Donald Douglas Cowan - A Memoir
(Don, Dougie, Dad, Grandpa)

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Chapter 1

Introduction

My aunt Ann Crawford (nee Jackson) has strongly suggested that I should write my life story for my family, so here goes. At the age of 73 (2011), I finally started and have finished a more or less complete draft in 2020. Ann has been very active in genealogy and has been editor and author of several family histories. She recently published her own autobiography. Ann was married to my uncle Donald John Salt until his untimely death from cancer in August 1965. She then married Maurice Crawford in 1972.

As I was growing up, marrying my lovely wife, Margaret and with her raising a family I cannot believe where I have been. I have had an incredible life. If anyone had told me that at almost any stage in my life and career, where I would be in my 20s, 30s, 40s, 50s, 60s, 70s and now my 80s, I would not have believed them. Most of it, except for the death of my wife Margaret in January 2019, has been a great trip.

I decided to publish this memoir on my web site, so that anyone can read it or even print a copy if they wish. This document is not an autobiography as it is more a set of ramblings about my life, than a complete description, as I have never kept a journal or diary.

During part of my career I was the founding Chair of the Computer Science Department at the University of Waterloo. The Department was officially in operation on January 1, 1967. In 1992 Wes Graham and I decided to have a book written to celebrate the first 25 years of the Department, now the David R. Cheriton School of Computer Science. We asked our friend and colleague Peter Ponzo, if he would write the book as he is a good writer with a great sense of humour, but also a wonderful artist who can produce superb cartoons. Wes and I also both knew that if we tried to write the book, it would be terribly biased. I have included a copy of that book on my personal Website as it sets some context.

My personal web site also contains my Curriculum Vitae which summarizes my career by showing:

- a chronological outline of my career;
- honours and awards I have received;
- publications in which I am an author or co-author;
- graduate students and postdoctoral fellows I have supervised; and
- grants I have received.

I should also note that this memoir was written from 2011 to the very early days of 2020 and so as you read, keep that in mind as some of the dates may seem funny.

Chapter 2

The 1930s

2.1 My Parents

My name is Donald Douglas Cowan and my parents are John Donald Cowan and Elsie Amy Cowan (nee Salt). My Father was born March 5, 1911 in Toronto and lived at home at 67 Ritchie Avenue in Toronto until his marriage to my Mother. My Mother was born August 18, 1914 and also lived at home at 33 Lacey Avenue in York Township, at that time a suburb of Toronto, until her marriage. My grandparents were John and Lillian Cowan (nee Boyd) and Ernest and Amy Salt (nee Hickling). Lillian Cowan was born in Canada, but John Cowan immigrated from Northern Ireland from the community of Ballyroney near Belfast. My Salt grandparents immigrated from Derby in England.

My Father was one of 9 children (David (Lillian), Donald (Elsie - me), Ivy(Art - Ray, Anne Louise), Jean (Harry - Bonnie, Janice), William (died of pneumonia at age 3), Tom (Isabel - David), Norman (Esther - Terry, Bruce, Gayle, Donna), Alex (Alvira - Barbara, Bill, Ross, Russel, Allan) and Douglas (died in 1937 from acute appendicitis)). My Mother was one of four children (Ernie (Bertie - Norman, Marion, Keith), Elsie (Donald - me), Wilfred (died in childbirth) and Donald (Ann - Mary, David, John)).[1]

My parents were married on July 4, 1936, American Independence Day. My Father would joke that was the day he lost his independence. They were married at Silverthorn United Church on Kane Avenue in York Township. That was the hottest July 4th on record with the temperature reaching 104F (40C).

At that time my Father was working for the Toronto Transportation Commission (TTC), now the Toronto Transit Commission repairing streetcars.

My parents moved into a rented house on Lisgar Street off Queen Street West in Toronto, where we lived until after I was born. Sometime in 1936, my Father purchased a 1930 Pontiac from a neighbour on Ritchie Avenue. This car lasted until 1948 when it was finally replaced by a new 1948 Ford.

[1] I have added the children, my first cousins, after the name of the spouse, in order by age, oldest first.

Figure 2.1
John and Lillian Cowan (grandparents) at home at 67 Ritchie Avenue

Figure 2.2
33 Lacey Avenue in 1948 with Donald Salt and Ann Jackson

Figure 2.3
Wedding of Don Cowan and Elsie Salt in 1936 with Elsie's Father (Ernie) and Don's brother David and sister Jean

2.2 Birth and Early Years

I was born on March 11, 1938 in the Toronto Western Hospital. I weighed just over 5 pounds and was almost premature. I am an only child. Although my parents planned on a larger family, my Father and Mother were concerned for my Mother's health as she had developed asthma.

Although my Father's name is John Donald, he was known as Donald as his Father's (my Grandfather Cowan) name was John. I was called Donald Douglas Cowan after my Father and his brother Douglas who died in 1936. Of course to avoid confusion I was called Doug or Dougie. My aunt Esther (95 in 2012) continued to call me Doug or Dougie when she phoned.

Shortly after I was born, my parents moved to a rented house on Bicknell Avenue in York Township, a few blocks from my Mother's parents, Ernie and Amy Salt. The house was across the street from my uncle and aunt, Ernie (my Mother's brother) and Bertie Salt.

I learned to talk at an early age when my Father would greet me by saying "How do you do?" when he arrived home from work. I translated that into "How dg do?" I would often sit in my high chair on the porch on Bicknell Avenue greeting passersby with "How dg do?"

World War II started in early September 1939, and several of my uncles served in the Canadian army and air force. My Father could not serve in the armed forces because of flat feet.

My parents must have contracted to build a house in 1939 at 91 Branstone Road before the war started because they were able to complete it and move into the house in 1940. The house was only about a mile from my Salt grandparents' house.

As you will see throughout this autobiography, my parents were incredibly supportive during the entire time they were part of my life. They directed and encouraged me in pursuing my goal,

Figure 2.4
Don Cowan at one year

particularly with respect to education. Unfortunately my Father died at age 49 in 1960, before I graduated from Engineering Physics at the University of Toronto, so he did not even get the opportunity to enjoy his grandchildren. My Mother lived to the age of 85 and participated in our life over the years and even got to see one of her great grandchildren.

Chapter 3

The 1940s

3.1 Our House

In 1940 we moved into the new bungalow at 91 Branstone Road in York Township near the major intersection of Dufferin Street and Eglinton Avenue. I continued to live in this house until September 10, 1960, the day Margaret and I were married. I am told the house which was about 900 square feet cost $2,500. The lot was narrow (45 foot frontage) and long (about 120 feet). There was a large garden at the back which was about 1/2 vegetable garden, 1/4 flower garden and 1/4 lawn. I helped with the gardening from an early age.

In the 1940s, partly because of fuel shortages during World War II (more later), all bread and milk delivery was by horse-drawn closed-in wagons. Guess what, there was a lot of horse manure around the neighbourhood. My job, from a fairly early age, was to take my wagon and a shovel, scoop up the manure and bring it home where my Father would spread Mother Nature's fertilizer on the garden. Later at about the age of 10 or 11 I was given an even more responsible job; I had to dig up the garden with a garden fork in late May, a job which took several hours after school each day. To this day, I still dislike the labour associated with gardening.

3.2 The Neighbourhood

The house was in a typical working class neighbourhood with mixed Protestant and Catholic families. There was no apparent animosity among any group. They were busy just making a living and surviving. Of course many families had fathers and brothers who were in the armed forces. I had an idyllic life as a child playing with the neighbourhood kids. There were the Middletons (Ray, Bruce), Hills (Gordon), Conrads (Ken) and Logues (Bill), all on Branstone Road. There was also Clarkes (Dick), Erskines (Ken), Andrews (George) and McKenzies (Bob) around the corner on Ennerdale Avenue. We were a varied lot, but we all went to the same school and played together. We played war, cowboys and indians, and then later road hockey and football. We would often play road hockey on the snowy street in the winter as there was not much traffic. If the snow on the street was really hard we would put on skates.

During the winter some of the kids on the street would hitch a ride on the back bumper of a car and ride until the car stopped for the stop sign. It was tricky as you had to be careful that you did

Figure 3.1
Don Cowan and his Mother in front of 91 Branstone Road in 1944. Don is wearing his Uncle Alex's military cap

not hit a spot not covered by snow. I never tried it, not because I was particularly well behaved, but the best spot to hitch a bumper ride was in front of our house and frankly I was afraid I would get caught.

My parents got to know the neighbours, particularly on our side of the street. They made particular friends with the Girardos, an Italian family that lived at the corner of Branstone Road and Ennerdale; their backyard backed onto our driveway and they had a great garden and made wine. They often gave my parents vegetables and wine. My parents also befriended the Staceys (Fred, Merle and Joyce); they were around the corner on Branstone and their backyard was at the end of our yard.

We also had relatives just up the street on Ennerdale Road. It took me many years to figure out the relationship, I just considered them to be part of the extended family. My Grandfather Salt's two brothers (Charley and Jack) and sister (Elizabeth) used to live just around the corner from us and I would often visit them in their home. I called them Uncle Charley, Uncle Jick and Aunt Lizzie. They were of course my great uncles and aunt. Even though it was 1940, they still dressed as if it was 1900. I expected they did not have a lot of money and barely got by, but they were very accommodating. I remember the pear tree in their backyard, where we would often pick pears. My Grandfather would visit his siblings from his home on Lacey Avenue, it was about a mile walk, but my Grandmother would never go. There was some bad feelings between them that I never did understand.

Uncle Jick was a bachelor and Aunt Lizzie was a spinster, but Uncle Charley had been married at some time. I suspect his wife may have died. Charley's son, Harry, lived across the street from Charley. He had two children Jimmy and Isabel Salt. Although they were related and Jimmy was

Figure 3.2
Great Uncle Charlie, Great Uncle Jack (Jick) and Aunt Elizabeth (Lizzie) in the backyard of the house on Ennerdale Road in the 1940s

slightly younger than me we never socialized much.

3.3 Balsam Lake and Family Outings

The Staceys, our neighbours, had a cottage on Balsam Lake, about 3 hours (in 1940 and 1950 driving time) from Toronto and they invited us to go to Balsam Lake and stay with them in 1940. This started a long relationship with the Staceys, Balsam Lake and other people we met there. We stayed in the cottage with them for many years going up for a vacation and also for weekends. How my Father and Fred Stacey found the gas, considering wartime rationing, I don't know, but they did. We also met the Downes family; they owned the farm up the road from the cottage and provided us with milk and other things when we were at the cottage. There was a man who used to come during the War with a truck and sell groceries to the cottagers.

In the late 40s the boathouse was converted to a small cabin, which the Cowan family could use at any time and we went to Balsam Lake for our summer vacation and weekends.

During the summer we would often go to the Toronto Island (usually Centre Island) by the TTC Ferry for the day taking a picnic lunch and either swimming in Lake Ontario (brr!!) or Toronto Harbour. Once in a while we would go to Sunnyside in the west end of Toronto, which had a swimming pool and an amusement park with rides. Of course annual trips to the Canadian National Exhibition (CNE), still in operation, were always an important part of the summer. We used to go and try all the free samples that were distributed, particularly the free food. What would the health department think of these free food samples now with all the regulations on food handling in place? Of course in late 40s and early 50s there was a polio epidemic in Toronto, thereby curtailing some of the swimming expeditions, particularly those in Toronto harbour.

Once we obtained a reliable car we would often go for Sunday drives to see various other locations near Toronto. We once made it to Galt (now part of Cambridge) on a Sunday afternoon; Kitchener-Waterloo was just too far. We often went east to Whitby where we met up with Lil Bagworth's

Figure 3.3
Don Cowan in front of the Stacey Cottage showing a fish he caught

(Cec and Lil Bagworth were friends of my parents, Cec worked for the TTC as an inspector) Father at his house. Another favorite trip was to the Cronin (my aunt Esther's family) farm near Bolton on a Sunday, where we would enjoy Sunday noon dinner and my Dad would shoot groundhogs, one of my Dad's favorite pastimes.

3.4 Elementary School

In September 1943 at age $5\frac{1}{2}$ I started elementary school at Fairbank Memorial Public School, now called Fairbank Memorial Community School (http://www.tdsb.on.ca/schools/index.asp?schno=6164). It is located two blocks south of Eglinton Avenue between Harvie and Nairn Avenues. At that time the school was part of the York Township Board of Education.

I stared in morning Kindergarten and finished in Grade 8 before going on to high school. It was a good working class school considering the neighbourhoods it served. The teachers were reasonable all the way through the grades. I was a fairly bright kid and was allowed to take Grades 3 and 4 in one year rather than two, thus finishing elementary school or public school as it was called in those days in 8 years rather than 9. The reason for the name "public school" was to contrast us with the Roman Catholic elementary school which some kids attended. By the end of the 40s I was in Grade 7.

In Grade 5 there was a student in my class by the name of Douglas Easterbrook. I decided, in order to avoid confusion, to become Don Cowan, so I changed my name. Little did I realize that Douglas Easterbrook's brother Donald was in my class as well. Well I created a problem around the school until they discovered the "new" student was just a relabeled old one.

