I are visiting Victoria and wondered – are you free for coffee tomorrow afternoon?”

“Certainly,” he says. “How about at 3 p.m.? I’ll pick you up where you’re staying.”

In December 2017, Janet and I were in Victoria for Christmas with her son and family. Whenever I visit Victoria, I always like to see John and his charming Ukrainian wife, Ludmilla. John is the consummate Englishman – polite, cultured and an accomplished scientist; he’s also keen on soccer. More than half a century ago, he was a game-changer for me when in summer 1961, I worked in Victoria at the Pacific Naval Lab (PNL), a federal research institution.

I had just graduated from the University of Alberta, and the PNL job gave me insight into a possible future career as a scientist. John Weaver, on the other hand, just finished a PhD in geophysics from the University of Saskatchewan and was starting his career at PNL in 1961.

When I arrived at PNL, I started working for oceanographer Dr. Harold Grant. I computed energy spectra of ocean temperature and velocity measurements using a slide rule. This sounds complex, but in fact I just multiplied numbers in one column with the numbers in another column, and then added. I was bored, but I had to make a presentation about my

project to the staff. I said diplomatically, “Surely, there must be another task in which I can use my advanced maths and physics.”

Dr. Grant looked stunned. But to his credit, he asked his junior associate Blyth Hughes and the young Dr. Weaver, “Do you think you could find a fluid mechanics problem that Mr. Mysak might tackle for the rest of the summer?” I was grateful to Dr. Grant for understanding my dilemma and allowing me to take on a project of more mathematical interest.

Next day, they suggested I try to solve the equations that describe the flow past a probe used in ocean turbulence measurements. Since I had never taken a course in fluid mechanics, I pored over the treatise *Boundary Layer Theory* for help to solve this problem. While Hughes was my immediate supervisor, it was Dr. Weaver who tutored me in fluid mechanics, one of his passions. Step by step, he led me through the maths that resulted in an approximate solution to the assigned problem. I was thrilled with the project and wrote a lengthy report at the end of the summer. Dr. Weaver also gave me many tips on how to do research. “You have to always look for another approach if one fails,” he said. At the end of the summer, I thought that a problem in fluid mechanics would be a fascinating topic for a PhD thesis.

Dr. Weaver also added an extra dimension to the lives of us summer students working at PNL. During evenings Weaver taught us the finer skills of soccer, and on weekends we played friendly games with other regional teams. That fall Ludmilla gave birth to a son, Andrew.

After my summer in Victoria and a year of graduate study in Australia, I entered Harvard in fall 1963 for my PhD in applied mathematics and engineering science. Dr. Weaver was delighted that I asked him for a letter of reference for Harvard – it must have been a good one,

because in addition to acceptance I received a scholarship which covered my tuition. At Harvard I returned to the topic of my PNL research. In addition to fluid mechanics, I loved studying aerodynamics and, new to me, geophysical fluid dynamics (GFD). My PhD research focused on the GFD topic of continental shelf waves.

Beginning in 1984, I tried to inspire another young student, in the manner that John had inspired me two decades ago. During 1984-87, I supervised at UBC the PhD research of John's brilliant son Andrew Weaver. It was a pleasure for me to watch Andrew, with his intriguing British/Ukrainian temperament, go on to an outstanding career as a professor of oceanography and climatology at the University of Victoria. Today he's the very busy leader of the BC Green Party. Consequently, when I visit Victoria, I don't see my former student, but instead see his father, my friend John, who was my inspiration in 1961.

John moved to the University of Victoria in 1963, and retired in 1998, but our friendship continued to develop. We had fun serving on research grant selection committees together, and colleagues told me that he was a widely respected Dean of Science before retirement. As we are now both retired, we love to chat about former students and colleagues and discuss the challenges and frustrations of university politics. I hope we continue to meet for coffee for a long time to come.

The New Otani Kaimana Beach Hotel is at the eastern end of Waikiki Beach. The landmark Diamond Head volcano rises steeply just behind the hotel. The setting of the crimson sun is a marvel to watch from the hotel's Hau Tree Lanai Restaurant. Janet and I had a romantic dinner there in February 2014 after I proposed to her. But I didn't tell her that I nearly drowned in front of the hotel in the early 1990s.

In February 1991, an international climate committee invited a group of us to Honolulu to write a scientific report on our understanding of the mechanisms that produced mid-latitude climate variability on the decadal timescale. The committee asked us to answer the following questions: What is the source of this variability? Is it due to strong El Nino-type oscillations in the tropical Pacific which propagate to the mid-latitudes? Or are strong air-ice-ocean interactions that occur in the Arctic able to force decadal climate changes at lower latitudes?

I and a few others believed in the second mechanism, but a distinguished climate scientist from Boulder, Colorado said, "Mysak, you are full of beans. There is no way those Arctic interactions in such a small area can significantly affect lower latitude climate."

Most of the workshop attendees sided with the Boulder scientist and hence supported the first mechanism. Consequently, I left that afternoon with disappointment written all over my face. I lost the debate. I then retreated to the Kaimana Beach hotel for a relaxing swim.

In the 1980s I collaborated with Hawaiian Professor Lorenz Magaard on subsurface Rossby waves in the North Pacific. These waves impact on submarine detection, a topic of obvious interest to the US Navy. Thanks to the Navy's support, my late wife Mary and I were

frequent visitors to Honolulu and guests at the hotel. Lorenz often joined us for dinner at the Hau Tree Lanai Restaurant.

One day, Lorenz said, “Why don’t we swim out to the coral reef? It’s just 200 m offshore from the hotel.”

We did this with ease and rested our bums gently on the edge of the sharp reef. There the waves splashed warm, salty water over our faces. The trade winds cooled our faces. The murmur of the breaking waves was soothing. “What bliss!” I shouted.

In February 1991, my swim to the reef from the hotel beach turned into a nightmare. As in the 1980s, I swam out to the reef and rested there. Then I decided it would be fun to go around the corner of the reef and head out to the open ocean. I could see wind surfers having a ball out there, and I wanted to join them. This was an easy swim as there was a rip current that flowed past the side of the reef. I simply swam with the flow, happily washing away my disappointment of the day. It did not occur to me that I might have trouble getting back to shore.

A good swimmer can normally do one body length per second – for a tall person that means 2 m/s. I can keep up this speed for maybe 50 to 100 meters. However, rip currents are much stronger, generally being around 4 to 5 m/s. This was certainly the case here. I quickly decided I had better start swimming back to shore. But, I could not make any progress. Despite my strongest efforts, I was slowly drifting farther out to sea. I started to panic.

“Is this it for me?” I asked myself. There were no life guards or other swimmers near the shore, and so a cry for help would be futile. *I was scared as hell.*

I thought of three possibilities. I might drown right there – I could only tread water for so long. Then I thought I could try swimming along the offshore side of the reef, going parallel to the shore, which would take me towards downtown Honolulu. But once past the reef I would still need to swim back to shore a great distance – about one kilometer. I did not have the strength to do such a long swim. Finally, in desperation, I decided to work my way along the side of the reef toward shore, using my hands to claw myself forward. While doing this, however, I drew blood on my hands, which reddened the water. I looked a mess. I looked over my shoulder to see if a shark was sneaking up behind me.

Thankfully, after about 15 minutes of this hard and painful work, I did get back to the inshore side of the reef. There I rested my weary body and washed my wounds. My hands stung. The minutes of rest seemed like hours. But I finally swam back to shore from the reef.

To this day, I have never told anyone of this near-death experience. I was foolish to do what I did, especially having studied ocean and wave dynamics. But I learned my lesson well.