Figure 3.4
Don Cowan, Front Row middle, Grade 1, 1944-45 - Fairbank Memorial Public School, now Fairbank Memorial Community School

The teachers were a reasonable bunch; strict but fair most of the time. There was Miss Dunsford in Kindergarten, Miss Black in Grade 1. Of course in those days, you could not be a married woman and be a teacher. If you became engaged you had to resign. I suspect there were many relationships that were not publicly announced, so that both parties could keep their job. Of course these restrictions did not affect the men. Male teachers were Mr Jirard and Mr. Thompson. Mr. Jirard used to teach while bending a yardstick over the knobs on the back of the chair. I worried that one day it would break; sure enough it did and went flying across the room narrowly missing a number of students. Mr. Thompson was the vice-principal and in charge of punishment; he was quite talented with the strap. He was a small man and quite literally left his feet when he delivered a blow. I know the details of his performance, because I was the recipient of this punishment once, although I don't remember the reason.

I remember learning to print with a pencil in Grades 1 and 2 and then moved on to writing in Grades 3 and beyond. Of course writing was with a straight pen and ink in a little pot called an ink well in a hole in your desk. Pictures of a straight pen similar to the one I used and a desk with an ink-well hole are in Figures 3.5 and 3.6. As you can imagine, ink was everywhere, on blots on the paper on your hands and even on your clothes. The ink well was removable so it could be filled. I remember poking at the ink well from the bottom and it flew out and splashed ink on the girl in the desk in front of me. Boy, was I in trouble. Ball point pens were invented near the end of my days in elementary school. Although the ink was in the pen, they were very messy, as the ink did not dry fast like today and so would also get on everything.

Figure 3.5
A straight pen somewhat like the ones I used in elementary school

Figure 3.6
A desk with an ink well

3.5 Health

I was a small kid until I had my tonsils removed when I was 5 before first attending school. By the way, the operation was performed on the kitchen table by our family doctor. Removing tonsils was no big deal in those days. Going to a hospital was not necessary.

I then got to eat ice cream and drink ginger ale for a few days until my throat healed. I then developed an appetite and started to put on weight, an affliction that is still a problem for me.

During elementary school I caught all the usual childhood diseases such as measles, german measles, chicken pox and the mumps. Fortunately I managed to avoid polio, a scourge in those days. Quite often, someone with polio would end up in a iron lung as the polio virus paralyzed the muscles that control breathing.

3.6 World War II

I was born before World War II and do remember bits and pieces of that brutal war. For example, we did have rationing of many items and had to have ration stamps to purchase limited quantities of things like butter. My grandmother Salt used to send letters to England to our many relatives with sticks of gum as a bit of a treat. I don't know how well it was received, as chewing gum was not the norm in England at that time, although they may have picked up the habit from the American servicemen.

I remember both VE (Victory in Europe) day on May 8, 1945, which commemorated the unconditional surrender of the armed forces of Nazi Germany and the end of Adolf Hitler's Third Reich and VJ (Victory over Japan) Day, which celebrated the announcement of Japan's surrender on August 14, 1945. In both cases many neighbourhoods built large bonfires in the middle of the street. I remember celebrating with the Atkins family on VJ Day. They were friends of my parents and lived on Day Avenue near Rogers Road and Dufferin Street in Toronto.

Three of my uncles on the Cowan side of the family served in the Canadian armed forces, Norman and Tom in the Army and Alex in the Air Force. They all survived the ordeal, although I believe Tom was wounded, but not too seriously. No one served on the Salt side of the family. I believe Ernie had health problems and Donald was just finishing high school in 1944 and had been admitted to Engineering Physics at the University of Toronto.

3.7 Cars

During the 1930s and most of the 1940s my Father drove the 1930 Pontiac (see Figure 3.7) he had purchased in 1936.[1] He kept it in reasonable repair. Of course there were no seat belts or other restraining devices. I remember my Father stopping once in a hurry with me in the front seat; again no restrictions on age. I hit my head on the dashboard. I have a scar on my forehead to prove it, although it has almost disappeared with age.

At one point after the war the sides started to part from the rest of the car. My Father took the car to Wychwood Car Barns (they fixed streetcars) where he was a Foreman and had a rod bolted through the side posts to hold the car together; it worked.

[1] Our car was blue.

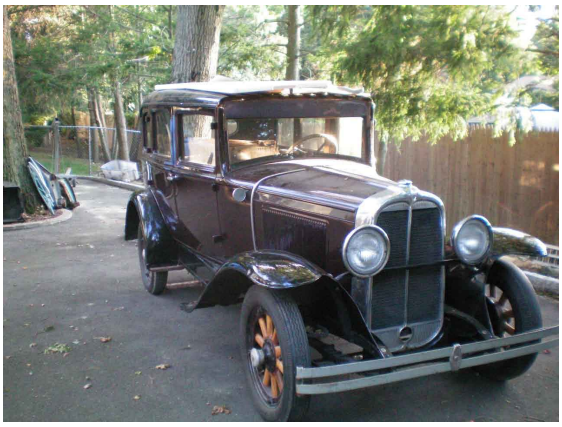


Figure 3.7
1930 Pontiac Four Door Sedan

My Father had a Chevrolet on order from British American (BA) Motors on Avenue Road since just after the war. However, there was always some excuse as to why they could not get him one. He finally became totally fed up and walked the block from Wychwood Car Barns (https://en.wikipedia.org/wiki/Wychwood_Barns) to Hillcrest Motors and bought a new 1948 Ford two-door[2] (see Figure 3.8) off the lot. This was quite a car, it even had a radio with tubes (light bulbs with a personality). We took the car out for a spin around Toronto that evening with the radio playing. Because the traffic was stop and go, the radio drained the battery and we had to get a push.

Of course now we had a fancy car, it needed a garage to house it. My Father built a garage behind the house. It was quite a feat of engineering. The footings were poured with bolts in them and then the 2x4s that formed the base of the walls were bolted to the footings. This made for extremely strong walls.

3.8 Sports

Although i was not a particularly good athlete we played lots of sports around the neighbourhood. During one winter probably in Grade 7, I joined an organized hockey team that was sponsored by a local construction company. I played defence, but was not very good and spent most of my time on the bench, once the coach discovered how bad I was. We played in arenas all over the west end of the greater Toronto area, wherever ice was available. I remember one game as far away as Nobleton. We would usually ride to the games in the middle of winter in a wide open truck such as a dump truck. Safety was not a big concern in those days.

[2]This car was grey.

Figure 3.8
1948 Ford Two Door

3.9 Christmas

Christmas was always important in our family. We visited with my parents families on both sides. In the early years before my Grandmother Cowan (nee Lillie Boyd) died (1947), we would have two Christmas dinners, noon at the Cowan grandparents and evening at the Salts. We were stuffed. I was always well treated at Christmas, although not overloaded with presents. I always remember when I was about 10 receiving a bedside radio. This was 1948 and a table radio was still a novelty. Wow, I was in seventh heaven. There would be gifts from Santa, parents, grandparents and aunts and uncles.

Of course a highlight of the Christmas season was the Eatons' Santa Claus parade always held on a Saturday morning (not a Sunday like today) in downtown Toronto. Remember that Toronto was known as "Toronto the Good" in those days, because the only establishments open were the churches and even the streetcars ran on a Sunday schedule. The parade was quite long and took about 1 1/2 hours to pass a single point with the jolly elf, Santa Claus as the finale.

Once the parade was over we would usually go home. Probably the next weekend we would go to downtown Toronto (Queen and Yonge streets) and see the decorated windows in both Eatons and Simpsons followed by a visit to Santa Claus in Eatons. As a final treat I would often get a hot ice cream sandwich which was two freshly baked waffles with a slab of vanilla ice cream. This was obtained in the passage way between the Eatons Store and Eatons Annex, the store's bargain basement. Eatons and Simpsons were located at Queen and Yonge Streets in Toronto, Eatons on the south side of Queen and Simpsons on the north. They were department store rivals. Both have since disappeared.

Figure 3.9
Christmas 1956

Chapter 4

The 1950s

I continued to live at 91 Branstone Road and in 1950 at the age of 12, I enrolled in Grade 8 at Fairbank Memorial Public School for my last year. I was a year younger than most of the kids in the class because I had combined grades 3 and 4 in one year. I entered my last year of elementary school in 1950.

4.1 High School

In 1951 at the tender age of 13, I enrolled in Grade 9 at York Memorial Collegiate Institute (YMCI - schools.tdsb.on.ca/yorkmemorial/),[1] where I spent my entire high school career. YMCI is located on Eglinton Avenue West at the corner of Trethewey Drive in the City of Toronto. YMCI was a family school in that my uncle (Donald Salt) attended there from 1939 to 1944 and both my mother Elsie and my uncle Ernie Salt also attended the school briefly as it opened in 1929 near the end of their years in high school.

During grade nine I did not participate in any sports other than phys-ed class. I was a chubby kid at that point weighing about 195 pounds (88.6 kilos) at a height of about 5ft 8in (1.73M). However in grade 10, the phys-ed teacher Fred Hall decided I was built like a football lineman and talked me into trying out for the midget football team, which I found I enjoyed. In those days there were three levels, midget, junior and senior based on age. I played midget football in the Fall of 1952 (Grade 10), junior football in the Fall of 1953 (Grade 11) and 1954 (Grade 12) and senior football in the Fall of 1955 (Grade 13).

The most memorable football game of my high school career was Friday October 15, 1954 when Hurricane Hazel (http://en.wikipedia.org/wiki/Hurricane_Hazel) hit Toronto. We played that afternoon at Leaside High School. The field was covered in water and we almost drowned the quarterback when we tackled him in a rather large puddle.

At that moment I was living with my Grandfather Salt at my Salt grandparents' house on Lacey Avenue as my parents and Grandmother Salt were in Baltimore visiting an old friend of my Grandmother. My parents and Grandmother drove home in the hurricane and just made it across the Humber River bridge on the Queen Elizabeth Highway before it collapsed. The following day

[1] YMCi was ravaged by a 6-alarm fire (https://www.cbc.ca/news/canada/toronto/york-memorial-memo-fire-cause-1.5264889) in April 2019 and is now under discussion for reconstruction.

Figure 4.1
Don Cowan, Second Row left, Grade 8, 1950-51 - Fairbank Memorial Public School

Figure 4.2
York Memorial Collegiate Institute

Figure 4.3
The Weston Golf Club was left submerged after the Humber River burst its banks during Hurricane Hazel in Toronto

we went out to survey the damage; it was horrendous with cars and houses washed away from the flooding of the Humber River (see Figure 4.3). Several people drowned as well.

The football teams on which I played never won a championship but we had a good time playing against other suburban teams such as Weston, Etobicoke, East York, Runnymede and Leaside. At that time, Toronto had not amalgamated and so high school sports were either in the Toronto Secondary Schools Athletics Association (TSSAA) or the Toronto District Intercollegiate Athletic Association (TDIAA). The year I was in Grade 10, playing midget football, the Junior team won the TDIAA championship; the first time the school had ever won a football championship. This was such a big deal that the principal declared a school holiday the next day.

4.2 My High School Education

I was a reasonably good student and received pretty good marks. My strongest subjects were Mathematics and the Physical Sciences (Physics and Chemistry). If you achieved over 75% in a course over the year in the first four years of high school, you did not have to write the final examination in the course. In those days high school was five years. I only had to write one final examination; that was grade 12 English.

In the final fifth year of high school all students across the Province of Ontario had to write so-called departmental exams in each subject for which they wanted to receive high school credit, a necessary condition for entering university or other professions such as nursing. Nursing was often offered by nursing schools affiliated with hospitals. These were standard exams set and marked by

teachers supervised by professors in the subject, and managed by the Province of Ontario. Today (2020) there are only four years of high school and no such standard exams. Each school sets its own standards, a nightmare for universities and colleges examining students' marks for entry.

I wrote exams in 3 mathematics (algebra, geometry, trigonometry), 2 sciences (physics, chemistry), 2 English (literature and composition) and 2 French (literature and composition); 9 exams in all. I managed a respectable 75.1% which was enough to get me into Engineering Physics, claimed to be one of the two toughest programs at the University of Toronto, the other being Mathematics, Physics and Chemistry (MPC).

4.3 Teachers

My teachers in general were reasonable people who taught us well. I have listed next all the ones I remember. Some of these teachers taught my uncle as well, including Cooley, Arnold, White, Thomas, Hetherington and Brubacher. One of my teachers who is still alive (about 90 in 2012) is Bill Carmichael. His son-in-law, Paul Eagles taught at the University of Waterloo and so I keep track of him.

- Mathematics - Frank Cooley, Bill Carmichael, Fred Hall,
- Science - Bugsy Arnold, Danny Thompson, William White
- English - Isabel Thomas
- French - Helen Hetherington, Irene Peebles
- German, Latin - Blanche Hiltz, Charles Brubacher
- History - Keith Davis
- Geography and Guidance - Brewer
- Physical Education - Fred Hall, Doug Barbour

4.4 Weekend Jobs

My parents insisted that I should work for my own spending money, and so once I reached high school I worked for various grocery store chains on Saturday. In the 1950s, stores did not stay open evenings or Sunday; the stores opened at about 8:30am and closed at 6pm. I don't remember the order but I worked for the Power store on Eglinton Avenue two blocks from home and on Parliament street in the east end of Toronto, an hour street car ride from home. I also worked for Loblaws, which at that time was at Dufferin and Eglinton about 4 blocks from home. I also had a short tenure as a delivery boy for a drug store at Eglinton and Caledonia but that did not last long, as most nights the delivery boy was riding a bike in impossible weather.

My final year of high school and part of my first year in University was spent working at the Simpsons Department store in downtown Toronto, which leads to another story. Eatons and Simpsons department stores were across Queen Street from each other in downtown Toronto and were rivals. They formed two clubs for teenagers with the idea of creating brand loyalty, although I don't

Figure 4.4
Simpsons Collegiate Club 1955-56 representing all the high schools in the Greater Toronto Area.
Don Cowan is in the third row with the tilted head

think it was called that in those days. There were Simpsons Collegiate Club and Eatons Junior Executives. They chose a boy and girl from each school in the Toronto area. I was fortunate enough to be chosen as the Simpsons Collegiate Club boy representative from YMCI, while my friend Bob McLean was chosen for the Eatons position.

I made numerous friends from those clubs, meeting other teens from around Toronto and suburbs. One of them, Dennis Foster has remained a lifelong friend.

4.5 Summer Jobs during High School

I not only held down weekend jobs but I had to find a job for the two to three-month summer vacation after each of the 5 years of high school. This job had three purposes: to teach me about working for a living, to keep me out of trouble and finally to save some money for university. I had decided in the last few years of elementary school that I wanted to attend university and take the same program (Engineering Physics - Geophysics Option) as my uncle, Donald Salt. I think my parents had the same ambition for me.

I was very fortunate for three of the summer jobs after Grades 9 (1952), 12 (1955) and 13 (1956). I worked for a company called Geo-Explorers, a mining exploration company owned and operated by my uncle Donald Salt. I don't think the job was charity, he needed all the cheap field help he could get. I also learned a lot about mining exploration and why I wanted to study Engineering Physics, but not geophysics.

After grade 9, my parents drove me to Rouyn-Noranda in Quebec, where I lived with my uncle and aunt, Donald and Ann Salt during the month of June, while I repaired equipment, mostly snowshoes. On July 1st we flew out of Val-d'Or Quebec by float plane to Chibougamau, where we camped before moving on to a survey camp where I learned to cut survey lines and run a magnetometer survey by helping my uncle. I was then assigned to another crew after this job was finished. Near the end of the summer, my Mother was diagnosed with cancer and I was sent home a bit early. My Mother survived and lived to be almost 86.

After Grade 12, I again worked for Geo-Explorers, but in Toronto for the entire summer repairing equipment. At Easter in Grade 13, I picked up the Geo-Explorers Land Rover as it was being repaired in Toronto and drove it to a mining exploration camp near Rouyn-Noranda. My cousin Norman Salt came along to keep me company. After delivering the vehicle in several feet of snow, we took the Ontario Northland train back to Toronto.

After Grade 13, I picked up the Geo-Explorers Land Rover again being repaired, this time in Quebec City, and drove it to Chibougamau where I met up with Bob Wilkinson. He was doing surveying for Geo-Explorers. After working with Bob I returned to Noranda and we went to Massey Ontario where I worked with Reg Tays on another project. Finally we returned to Noranda where I was given a survey party of my own to do a resistance survey near Amos Quebec. The only problem was that half the property was under water. After completing that work I returned to Toronto to enter my first year at the University of Toronto.

There was no work in the mining exploration business for me after Grade 10 (1953) or Grade 11 (1954), so I looked for a job in Toronto. I approached the Dominion Bank (now the Toronto-Dominion Bank operating as TD Canada Trust) in 1953, and was hired as a junior clerk and sent to the branch at Bloor and Bathurst. I was in charge of recording and delivering the bank drafts to all the businesses in the few blocks around that corner. A bank draft in those days was basically a bill from a supplier to a local business. One of my clients was Honest Ed Mirvish. I was told by the bank manager to make sure I did not misplace any of Honest Ed's drafts, because even in the 50s, Ed Mirvish was an important customer. I returned to the job again in 1954 and was offered a permanent position in the bank, which I declined as I had already decided I wanted to attend university.

4.6 High School Friends

I developed many friendships in high school at York Memorial Collegiate Institute (YMCI) and through Simpsons Collegiate Club and some of them have remained friend ever since. Boys: Bob McLean, Neil Gallichan, Bud Wicks, Bob McKenzie, Harold Paddock, Norman Ashton, Dennis Foster. Girls: Judy Barth, Jackie Fountain, Argyle Galbraith, Annabelle Kerr, Diane Johnston, Margaret Short (my future wife).

Figure 4.5
My future wife, Margaret Short in 1956

4.7 Meeting My Future Wife

I met Margaret Short, my wife of almost 59 years (as of her death in 2019) and began dating her in high school. She had moved to YMCI for Grade 11 from Vaughan Road Collegiate in 1954 after immigrating to Canada in 1952 with her Mother (Winnifred Lucy Short nee Kent) and her brother (Clifford). Her father (Leonard George Short) had immigrated to Canada a year earlier in 1951 and taken a job with A.V. Roe working as an aircraft fitter on the ill-fated Avro Arrow. By the time I met Margaret, her Father had left the aircraft industry (he also worked for de Havilland) and was managing a large block of apartment buildings on Trethewey Drive, about a mile from YMCI.

I was introduced to Margaret by an earlier girl friend (Diane Johnston) as they were both in Rangers, which was the senior branch of the Girl Guides. I was not at a meeting, but they were assembled at Diane's house when I happened to drop by. I admired Margaret from afar and then asked her out on a date with some other friends. We seemed to enjoy each others' company and so it looked like things might be become more serious, which they did shortly after.

Of course I was looking around at the time and was dating other girls. I remember being out with Margaret and another couple and getting my Father's car stuck in the mud. We eventually got out, but not till after I got my pants covered in mud. The problem was that I was taking another

girl out the next night and also had to wear the pants to work at Simpsons on the Saturday. I managed all these situations but don't remember how. The trials of teenage angst.

Pretty soon, it was serious and we were going steady. Another time, Marg forgot her key and could not wake her parents and so I took her home to my house, where my parents welcomed her. She ended up using my bed and I slept on the living room floor.

We dated all through high school and when Margaret was in Nursing at Toronto Western Hospital and I was in Engineering Physics at the University of Toronto. We were married on September 10, 1960, but more about that later. Our toughest time at being apart was for over two months when Margaret was at Camp White Pine in Haliburton doing kitchen duties, and I was in Northern Quebec and Ontario doing mining exploration.

4.8 Balsam Lake

I spent many great summers and weekends with my parents at Balsam Lake, particularly when I was in public school. Once I started working at summer jobs out of town, of course the visits to the cottage did not happen except for the summers of 1953 and 1954 when I worked at the Dominion Bank. In 1954 my Father decided to build a cottage on Balsam Lake just up the road from the Staceys. He purchased land from Bill Downes who owned the farm and erected a pre-fabricated cottage. This cottage stayed in the family until about 1986 when my Mother could no longer maintain it and our family lived too far away to go to the cottage very often.

4.9 University of Toronto - Engineering Physics

In the Fall of 1956 I entered first year of Engineering Physics (now called Engineering Science - http://www.engsci.utoronto.ca/) in the Faculty of Applied Science and Engineering at the University of Toronto (UT). It was claimed to be one of the two hardest programs at UT and it was certainly socked with lots of courses in Mathematics and Physics.

Our home base was a number of Engineering buildings at the south end of the campus near and on College Street. The actual home of Engineering Physics, which was a program, not a department was in the original engineering building called the "Skulehouse" as the original name of the Faculty was the "School of Practical Science." A picture of the Skulehouse in the early part of the 20th century is in Figure 4.7.

My first day in Eng Phys we were gathered together (all 180 of us) to hear about the many wonderful options (Electrical, Heat Engines, Geophysics, Metallurgy. Nuclear, Aeronautical ...) awaiting us in third year. Each professor described a speciality and invited us to follow them to their lab after all the presentations, and experience the wonders of their particular field. Finally Professor Ralph Stanton (this is my first encounter with Ralph - more about him later when I get to the University of Waterloo as he dramatically influenced my career) of the Mathematics Department (I don't know why he was there, since there was no mathematics option) announced that if anyone wished to accompany him, he would be glad to show them a pad of paper and a pencil. Needless to say he brought the house down with laughter.

My days in Eng Phys were filled with classes and labs; anywhere from 35 to 45 hours per week were spent taking lectures and laboratories in Mathematics, Physics and various Engineering

Figure 4.6
The Balsam Lake Cottage in the middle of winter

Figure 4.7
A Picture of the Skulehouse in 1904, erected 1878 - demolished 1967

subjects. The number of hours depended on the year; with second year being the hardest and most intense; those who survived second year usually graduated.

I was a street car kid in that I lived at home (fees for living in residence were just not possible) and journeyed to UT every weekday on the streetcar, trolley bus or subway and sometimes on Saturday for a 1/2 day. I usually met my high school classmate Bob McLean on Eglinton Avenue in front of Prospect Cemetery to catch the streetcar for UT. Once home, I had dinner and then hit the books for quite a few hours. A large part of the weekend was also spent studying although I managed a few hours going out with the love of my life, Margaret Short, when she wasn't tied up with her nursing duties and studies at Toronto Western Hospital.

I worked fairly hard during my years at UT and did reasonably well academically. I always remember my second year when I went to check my standing in the Globe and Mail, the standard way of publishing the pass and fail in those days. I looked over the Pass list and I was not in it. My heart almost stopped as I resigned myself to repeating second year. I then looked at the Honours list to see who had done really well, and there was my name. Wow, what a wonderful shock. In those days if you received a passing average, but failed a course then you could write a supplemental exam. I only had one of those in Acoustics in third year. I wrote the supplemental in August and passed using the crib notes (perfectly legal) from my classmate John Perz. More about my final year in 1960 in the next chapter.

4.10 Summer Jobs during University

By the time I got to University I decided I was not interested in spending my life in the "bush" doing geophysics and mining exploration as my uncle was doing. I decided I was more interested in electricity and eventually opted for the Electrical option in Eng Phys. So during the summers I looked for and held jobs in Toronto.

I was fortunate in that my father worked for the Toronto Transit Commission (TTC) and so was able to get a summer job in Parkdale Shops, a large bus repair facility just off Dundas Street. I spent the summer of 1957 and 1958 working there doing everything from repairing bus parts, to fixing bus tires, batteries and degreasing parts in a large heated vat of carbon tetrachloride. The chief foreman removed me from fixing bus parts after I showed that I really wasn't very good. One advantage of working for the TTC was a bus pass that provided free transportation anywhere in the city.

In 1959 I was able to get a job with Ontario Hydro Research on Strachan Avenue near the Canadian National Exhibition (CNE) grounds. I was assigned to the measurement group and so spent quit a bit of time on the roof of the building connecting electric meters as they had to be tested in all weather conditions. Of course access to the roof was great; because it meant we had the best seats in town to watch the CNE air show. I remember working with one technician who was a bit of joker. I leapt over a wall to the other side of the roof and commented "What an athlete" and my technician friend thought for a moment and said "Yeh all ath."

4.11 Driving and My First Car

In the summer of 1954 while I was working at the Dominion Bank, my parents thought I should learn to drive. My Dad would not teach me to drive, as he claimed he did not have the patience, and so I was sent to driver training school. I think my Mother found the trainer, as I believe she had taken lessons with him in her first attempt to get a licence.

I took driver training on a stick shift (manual transmission) after work in the area around Bloor, Bathurst and Spadina in Toronto and took my test at the testing centre on Spadina. I passed the first time, what a miracle. That night my Father had me drive him and my Mother to my Uncle Norman's house just off Dixie Road and the Queen Elizabeth Way. I passed with flying colours; even my Father was impressed and he did not impress easily.

During the late spring of 1959 I talked with my Father one day about getting a car. I didn't expect him to agree to finance it, but he did. We journeyed down to the Volkswagen dealer on Yonge Street and purchased a 1959 Volkswagen for $1,500. This "Bug" was my pride and joy for four years. Of course Volkswagen had only been in Canada for about two years, but were solid and generally reliable.

4.12 Travel

I managed a bit of travel during my teenage years. Apart from the time spent in Northern Quebec and Ontario, I went to Florida on a bus trip with my Mother and Grandmother Salt and went to New York by train with my Mother, my old girlfriend Diane Johnston and her Mother.

Figure 4.8
My First Car - 1959 Volkswagen with Bob McLean and Don Cowan

Chapter 5

The 1960s

From now on the most of this autobiography will be organized by topic within the decade. I will also try and preserve the chronological order as much as is possible.

5.1 1960

The year 1960 had its serious ups and downs. To quote Charles Dickens from a Tale of Two Cities, "It was the best of times, it was the worst of times."

I was in the final term of my final year of Eng Phys. I was looking to do a Masters degree in Electrical Engineering at UT, but was turned down. At the same time Ralph Stanton (see Figure 5.1) arrived from the new University of Waterloo (UW) looking for people to be Teaching Assistants for the undergraduate program in Engineering which had started in 1957. He offered a chance to get a Masters degree in Applied Mathematics, free fees and a $250 per month stipend. At that time $450 per month was a good salary for a graduating engineer. I was lucky enough to be interviewed. As a footnote, I was also interviewed and offered a job at Atomic Energy of Canada at Chalk River.

I thought I had botched the interview with Ralph, but he must have seen something in me as he phoned me at home in February to offer me the job as a Teaching Assistant. I accepted immediately, and then told my parents and Margaret. Even though the University of Waterloo was new and did not have a reputation, I trusted Ralph.

On a Sunday in March, Marg and I hopped in my Volkswagen bug and headed off to Waterloo to check it out. After a lengthy drive on Highways 401, 25 and 7 through Acton, Guelph and finally to Kitchener-Waterloo (remember Highway 401 only went as far as Milton in 1960), we arrived in front of the Waterloo Hotel at King and Erb Streets in Waterloo (population 20,000).

We asked what appeared to be a local person for directions to the University of Waterloo. He had never heard of the place; so we asked for Waterloo College as it had been around 49 years and surely should be well known. If we could find the College, we could find UW, as UW had originated from the College and was close by. The directions were simple, go up King Street to Dearborn (now University Avenue) and turn left. Sure enough we found it. One building (Chemical Engineering) with one under construction (Physics and Mathematics). There wasn't much else to see, so we wended our way back to Toronto.

This new beginning looked exciting. I planned to come to Waterloo in September for one year,

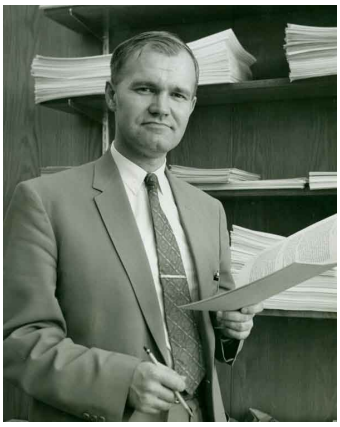


Figure 5.1
Ralph Stanton in his early years at the University of Waterloo

then Marg and I would marry on Boxing Day 1960, and she would move to Waterloo. Here I am still in Waterloo, as this book is being written.

However, there was a shadow lurking behind us. My Father died at the Balsam Lake cottage on April 3, 1960 at age 49. This was devastating for the entire Cowan family. Of course my Mother was most affected. However, I was about to write my final exams for fourth year and studying was difficult. Unbeknownst to me, my Mother in spite of her grief, phoned K.B. Jackson, the Head of Engineering Physics, and told him what had happened. My Mother only told me about this when I graduated from UT in June 1960. K.B. Jackson assured her that I would pass based on my year's results even if I did not do well on my final exams. Although I did write all the exams, to this day I will never know if I really passed them or not.

After the funeral my Father was cremated. Later in the year, my Mother with some close friends (the Bagworths are the only ones I remember) scattered my Father's ashes in Balsam Lake in front of the cottage. Balsam Lake and the cottage were very special to my Father and Mother, and it seemed appropriate.

Shortly after the funeral my Uncle Donald took Marg and me aside and suggested we get married in September; what was the point in waiting. We spent the summer preparing for our wedding on September 10, 1960. We rented an apartment in Kitchener at 15 North Drive behind St. Mary's hospital (apartments were hard to find) and moved most of our sparse furnishings to Kitchener in August with the help of Dennis Foster and a rented truck. The rent was $80 per month.

Of course my Mother at age 46 was devastated, very lonely and also needed a job as my Father had not left a lot of money, although the house and cottage were debt-free. The TTC offered my Mother a job. I suggested she might also approach YMCI, her and my old high school. She talked with them and was offered the job of secretary in the front office. This was very convenient as it was only a mile from home. She worked there until 1979 when she retired.

During the summer, Marg was finishing her nursing training and applied for a job at Kitchener-Waterloo Hospital, now Grand River Hospital. This was before we had found our apartment. I worked at Atomic Energy of Canada Limited (AECL) in Etobicoke, at that time a suburb of

Figure 5.2
The Salt Family at Marg and Don's Wedding - Donald, Elsie (Mom), Ernie (Grandpa), Amy (Grandma) and Ernie

Toronto, participating in the design of the Bruce Nuclear Power Station, the first nuclear station in Ontario and one of the early designs.

On September 10, 1960 Marg and I were married at St. Columba's Anglican Church in Scarborough (Marg's parents had moved to Scarborough to manage another group of apartment buildings). Marg finished her nursing training that morning and we were married in the afternoon. Marg's maid of honor was Sky Kveps, her roommate in Nursing and the flower girl was 3 year-old Donna Cowan, my cousin. Marg's brother Cliff Short was my best man and the ushers were Bob McLean[1] and Dennis Foster, two good friends to this day. We had a luncheon reception in the church hall (no alcohol), and then we traveled to Algonquin Park for a 4-day honeymoon at Whitefish Lodge, which burned down a number of years ago. On September 14, we journeyed to Kitchener and moved into our apartment. I was to start at the University of Waterloo the next day, September 15.

Marg had a job at Kitchener-Waterloo River Hospital which she started in October. Her salary was also $250 per month. During the day she would take the bus, but when she was on the afternoon or night shift, I would try and drive her both ways if possible. At that time Marg did not drive.

5.1.1 Introduction to the University of Waterloo

I arrived at Ralph Stanton's office in the Physics Building on September 15, 1960 at the same time as Jim Corbett, one of my classmates from Eng Phys at UT. We were greeted by Alma Fielding, Ralph's secretary, who proceeded to ask Wes Graham to show us around. I remember her saying "Wesley dear, would you mind showing these young gentlemen around?" Wes and I did not really connect after that as he was at UT during the academic year 1960-61 working with Kelly Gotlieb studying for a PhD, which he never did complete. Wes wanted to accomplish things at Waterloo and did not have the patience to spend a "ridiculous" amount of time on a PhD.

I and my colleagues were housed in the penthouse of the Physics building. The group consisted

[1] Unfortunately, Bob died in 2018.

Figure 5.3
Marg and Don Cowan Wedding September 10, 1960

of Don Cowan, Jim Corbett, Ian McGee, Peter Woon, Barry Reed, John Schewchun, Harold Bell, Herb Schwartz, Bill Vetter, George Baird, Bill Miller and Ferenc Takacs. Except for George Baird, Bill MIller and Ferenc Takacs, we were all Eng Phys graduates from UT, although Bell, Schwartz and Vetter were from years earlier than 1960. George was from Queen's University in Northern Ireland and was the only Physics graduate student working with Glenn Reesor and Ian Dagg on experimental physics with microwaves.

Once George and I met, I would give him a ride to UW, as for a while he lived on Park Street, right on my route. Later Herb and George rented a basement apartment in Waterloo. One of their great experiments was to make rice wine. They threw some rice in water and then threw in some raisins. Of course the rice stayed hard as bullets and they ended up with pretty bad raisin (grape?) wine.

All of us took 8 courses (Numerical Analysis, Graph Theory, Control Systems ...), 4 each term to get our Masters degree (an MSc in Applied Mathematics) except for George Baird. In Numerical Analysis, ably taught by Ralph Stanton, we used electric calculators and also learned to program the IBM 610 computer (See Figure 5.4 and https://www.ibm.com/ibm/history/exhibits/vintage/vintage_4506VV4001.html) to solve some problems. The program was punched in paper tape and then passed through a read head to do the computation. In order to make a programming loop to repeat a calculation, we formed the tape in a loop and glued the ends together. This was not the way it was supposed to be done (you were supposed to re-punch the program in a fresh piece of tape), but it was a way to save money.

One highlight of the year was the annual tea party for the graduate students held at either Ken and Pat Fryer's or Gerry and Molly Berman's house (Ken and Gerry were Full Professors of Mathematics). Everybody was dressed in their best while we sipped tea and ate cookies. Ralph

IBM 610 Auto-Point Computer

Figure 5.4
IBM 610 Auto-Point Computer

used to make Dr. Stanton's drops and all graduate students were obliged to eat at least one on pain of not graduating. These cookies were hard as bullets and consisted of chocolate, oatmeal, raisins, nuts and coconut cooked over a double boiler. Ralph once made them at our house in the 80s for our children and a picture of him making them is shown in Figure 5.5.

5.1.2 Home Life

Marg and I were happy in our little apartment. Our landlord, Harold Knechtel, and his family lived in the building. We often drove to Toronto on the weekend to see our respective families when our schedules permitted it. Highway 401 did not make it to Kitchener-Waterloo until 1961, so it was quite a long trek. In fact our first trip was on September 17, one week after our wedding to attend the wedding of Sky Kveps and Tony Capri. Apart from that, our entertainment consisted of going to the odd movie. Trying to get a cup of coffee after a movie in Kitchener-Waterloo in the early 60s was just about impossible, as most of the restaurants closed by 8 or 9pm.

I worked Monday to Friday at UW and studied and marked most weekends. Marg did nursing shift work at Kitchener-Waterloo hospital and sometimes had weekends off. I drove Marg for the night shift and picked her up from the afternoon and night shifts. The rest of the time, she took the Queen Street bus and the King Street trolley coach.

We did most of our grocery shopping at the first and at that time only Zehrs market (Zehrs became a large chain across Ontario and eventually was bought by Loblaws) at Highland Road and West Avenue about 4 blocks from our apartment. It was close, the prices were right, and they

Figure 5.5
Ralph Stanton cooking Dr. Stanton's drops at the Cowan Household in Waterloo in the 1980s

delivered.[2]

When Marg had to work on Saturday, a number of the grad students would go to the Kitchener Farmers market, buy some cheese and salami, a pie, some beer (not from the market) and loaf of Rogenbrot from a delicatessen on Frederick Street. We would retire to our apartment and have a grand Saturday lunch.

Close to Christmas I was driving Marg to work via West Avenue when I was blinded by the high beams of a car coming the other way. Unfortunately I hit a parked car and so we were without a vehicle for a couple of weeks.

Thanks goodness for Zehrs being so close, as Christmas was coming and we had invited Marg's parents, her brother and my Mother to come for Christmas dinner in our small apartment. Fortunately everything worked out, although I do remember George Baird and I going to UW during the Christmas vacation for some reason and having to walk from King Street along Dearborn for about 1 1/2 miles. It was cold. There was no bus to UW at that time.

5.2 1961 - 1964

We moved into 1961 in the final part of my Masters degree. In April UW acquired its first real computer, an IBM 1620 (http://en.wikipedia.org/wiki/IBM_1620) with 20,000 characters of memory and paper tape input and output (see Figure 5.7). Peter Woon and I decided to try programming the computer in GOTRAN,[3] we were spectacularly unsuccessful, but at least I knew how to turn

[2]Now Zehrs and other stores allow you to order your groceries over the Web and they shop and you pick them up.
[3]A simplified version of the FORTRAN langauage

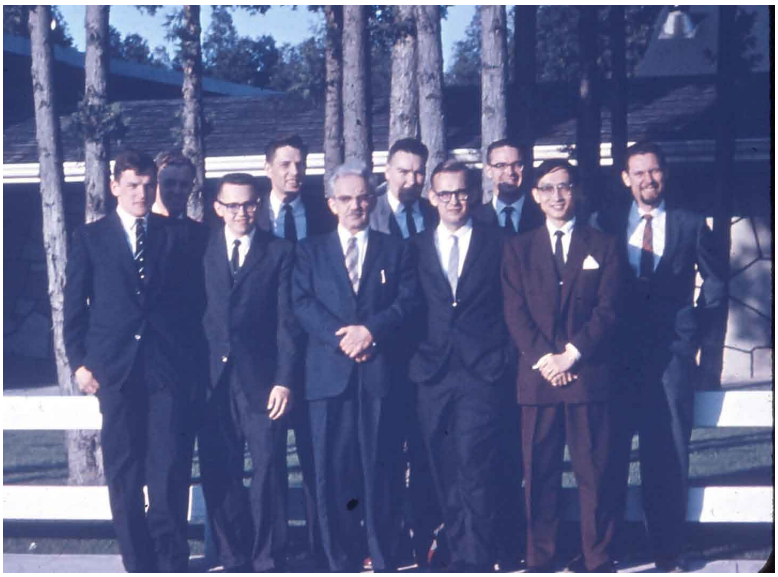


Figure 5.6
UW's second Master's graduates 1961 in front of Leisure Lodge in Preston. Back Row: Harold Bell, Bill Vetter, Jim Corbett, Ian McGee, Herb Schwartz. Front Row: George Baird, John Shewchun, K.B. Jackson (Head of Engineering Physics at UT - honorary degree), Don Cowan, Peter Woon

the machine on. The 1620 did not even have arithmetic circuits but did its arithmetic by looking up the sum of two digits in an addition table just like we were taught in elementary school. The 1620 was jokingly referred to as the CADET which stood for Can't Add and Doesn't Even Try.

Bill Vetter and I applied to Basil Myers, the chair of Electrical Engineering for a lecturer's position. Bill got the job as he was older and had a family to feed; at least that was what Basil said. However, our attempt at using the new computer attracted Ralph Stanton's attention and he offered me the opportunity to help in the new computing centre at a princely salary of $450 per month. Wow!!

I graduated in June 1961 with a Masters degree and then started to help with the Computing Centre. The graduation ceremony was held in the Seagram gym which was part of Seagram Stadium part of UW at the time, but now owned by Wilfrid Laurier University (WLU - the former Waterloo College and Waterloo Lutheran University). The program for convocation is shown in Figure 5.8.

Marg and I had agreed that we would fly to Britain in August and stay for 6 weeks, so that I could meet her English family and also meet some of mine that I had never encountered. I asked for the time away at no pay and Ralph generously agreed. Marg quit her job at Kitchener-Waterloo Hospital[4] and off we went by propeller aircraft to Britain. There were jets in those days, but they were too expensive. The flight was 12 hours to Prestwick airport outside Glasgow, and then another 2 hours to London Heathrow. The airport terminal at Toronto was one small building and you

[4]Since we lived one block form St Mary's hospital, Marg wanted to work there when we returned from our second honeymoon. In those days nurses were in demand and nursing jobs were available.

Figure 5.7
UW's first computer an IBM 1620 with paper tape. Doug Lawson at the console with Wes Graham observing.

walked out to your plane on the tarmac. In those days you dressed in your best clothes for an airplane flight. Marg removed her skirt, she was wearing a slip, so it wouldn't get creased.

How could we afford this expensive trip? Somehow we managed to live on one salary and save the other one, so at the end of the year we had over $2,000 in the bank, which we blew on our second honeymoon.

5.2.1 Touring England and Scotland

Once we arrived in London, we took a train to Cheltenham where we were met by Margaret's Uncle Rag, who drove us in his early 1930s Austin to Tewkesbury where Marg had spent most of the years of World War II. We spent an idyllic few days there with Uncle Rag, Aunt Elsie and daughter Joan. Uncle Rag was Marg's Mother's Uncle and was her maternal grandfather's brother. We then set off on our grand tour of England and Scotland. I don't remember the order, but we visited:

Portsmouth - where we stayed with Marg's Uncle George and Aunt Nellie and I got to meet their son Graeme. George is Marg's Mother's brother. Marg lived in Portsmouth from about 1944 till she immigrated to Canada with her Mother and Brother.

Southend-on-Sea - where we visited Uncle Jack Short (Marg's Father's Brother), Aunt Nellie and cousin Audrey. We also visited Chuck and Christine DesRochers (nee Lloyd). Christine was Marg's Canadian cousin originally from Forest, Ontario, but her husband Chuck was a pilot and at that time was flying across the channel from the Southend Airport.

University of Waterloo

CONVOCATION

for the

Conferment of Degrees

2:30 p.m.

SATURDAY, MAY 27, 1961

The Order of Proceedings

THE AUDIENCE WILL RISE AS THE PROCESSION ENTERS THE HALL.

THE PROCESSION WILL ENTER IN THE FOLLOWING ORDER:

The Graduands
The Representatives of the City Councils
The Board of Governors of the University
The Boards of Governors of the Colleges
The Representatives of the Universities and Colleges
The Administrative Officers of the University
The Senate of the University
The Faculty of the University
The Convocation Chaplain
The Registrar of the University
The Deans of the Faculties
The Heads of the Colleges
The Honourary Graduands
The Chairman of the Board of Governors
The Vice-Chancellor
The Chancellor

GOD SAVE THE QUEEN.

THE CONVOCATION CHAPLAIN WILL OFFER THE PRAYER OF INVOCATION:

Aeterne Deus et clementissime Pater, gratias tibi quam maximas agimus quod nos a fera et agresti vita ad artes ingenuas et scientiarum cognitionem deduxeris, quod domum nostram perpetua largitate et misericordia usque ad hunc diem prosecutus sis, quod viam nobis et veritatem et vitam in Filio tuo indicaveris. suppliciter te, Pater, oramus ut gratia tua adiuvante tuae voluntati semper oboediamus et beneficiis tuis ad gloriam sancti tui nominis utamur, per Iesum Christum, Dominum nostrum.

THE AUDIENCE WILL BE SEATED.

THE VICE-CHANCELLOR WILL REQUEST THE MEMBERS OF THE GRADUATING CLASS TO RISE, AND WILL THEN ADDRESS THE CHANCELLOR:

Mr. Chancellor: I present to you those scholars who have fulfilled the statutory requirements laid down by the Senate of the University, that they may be admitted to their various and several degrees.

THE CHANCELLOR WILL REPLY:

By virtue of the authority vested in me, and in the University, I hereby admit you to your various and several degrees, with all the rights and privileges thereto appertaining.

THE CONFERMENT OF DEGREES.

BACHELOR OF ARTS

presented by . . . . . Rev. J. R. Finn, *Dean, St. Jerome's College*
Professor W. K. Thomas, *Acting Dean of Arts*

GENERAL COURSE

Bruder, Clement August
Bruns, Harold Leonard
Bullis, Barry Richard
Fleurant, Rene Michael
Gerth, Gary Patrick
Hausman, Barbara Ann
Leon, Virginia Anne
Schell, Gerard Arthur
Thompson, Kenneth John
. . . . . .
Stewart, Beverley Clifford

HONOURS COURSE

Hill, Walter David (Mathematics)

BACHELOR OF SCIENCE

presented by . . . Professor W. A. E. McBryde, *Acting Dean of Science*

GENERAL COURSE

Adams, William Grant
Kohli, James David
Mathies, David Arthur
Nicholson, Dorothy Ann

HONOURS COURSE

Manning, Eric George (Mathematics and Physics)

MASTER OF APPLIED SCIENCE

presented by . . . . . Professor R. G. Stanton, *Chairman, Faculty of Graduate Studies*

Miller, William Cousins (Electrical Engineering)
Shewchun, John (Electrical Engineering)
Takacs, Ferenc (Electrical Engineering)
Vetter, William Jacob (Electrical Engineering)

MASTER OF SCIENCE

presented by . . . . . Professor R. G. Stanton *Chairman, Faculty of Graduate Studies*

Bell, Harold Gordon (Applied Mathematics)
Corbett, James Murray (Applied Mathematics)
Cowan, Donald Douglas (Applied Mathematics)
McGee, Ian James (Applied Mathematics)
Reed, Robert Barry (Applied Mathematics)
Schwartz, Herbert John (Applied Mathematics)
Woon, Peter Yi-Do (Applied Mathematics)

THE VICE-CHANCELLOR WILL PRESENT SAMUEL BRONFMAN TO THE THE CHANCELLOR FOR ADMISSION TO THE DEGREE OF DOCTOR OF LAWS, *honoris causa*.

THE VICE-CHANCELLOR WILL PRESENT BARKER FAIRLEY TO THE CHANCELLOR FOR ADMISSION TO THE DEGREE OF DOCTOR OF LETTERS, *honoris causa*.

THE VICE-CHANCELLOR WILL PRESENT WILLIAM JOHN WEBBER TO THE CHANCELLOR FOR ADMISSION TO THE DEGREE OF DOCTOR OF SCIENCE, *honoris causa*.

DR. BARKER FAIRLEY WILL ADDRESS CONVOCATION.

DR. SAMUEL BRONFMAN WILL ADDRESS CONVOCATION.

ANNOUNCEMENTS.

THE CHAPLAIN WILL OFFER THE PRAYER OF BENEDICTION:

Gratia Domini nostri Iesu Christi et caritas Dei et communicatio Spiritus Sancti sit cum omnibus vobis.

THE CHANCELLOR WILL DISMISS CONVOCATION.

THE AUDIENCE WILL RISE AND REMAIN STANDING UNTIL THE PROCESSION HAS RETIRED FROM THE HALL.

Figure 5.9
Upper left: Uncle Rag, Aunt Elsie Perrett - Tewkesbury. Upper right: Cousin Joan Perrett - Tewkesbury. Lower left: Aunt Nellie Kent - Portsmouth. Lower right: Maggie, Auntie Agg - Gloucester. Bottom: Aunt Winnie, Uncle Percy Kent and Family - Finsbury Park, London

Figure 5.10
Upper left: Auntie Belle, Uncle Ern Perrett - London. Upper right: Uncle Jim, Don, Uncle Stanley, Auntie Muriel, Auntie Gwen, Auntie Louise - Bristol. Lower left: Marg, Uncle Jack, Aunt Nellie, Cousin Audrey Short - Southend-on-Sea. Lower right: Aunt Dorothy, Uncle Sid Short - London.

Figure 5.11
Upper left: Uncle Sid, Michael, Aunt Elsie Glazebrook - Derby. Upper right: Aunt Edith, Uncle Fred Hickling - Derby. Lower left: Aunt Florrie and Uncle Bert Bott - Clovelly. Lower right: Martin, Dennis, Doreen and Neil Ritchie - Derby.

London - where we stayed in a hotel near Leicester Square and took in all the sights and theatre where we saw my Fair Lady. We also visited Uncle Ern and Auntie Belle out near Heathrow. Uncle Ern was Uncle Rag's brother. Visits were also paid to Uncle Syd (Marg's Father's brother) and Dorothy and to Aunt Winnie, Uncle Percy and their daughters.

Derby - where we stayed with Uncle Syd and Aunt Elsie and their son Michael and visited with Uncle Fred. Fred was my Grandmother Salt's brother and Elsie was her younger sister.

Edinburgh - where we toured and saw performances of the Tattoo at the Edinburgh Festival.

Bristol - where we visited with other relatives and rented a car (Mini-Minor) which I drove on the "wrong" side of the road to Westward Ho in Devon to visit my Great Aunt Florrie Bott, my maternal Grandmother's sister and her husband Uncle Bert.

Glastobury - where we visited with Uncle Bill and Auntie Chris Perrett. They had moved back to England from Brampton, where he was the Dale Estates orchid superintendent[5].

5.2.2 Other Vacations

We did take two other vacation in the summer of 1962 and 1963 in which we stayed strictly in North America. In 1962 we drove west to Neenah Wisconsin to visit with Sky and Tony Capri. Sky was Marg's roommate from her Nursing training days and Tony was a 1961 Eng Phys grad. We spent a few days with them as well as enjoying the trip out and back. In 1963 we traded our Volkswagen for a Ford Falcon and drove down the East Coast to:

Boston - strictly sightseeing;

Providence - we visited John and Joan Shewchun where John was doing his PhD at Brown;

New Haven - here we spent a couple of days with Ian and Dawna McGee; Ian was doing his PhD at Yale;

New York - we stayed with Peter Woon who had moved to New York to do research with IBM after an attempt at a PhD at Iowa State with Van Allen.[6] Peter did finish a PhD at New York University (NYU).

Philadelphia - our last stop where we attended the ACM National conference and then back home via Scranton Pennsylvania.

5.2.3 Back from the Second Honeymoon for Work and Study

Upon returning to Waterloo, we moved back into the swing of things; I returned to UW and started working with Wes Graham and Marg applied and was hired as a nurse at St Mary's Hospital, right across the street from our apartment. The next 2 1/2 years were relatively quiet. One of my early tasks was working with Doug Wright, the Dean of Engineering,[7] to write a program in assembler

[5] https://archive.macleans.ca/article/1943/3/15/flower-factory

[6] This was the Van Allen who discovered the Asteroid belts that were named after him.

[7] Doug Wright later became President of UW. I still keep in touch with him although he now lives in Toronto.

language to calculate the average marks and some other statistics for all the engineering students. This is how I learned the basics of the computer.

I decided I would like to obtain a PhD and so asked Ralph about the idea. He said "Wait a few weeks and we will start one." Typical Ralph at the time. Of course it didn't hurt that he was Dean of Graduate Studies and could make things happen. I tried working with a number of people such as H.K. Kesavan and W.(Bill) T. Tutte, whom Ralph had lured to UW from UT in 1962. Of course Bill Tutte was famed not only for graph theory and matroids but also as one of the codebreakers at Bletchley Park during World War II.[8] However, no problem appealed to me.

I entered the PhD program and helped Wes Graham with the computing centre, as we tried to figure out how to teach students about using computers for engineering calculations. Our first attempt was a disaster. We asked engineering professors to supply us with problems. They were much too hard and solving them was limited by the software we had. The problem we faced was very simple, but extremely challenging to solve. It would take a long time to get the program into a state where it could be run on the computer, and if an error was made there was a very complicated description for the error making it almost impossible for a student to find the specific mistake. Since students were learning, errors were quite common. Back to this problem and its solution later.

In 1962 Ralph offered me a job as a lecturer in Mathematics where that Fall I would teach Algebra and Numerical Methods to Engineers. Once I had a year or two of teaching, he trusted me to teach math students.

In winter of 1963, I went to the doctor to a get shot for something. Since my wife was the office nurse,[9] she had the pleasure of administering the shot in my backside. Bob then talked with me and pointed out that I was perfectly healthy, but too damned fat. Marg immediately put me on diet and I lost 35 pounds in month, going from 195 to 160 pounds under my wife's excellent supervision.

In the summer of 1963, Ralph and Gus German (a very bright undergraduate student) went to the University of Wisconsin (one of the other UWs) for study leave. Gus discovered a program for the IBM 1620 called FORGO that solved the problems with teaching about computers that I mentioned earlier. Preparation of the program was much easier and faster and the errors were clearly indicated.

Gus brought a copy back to UW and we started using it. What a difference!! By this time the IBM 1620 used 80-column cards (a typical card is shown in Figure 5.12) directly for input and had 40,000 characters of memory. We could easily process hundreds of student programs a day and the students could quickly find their errors.

At this time the UW acquired an IBM 7040, which cost $1,000,000; it was to be used for research and data processing, not for student computing, but that would change by the Fall of 1965. A picture of the front console of the Machine is show in Figure 5.13.

I remember Gerry Hagey, the President of UW bringing a visitor around and asking Wes to show the visitor the computer. When the door opened, Hagey exclaimed "We bought that." Remember that Waterloo only had about 2,000 students at the time.

Wes was always issuing challenges. Two such were the one-card loader and the 40 column card which I will attempt to explain as I solved both of them.

Each instruction on the IBM 1620 was 12 characters long and if you could put an instruction on a card with the instructions to put them in a specific location in memory then we could more easily

[8] Bill cracked the Lorenz code far more complex than Enigma solved by Alan Turing - https://billtuttememorialfund.wordpress.com/2013/05/23/bill-who/

[9] Marg had left St. Mary's hospital to work for Bob Carlyle, a local doctor

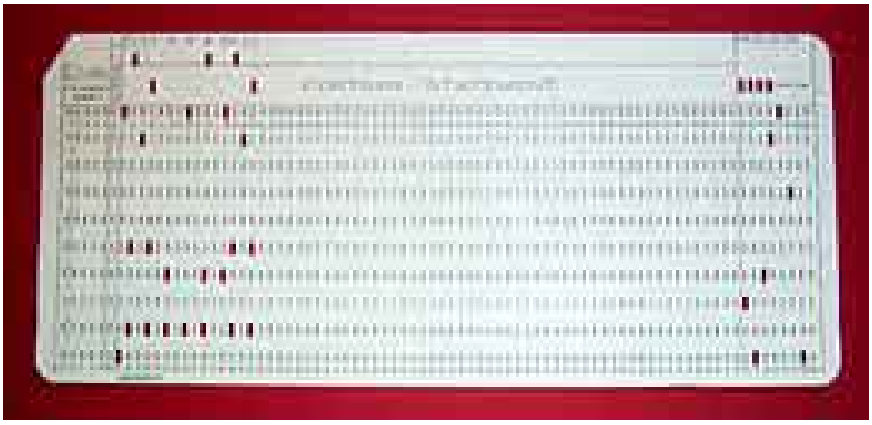


Figure 5.12
Card from a Fortran program: Z(1) = Y + W(1)

Figure 5.13
The Console of the IBM 7040

change programs. Wes claimed it couldn't be done for the IBM 1620. Of course I set out to prove him wrong, which of course was the point. It took a couple of days but I solved the problem.

At that time a student's program would punch the answer into cards, which were then carried to a printer called an IBM 407 (see Figure 5.14). Wes then observed that most of the time students rarely used more that 40 of the 80 columns in the card to record their answers. Since budgets were tight, we thought we could save half of the card budget by forcing the students' programs to punch a second card if they exceeded the 40 columns. We then modified the FORGO processor using the one-card loader to perform this little task. After the cards were punched once, they were reversed and used again. However, one little problem, sometimes the students forgot to reverse the cards and so they were punched twice in the same columns. So much for that idea.

5.2.4 The Mathematics Contests

In April 1963 the first Mathematics contests were offered to schools in Ontario School District 10 and jointly sponsored by District 10 and the UW. The team working on the contests consisted of Ron Dunkley, Ed Anderson, Don Attridge and Bill Nediger ably assisted by Ralph Stanton and Ken Fryer. The contests moved to the UW shortly after the first contest was written. Writing the contests is now an annual event and as of 2019, there are about 260,000 students in Canada and abroad writing them. I became involved in 1968 when Ron Dunkley, a friend for over 50 years, moved to the University of Waterloo and I helped automate much of the marking and production of results. I joined the contest team as their computer expert and became quite involved in setting up the Waterloo Mathematics Foundation in which I served twice as President. The Foundation currently donates between $50,000 and $100,000 to the Mathematics Faculty each year for scholarships.

5.2.5 Computer Science Days

We often had high schools wanting to come to UW to see our computers, and so in 1964, Wes Graham thought we should formalize the procedure and invite every high school in Ontario (there were about 700) to send students. We would schedule them on a Saturday and handle up to 200 students in each session. Paul Cress created a language called TUTOR so that we could teach programming in about 45 minutes. These Computer Science Days consisted of two lectures on programming (introductory and advanced) followed by a lecture on careers. We literally filled every Saturday from mid-September to end of May. I taught the first one single-handed, running between lectures; wow, it was exciting and exhausting at the same time. These visits continued up to the 1990s with different content; there were up to 10,000 students who visited Waterloo in some years. What a great way to make contact with the high schools and attract bright students.

Wes and I came up with the idea for Computer Science Days in his office one afternoon in 1964. We immediately went down the hall to Ralph Stanton's office and told him about the concept. Ralph's comment was "what a stupid idea," so we retreated with our tails between our legs. Ten minutes later, Ralph was in Wes's office telling us about his great idea for Computer Science Days. He was repeating what we had told him. Such was the fun of working with Ralph.

5.2.6 Our First House - 197 Mayfield Avenue

In 1963 Marg and I started looking at houses in the Forest Heights area of Kitchener, but decided not to buy one. In 1964 Wes Graham and I were working late one night, when he asked me if I

Figure 5.14
An IBM 407 Accounting Machine

Figure 5.15
Marg at our first house - 197 Mayfield

would like to buy his house (a bungalow) at 197 Mayfield Avenue in Waterloo for the same price he paid for it in 1960 ($14,000). Wes and Helen Graham were building a bigger house in Kitchener to house their growing family. I agreed on the spot, went home, woke up my wife and told her we had just bought a house.[10] Fortunately she was pleased. We moved in April of 1964.

5.3 1965

At this time Ralph trusted me enough to allow me to offer a graduate course in Numerical Analysis. In one class I suggested a problem about Unilateral Equations and then continued to teach the normal topics. I was still struggling with my PhD topic and working with Gerry Berman[11] on optimization, when Ralph entered Gerry's office and asked if this work on Unilateral Equations could be published, as one of the students in my class had approached Ralph about it. I immediately claimed the work as originating with me; at last I had found my PhD topic.

In February, Marg and I were visiting our friends, Vir and Silvana Handa. While returning home driving along Glasgow Street, we were in a collision. Marg was fine, but my face hit the steering wheel and was badly smashed up. I had reconstructive surgery to rebuild my left cheek bone and my mouth was wired shut for several weeks while it healed. The impact also removed about 4 of my teeth and so I have worn a partial plate ever since.

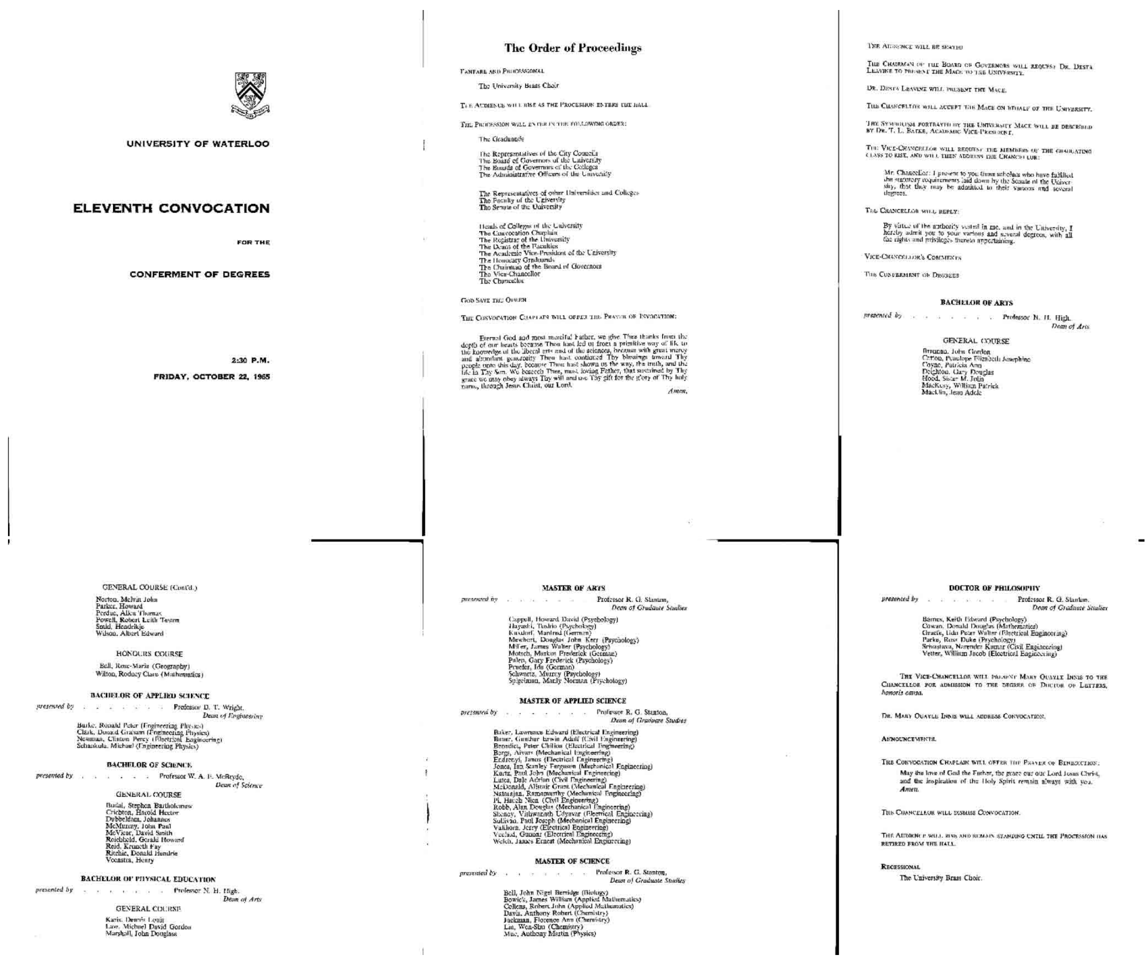
I was able to get back to my thesis work and make great progress; everything seemed to click into place. I even received help from an unexpected source, namely Maurice Flower. Maurice was a numerical analyst visiting UW from the University of Bristol that summer. I wrote my thesis during the month of August, had my orals and defended the thesis in early September, and fortunately I passed.

Just as I was finishing my thesis, a tragedy overtook the Salt family. My uncle Donald Salt who had been an idol and a mentor to me as I had progressed through high school and Engineering Physics[12] had become ill in 1964 with cancer of the kidney. He had been operated upon and I was kept in the dark as to his real condition; this seems to be a Salt family trait.

We received a call in mid-August from my Mother who told us that if I wanted to see my uncle alive, I should immediately drive to Toronto and visit him in the hospital. Marg and I did that and actually stayed the night in the hospital. Marg sat up with my Uncle and I slept on some kind of table. My uncle was till alive in the morning and so we returned to Waterloo. No sooner did we arrive, then we received a phone call telling us he had died. Here was my Aunt Ann, Donald's wife left with three young children (Mary, David and John) to raise. She became a teacher and did a marvelous job raising her children until she married Maurice Crawford and created a blended family of 7 children.

I was appointed as an Assistant Professor of Mathematics at UW and received my PhD at the October convocation that year. See Figure 5.16 for a copy of the convocation program. I was UW's 6th PhD. My predecessors were Carl Turkstra, Peter Roe, Vir Handa, Doug Lawson, and Ron Mullin. At the same time I was made Associate Director of the UW Computing Centre.

[10] She had visited the house quite a few times and so knew what it looked like.
[11] https://uwaterloo.ca/combinatorics-and-optimization/about/professor-berman
[12] I followed Donald into Engineering Physics; he had enrolled in 1944 and graduated in 1948.



UNIVERSITY OF WATERLOO

ELEVENTH CONVOCATION

FOR THE

CONFERMENT OF DEGREES

2:30 P.M.

FRIDAY, OCTOBER 22, 1965

The Order of Proceedings

FANFARE AND PROCESSIONAL

The University Brass Choir

THE AUDIENCE WILL RISE AS THE PROCESSION ENTERS THE HALL

THE PROCESSION WILL ENTER IN THE FOLLOWING ORDER:

The Graduands

The Representatives of the City Councils
The Board of Governors of the University
The Boards of Governors of the Colleges
The Administrative Officers of the University

The Representatives of other Universities and Colleges
The Faculty of the University
The Senate of the University

Heads of Colleges of the University
The Convocation Chaplain
The Registrar of the University
The Deans of the Faculties
The Academic Vice-President of the University
The Honorary Graduands
The Chairman of the Board of Governors
The Vice-Chancellor
The Chancellor

GOD SAVE THE QUEEN

THE CONVOCATION CHAPLAIN WILL OFFER THE PRAYER OF INVOCATION:

Eternal God and most merciful Father, we give Thee thanks from the depth of our hearts because Thou hast led us from a primitive way of life to the knowledge of the liberal arts and of the sciences, because with great mercy and abundant generosity Thou hast continued Thy blessings toward Thy people unto this day, because Thou hast shown us the way, the truth, and the life in Thy Son. We beseech Thee, most loving Father, that sustained by Thy grace we may obey always Thy will and use Thy gift for the glory of Thy holy name, through Jesus Christ, our Lord.

Amen.

THE AUDIENCE WILL BE SEATED

THE CHAIRMAN OF THE BOARD OF GOVERNORS WILL REQUEST DR. DESTA LEAVINE TO PRESENT THE MACE TO THE UNIVERSITY.

DR. DESTA LEAVINE WILL PRESENT THE MACE.

THE CHANCELLOR WILL ACCEPT THE MACE ON BEHALF OF THE UNIVERSITY.

THE SYMBOLISM PORTRAYED BY THE UNIVERSITY MACE WILL BE DESCRIBED BY DR. T. L. BATKE, ACADEMIC VICE-PRESIDENT.

THE VICE-CHANCELLOR WILL REQUEST THE MEMBERS OF THE GRADUATING CLASS TO RISE, AND WILL THEN ADDRESS THE CHANCELLOR:

Mr. Chancellor: I present to you these scholars who have fulfilled the statutory requirements laid down by the Senate of the University, that they may be admitted to their various and several degrees.

THE CHANCELLOR WILL REPLY:

By virtue of the authority vested in me, and in the University, I hereby admit you to your various and several degrees, with all the rights and privileges thereto appertaining.

VICE-CHANCELLOR'S COMMENTS

THE CONFERMENT OF DEGREES

BACHELOR OF ARTS

presented by . . . . Professor N. H. High,
Dean of Arts

GENERAL COURSE

Brunner, John Gordon
Catton, Penelope Elizabeth Josephine
Coyne, Patricia Ann
Deighton, Gary Douglas
Hood, Sister M. Julia
MacKay, William Patrick
Macklin, Jean Adele

GENERAL COURSE (Cont'd.)

Norton, Melvin John
Parker, Howard
Perdue, Allen Thomas
Powell, Robert Leith Teston
Smid, Hendrikje
Wilson, Albert Edward

HONOURS COURSE

Bell, Rose-Marie (Geography)
Wilton, Rodney Clare (Mathematics)

BACHELOR OF APPLIED SCIENCE

presented by . . . . Professor D. T. Wright,
Dean of Engineering

Burke, Ronald Peter (Engineering Physics)
Clark, Donald Graham (Engineering Physics)
Newman, Clinton Percy (Electrical Engineering)
Schankula, Michael (Engineering Physics)

BACHELOR OF SCIENCE

presented by . . . . Professor W. A. E. McBryde,
Dean of Science

GENERAL COURSE

Budai, Stephen Bartholomew
Crichton, Harold Hector
Dubbeldam, Johannes
McMurray, John Paul
McVicar, David Smith
Reichbold, Gerald Howard
Reid, Kenneth Fay
Ritchie, Donald Hendrie
Voorstra, Henry

BACHELOR OF PHYSICAL EDUCATION

presented by . . . . Professor N. H. High,
Dean of Arts

GENERAL COURSE

Karis, Dennis Louis
Law, Michael David Gordon
Marshall, John Douglass

MASTER OF ARTS

presented by . . . . Professor R. G. Stanton,
Dean of Graduate Studies

Cappell, Howard David (Psychology)
Hayashi, Toshio (Psychology)
Kuxdorf, Manfred (German)
Mewhort, Douglas John Kerr (Psychology)
Miller, James Walter (Psychology)
Motsch, Markus Frederick (German)
Palen, Gary Frederick (Psychology)
Pruefer, Ida (German)
Schwartz, Murray (Psychology)
Spigelman, Marly Norman (Psychology)

MASTER OF APPLIED SCIENCE

presented by . . . . Professor R. G. Stanton,
Dean of Graduate Studies

Baker, Lawrence Edward (Electrical Engineering)
Bauer, Gunther Erwin Adolf (Civil Engineering)
Benedict, Peter Chilton (Electrical Engineering)
Bergs, Aivars (Mechanical Engineering)
Endrenyi, Janos (Electrical Engineering)
Jones, Ian Stanley Ferguson (Mechanical Engineering)
Kurtz, Paul John (Mechanical Engineering)
Lutes, Dale Adrian (Civil Engineering)
McDonald, Alistair Grant (Mechanical Engineering)
Natarajan, Ramamurthy (Mechanical Engineering)
Pi, Hatch Nien (Civil Engineering)
Robb, Alan Douglas (Mechanical Engineering)
Shenoy, Vishwanath Udyavar (Electrical Engineering)
Sullivan, Paul Joseph (Mechanical Engineering)
Valthora, Jerry (Electrical Engineering)
Veeland, Gunnar (Electrical Engineering)
Welch, James Ernest (Mechanical Engineering)

MASTER OF SCIENCE

presented by . . . . Professor R. G. Stanton,
Dean of Graduate Studies

Bell, John Nigel Berridge (Biology)
Bowick, James William (Applied Mathematics)
Collens, Robert John (Applied Mathematics)
Davis, Anthony Robert (Chemistry)
Jackman, Florence Ann (Chemistry)
Lai, Wen-Shu (Chemistry)
Muc, Anthony Martin (Physics)

DOCTOR OF PHILOSOPHY

presented by . . . . Professor R. G. Stanton,
Dean of Graduate Studies

Barnes, Keith Edward (Psychology)
Cowan, Donald Douglas (Mathematics)
Graefe, Udo Peter Walter (Electrical Engineering)
Parke, Ross Duke (Psychology)
Srivastava, Narendra Kumar (Civil Engineering)
Vetter, William Jacob (Electrical Engineering)

THE VICE-CHANCELLOR WILL PRESENT MARY QUAYLE INNIS TO THE CHANCELLOR FOR ADMISSION TO THE DEGREE OF DOCTOR OF LETTERS, *honoris causa.*

DR. MARY QUAYLE INNIS WILL ADDRESS CONVOCATION.

ANNOUNCEMENTS.

THE CONVOCATION CHAPLAIN WILL OFFER THE PRAYER OF BENEDICTION:

May the love of God the Father, the grace of our Lord Jesus Christ, and the inspiration of the Holy Spirit remain always with you. *Amen.*

THE CHANCELLOR WILL DISMISS CONVOCATION.

THE AUDIENCE WILL RISE AND REMAIN STANDING UNTIL THE PROCESSION HAS RETIRED FROM THE HALL.

RECESSIONAL

The University Brass Choir.

Figure 5.16
The 1965 Convocation Program

5.3.1 WATFOR

During the summer of 1965, Peter Shantz, a lecturer in Mathematics and four undergraduate students: Richard Shirley, Angus German, James Mitchell and Bob Zarnke all conspired to write WATFOR, the successor to FORGO with similar characteristics, but even better performance. They convinced Wes Graham that they could produce this piece of software in less than four months. I was skeptical, but they did it; it usually took a year to create such software. WATFOR was an instant success and was distributed to over 20 universities by the Fall of 1965. UW's reputation in Computer Science was on the rise.

Wes wanted to distribute WATFOR for free, but I convinced him that we should charge, so that we could afford to fix any problems that might arise, as new software usually has errors or bugs. We started at a one-time charge of $300, so we could properly maintain the software. After a couple of years the charge became $300 per year. Contrast this with IBM's software for the same function that cost $10,000 per year and was not appropriate for educational use.

5.3.2 John Donald Cowan

In late 1964 Marg and I decided to adopt children to make our little family and so we applied through the local childrens aid society. We were approved and our first child is John Donald Cowan born September 7, 1965 and named after his grandfather Cowan. He came to us in November 1965 when he was two months old. He was baptized by the Reverend Roy Webb on Christmas Day 1965 at St George's Anglican Church in Kitchener, when the entire family could be present. His Godparents are Jim and Joan Corbett. More about John and the rest of our family later.

5.4 1966

5.4.1 Forming the Faculty of Mathematics

1966 looked like a normal year, we had started our family and I was teaching and trying to start a research program in Computer Science. However, things were about to change. Mathematics was in the Faculty of Arts and was the largest department by far. Ralph Stanton had decided to leave the Faculty of Arts and form a Faculty of Mathematics, a new concept in the world, not just new to UW.

We were all told by Ralph Stanton to show up at the Faculty of Arts meeting when the vote was held and Ralph made sure we all knew which way to vote. The meeting occurred and now we were on our way with the approval of the UW Senate. We now were forming a Faculty with four departments (Applied Mathematics, Computer Science, Pure Mathematics and Statistics). Gerry Berman came up with a fifth department which was initially called Operations Research, but was later renamed Combinatorics and Optimization, as Gerry corralled all the graph and combinatorics theorists in the Faculty.

It was decided that Mathematics should have its own building and so we submitted a proposal to the Ontario Government for a $5,000,000 building. To pay for a building in those days the university raised 10% of the cost and then the government of Ontario would provide 90%. This included furniture. At the time Wes Graham and I were meeting to create the computer part of the

Figure 5.17
Mathematics and Computer Building

proposal for the new building.[13] Wes suddenly suggested that computers were just furniture and so we submitted a proposal for a $5,000,000 building with furnishings worth over $8,000,000. The computer was an IBM 360 Model 75 shown in Figure 5.18, Canada's largest computer; remember UW had only a 4 or 5 thousand students at the time.

Bill Davis, then Ontario Education Minister, was a guest speaker at one of our local Canadian Information Processing Society (CIPS) chapter meetings and at the end of his speech announced that he had approved the $13,000,000 project. Wow, a $5M building containing $8M in furniture. The room went wild and we had a great party that night. It should be noted that about a year later when the other Ontario universities figured out what we had pulled off, the Ontario Government pulled the computer portion of the building. However, although UW had to return the money, the terms were very generous. This made it possible for UW to dig into its budget and pay for the computer from operating funds, still a gutsy move at the time by both the UW administration and the Ontario Government and one that helped establish UW as an up-and-comer in the new and dynamic field of Computer Science.

Almost immediately after this announcement we received an interim IBM 360 Model 40 so we could get up to speed on operations. In addition, we had decided to create WATFOR for the IBM 360 line of computers. This team was lead by Paul Dirksen and Paul Cress. When it was announced, UW's reputation was enhanced even more as this piece of software was distributed to thousands of locations around the globe.

5.4.2 Canadian Information Processing Society

In 1966 I was the President of Grand Valley Chapter of the CIPS. Our chapter had agreed to host the CIPS one-day annual meeting; in alternate years CIPS held a three-day conference. We held the conference at Prudhomme resort near St Catherines Ontario and everything went well until Marg

[13]There was a large computer room designed into the building, but we had to figure out what computer to buy and how to pay for it.

Figure 5.18
An IBM 360 Model 75 Computer with Burt Matthews (President of UW), Paul Dirksen and Wes Graham

and Marian Wilson decided to go riding on horseback. Marg fell off and broke her ankle. God bless her, she did not tell me till after the conference was over, but it did put her on the injured list for several weeks. Fortunately Helen Graham stepped up and helped to take care of son John.

In 1968 I was elected to be second vice president of the Canadian CIPS organization. It was suggested that I should run for President in 1970 but turned down the opportunity as I was still building the department.

5.4.3 Installing the 360 Model 75

In 1966, Wes Graham had been invited by IBM Americas to tour Latin America and give talks about our accomplishments in Waterloo, particulary our success with teaching students how to program using WATFOR. One of his stops was Rio de Janeiro in Brazil where he made contact with IBM Brazil and the Pontifical Catholic University of Rio (PUC-Rio), a relationship that has lasted for over 50 years, but more on this later.

While Wes was in Latin America, the IBM 360 Model 75 arrived and was installed in the Physics Building, as the Math and Computer Building was still under construction. This was my job as Associate Director of the Computing Centre.

In addition, the new Math and Computer Building was under construction and it was my job in Wes's absence to guide the design of the two-story computer room in the new building. There was much back and forth with the interior designer who wanted to tile the room in red tiles; the second floor was to be all glass so that visitors could look down on the computer. The designer also wanted a computer with red panels. I had visions of people completely disoriented and walking into the computer, as they could not distinguish between walls, floor and machine. We finally agreed on red for the room and blue panels for the machine. Of course the computer room became known as the "red room" (see Figure 5.19).

Figure 5.19
The Red Room (Computer Room) in the Mathematics and Computer Building

5.4.4 Becoming Chairman of Computer Science

We had been busily seeking a chairman for the new Computer Science Department, but although we had almost attracted one or two very good people, we had struck out. During the summer I had just returned from a conference and encountered Wes Graham in the hall. He informed me that Ralph Stanton wanted to see me. I thought "What have I done now?" and decided to go to Ralph's office and get the agony over.

As I entered, Ralph offered me a chair and I thought that things couldn't be too bad. In the next minute I was offered the Chairman's position in Computer Science, a promotion to Associate Professor and a raise, all to take effect on July 1, 1967.[14] In the meantime I became the Chair of the Computer Science Division in the Department of Mathematics. At that time, the Division had three professors (Graham, Lawson and Cowan) and two lecturers (Cress and Dirksen). Here I am: one year out of graduate school, 28 years old and running a department. I accepted on the spot and then told my wife. The next 6 years were exciting as we shall soon see.

Later in the summer I journeyed to the University of Edinburgh for 3 weeks to attend a NATO summer school on Computer Science. Many of the luminaries of the field were there giving lectures (Edsger Dijkstra, Alan Perlis, John McCarthy, C.A.R. (Tony) Hoare). Some of these became personal friends over the years. It was a fantastic experience and I made my first hire, a Norwegian by the name of Jan Kent. Jan only spent about two terms with us, once he arrived in September.

In September 1966, Ralph Stanton called us all together: 5 Chairmen (Peter Ponzo, Gerry Berman, Don Cowan, Doug Wertheim and Dave Sprott) and two Associate Deans (Arthur Beaumont, Ken Fryer) to announce that he was leaving UW. You can imagine the shock that reverberated around the room, as our leader and founder of the Faculty announced his departure. However, as can be seen from the results of today, we managed to grow the Faculty into a very powerful unit, likely the largest mathematics unit in the world.[15] After a short stay at York University of about a year, Ralph moved to the University of Manitoba where he was the head of Computer Science for

[14] The actual date was changed later to January 1, 1967.
[15] Of course, Ralph laid the foundation for that growth with his many moves in the early 60s.

many years. He was still teaching until just before his death in April 2010. I think we always knew that Ralph was looking over our shoulder guiding us from Winnipeg. He was always there to help and was a great friend and mentor,

IBM Brazil had given PUC-Rio an IBM 7044 computer and were anxious to train some faculty from that University on the computer's operation and how to use it effectively. IBM contacted UW because of Wes's visit earlier in the year and asked if we would host people from PUC-Rio. Wes said yes and the first Brazilian, Luis Martins, the IBM PUC-Rio marketing rep, arrived at UW in November as an advance party. Dressed in his Brazilian business suit, his first comment was "I am Luis Martins from IBM Brazil, I will come back tomorrow after I buy a coat."

5.5 1967

1967 started with a Brazilian twist (or should I say Samba - the twist was a dance from the 60s). Our first people from PUC-Rio arrived in Waterloo at the beginning of January to learn about how we operated the IBM 7040 and to stay for about 3 months. There were two people, Carlos Lucena (http://www-di.inf.puc-rio.br/ lucena/bio_eng.html) and Wilfried Probst. Carlos and I have worked together since that time and in the last two decades up till 2013,[16] he has come to the UW each winter for 2 1/2 months to do joint research. In fact our families are quite close. At the time Carlos wife Marisa was pregnant with Alex their first child, and so there was constant telephone communication between Waterloo and Rio. Alex was born in April 1967.

I remember we had a party at Wes Graham's house with a Brazilian IBM manager, Fernando Rodriguez, in attendance. Ralph was in town and attended the party as well. He then challenged Fernando Rodriguez to a Portuguese poetry reciting contest and then proceeded to recite "Os Lusadas" Portugal's epic poem. Ralph won hands down (he was fluent in Portuguese and had an extensive Portuguese library[17]). My Mother attended the same party, she was greeted by Fernando who kissed her hand. She exclaimed over that for days.

In the meantime I was gearing up to staff the fledgling Computer Science Department, expand the undergraduate curriculum, and establish a graduate program. John Brzozowski,[18] who was at the University of Ottawa and a world-class computer theoretician wrote to me, visited Waterloo to give a seminar and was recruited to join the fledgling department in 1967, its first year of operation. Once John joined that Fall, we sprang into full recruiting mode, wining and dining individuals to try and attract them to Waterloo. John was particularly well connected in computer science theory and worked that group very well. With all the entertaining, boy did I get fat!!

Marg pitched in with much of the entertaining as we tried to lure other individuals to UW. She was a great support and fantastic help as we both learned how to attract people. We often entertained people in our little house with plates on their knees in the living room. It was about this time, that we started wondering about a larger house. At some point we also decided on a larger car and traded our Ford Falcon for a 1967 Ford station wagon.

In September 1967, Marg, her Father and I went to Montreal for Expo67. It was a fantastic experience. The only problem,was that it was the beginning of the first year of the Faculty of

[16] Carlos stopped coming in 2013 as he suffered a stroke. However, he continues to run his research lab and we still share students and do joint research.

[17] Ralph spent a year in Brazil in 1948.

[18] John moved into a house on Shakespeare Drive, the same street I moved to 6 months later. Unfortunately he died from cancer in October 2019

Mathematics and I should not have left town. Arthur Beaumont, the Associate Dean and a good friend pointed out the error of my ways. However, there were no dire consequences.

5.5.1 Michael David Cowan

With all the excitement of building a department, Marg and I decided to expand our family. The latest addition was Michael David Cowan, born November 5, 1967 (Guy Fawkes Day). He came to us on December 18, 1967 just before Christmas when he was 1 1/2 months old. What a Christmas present!! Like John, he was baptized by the Reverend Roy Webb on Christmas Day 1967 at St George's Anglican Church in Kitchener, when the entire family could be present. His Godparents are Roger and Connie Green. More about Mike and John and the rest of our family later.

5.6 1968

The Brazilians came back. The Brazilians returned to Waterloo in the winter of 1968 to expand their team and its training. This time there was Carlos Lucena with his wife Marisa, Raphael Barbosa da Silva with his wife Gilda and Arndt von Staa (he would marry his wife Carla in 1969). They worked hard for 3 months. Carlos asked me how he could get a Masters degree (MMath) and I suggested he take courses while he was here, and then write a thesis in Brazil and submit it. It worked and Carlos became one of my first graduate students. The Brazilians kept asking when I would come to Rio and I replied "If they could find the money, I would come." The opportunity came in 1969 sooner than I expected.

Other people we worked on in early 1968 were Eric Manning, Charlotte and Pat Fischer and Jim Linders. I knew Eric as he was a fourth year student at Waterloo, when I arrived in 1960; he stayed for a Masters degree and then did a PhD at the University of Illinois. Jim was a classmate of mine from Eng Phys. whom I encountered in the hall at UW where he was using our computers to work on the foundations of computerized mapping later to become geographic information systems (GIS). I worked on hiring Jim Linders for a couple of years while visiting him and his wife Jean in England. Pat and Charlotte Fischer were found by John Brozozowski. Janos Aczél approached about joining our department as he was uncomfortable in Pure Math; he requested that the Department change its name to Applied Analysis and Computer Science, which we did. Janos eventually returned to Pure Math in the mid 70s. Janos also introduced me to Tom Pietrzykowski who was a refugee computer scientist from Poland via Paris.

5.6.1 WATBOL

In 1968 we decided that since our students were working in business positions on their cooperative work terms that they should learn about processing business data while in the classroom. Business programs were typically written in a language called the COmmon Business-Oriented Language or COBOL. This decision resulted in the WATBOL software system (http://en.wikipedia.org/wiki/WATBOL) with the same properties as WATFOR, fast translation and clear error messages. In addition we created a related course taught by Cowan, Dirksen and Graham, and a book "An Introduction to COBOL and WATBOL" by Don Cowan, Paul Dirksen and Wes Graham.

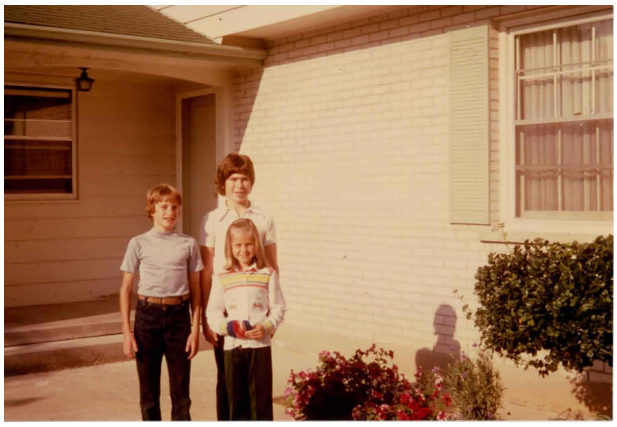


Figure 5.20
276 Shakespeare Drive

5.6.2 Our Next House - 276 Shakespeare Drive

We had made the decision to move to a larger house; now it was time to find one. We enlisted the help of Dave Taylor, who had come to work as the Department Chair's administrative assistant after he had retired from Bell, and who loved to do building inspections. After several false starts we found 276 Shakespeare Drive in the Beechwood area right beside UW. From the street the house looked like a split-level, but it was actually a two-story with attached garage. The owner was Harold Reese, who later started Reese Cleaners in Kitchener-Waterloo.

We made a conditional offer for the house ($44,000) on the condition we could get $24,000 for our house on Mayfield. Harold was anxious to sell and so after a few days he offered us our asking price, sight unseen. His theory was that he could sell a lower-priced house faster. We effectively swapped houses and moved on the same day. It was a bit of a logistics nightmare, but it worked.

5.6.3 Speaking Tour of Europe

I had been invited by IBM Europe to tour several countries in Europe in 1968 speaking about WATFOR and the UW experience in Computer Science. I left just after we had moved. Here was Marg with two young children, almost 3 and 1 1/2 and a brand new house to manage; she stepped up to the challenge. I visited England, the Netherlands where I contacted and visited my friend Edsger Dijkstra, West Germany and Switzerland. We skipped France as the students were rioting in Paris and it was not considered safe.

5.6.4 IFIP 1968

No sooner did I come back from Europe, then I was off to Edinburgh for the International Federation of Information Processing Conference (IFIP), this big event was held every three years. This was special because UW and its success with software was featured in the keynote address given by

Sidney Michaelson, a University of Edinburgh Professor and one of the leading computer scientists at that time.

5.7 1969

5.7.1 Jamaica

The year 1969 started as a hot time. Ron Read, a Professor at the University of the West Indies (UWI) in Kingston Jamaica (Ron later joined UW in Combinatorics and Optimization) decided to hold a graph theory (I have always been interested in research in graph theory) conference at UWI. Off we went with spouses and spent a delightful week in Kingston followed by a week's vacation at Casa Maria in Port Maria and a day or two in Montego Bay, both on the north coast of Jamaica. Then back to Waterloo for the usual teaching and recruiting new faculty.

5.7.2 Morven Gentleman

Early that year Morven Gentleman walked into my office from Bell Labs and announced he was looking for a job. Morven had a fantastic background, PhD from Princeton, working with John Tukey, followed by a research position at Bell Labs. We hired Morven on the spot. Morven[19] is a Canadian from Alberta and is now retired from Dalhousie University in Halifax.

5.7.3 Brazil

The National Research Council of Canada (NRC) announced that an agreement had been reached with the National Research Council of Brazil (Conselho Nacional de Pesquisa - CNPq) to support researchers from Canada who wished to journey to Brazil and work with individuals. I applied for funding and was accepted, and arranged to go to Brazil for May and June of 1969. Marg would meet me for the month of June, leaving the two boys in the hands of a very competent baby sitter.

I arranged for Eric Manning to act as Chairman and off I went to Brazil. I flew Varig Airlines; even in economy they served individual courses on china plates with real cutlery.

I stayed in a small hotel in Copacabana just down the street from my friend Carlos Lucena. I did joint research with a number of people including research with Carlos and Arndt von Staa and advised on ways that they might run their computer centre. On the weekends we would eat Feijoada, a Brazilian stew of beans with beef and pork, and play Volleyball on the beach (now an Olympic Sport).

Marg arrived in early June and we had a great time. One weekend we went to Raphael Barbosa da Silva's Father's fazenda, a very large plantation. Other weekends were spent visiting the sights of Rio and surroundings such as Corcovado (the statue of Christ), Santa Teresa, Pao d'Acucar (Sugar Loaf), a favela (a large slum) and the cities of Teresopolis and Petropolis. We also attended the wedding of Arndt and Carla von Staa.

We had an opportunity to visit Brasilia, the new capital, as I was invited to give a talk at the University of Brasilia. We flew from Rio, but when we arrived the students were rioting (sound familiar), and so we were given a tour. The tour was conducted by the only employee of the Canadian Embassy, as the staff had not yet moved from Rio, the former capital.

[19] Morven died in late December 2018 and I attended a memorial service for him in Halifax in May 2019.

Figure 5.21
Don and Marg on a carriage ride in Petropolis near Rio

While in Brazil I was invited by the Organization of American States (OAS) to join a team consisting of an American (Dick Spann), a Brazilian (Antonio Olinto) and a Canadian (Don Cowan) to do a survey of computer science departments in Latin America. At this point Marg decided to return home to take care of our two boys. We visited PUC-Rio, ITA in Sao Jose dos Campos, the University of Sao Paulo, the University of Buenos Aires, the University of Chile in Santiago, the University of Lima, the University of Caracas and the University of Mexico.

We then journeyed on to Washington where we constructed our report. Of course all three of us got sick in Mexico. We were taken out for strawberries and cream by our Mexican host; why we ate them I will never know. I guess he seemed trustworthy. We were all sick as we flew from Mexico City to Washington, a thoroughly unpleasant flight.

5.7.4 Italy

No sooner had I returned home, then I was off to Italy for a week to participate in a conference arranged by IBM Italy and Bruno Forte (Bruno later joined the UW Applied Math Department) at a beautiful resort near Milan. My job was to talk about Computer Science in Canada. After that I returned to UW and went back into teaching, research and recruiting.

5.7.5 CANUNET

Finally at the end of 1969, I was approached by Doug Parkhill (https://en.wikipedia.org/wiki/Douglas_Parkhill), Deputy Minister of Communications to work on a committee with Kelly Gotlieb and Joe Reid among others to design Canada's research computer network, similar to the Internet, but much earlier.[20] The network called CANUNET design was worked out, but never implemented.

[20]The Internet protocol was created in the mid 70s by my friend and co-author Vint Cerf and his colleague Robert Kahn.

Chapter 6

The 1970s

During the 1970, 1971 and half of 1972 (my term as Chair ended on June 30, 1972) I worked hard at continuing to build the department finally ending up with 35 faculty members from the original 5. About 1970, I was offered the opportunity to join the Science Council of Canada (SCC) as an advisor on information technology. This would have required moving to Ottawa during the week, travelling all over Canada and abroad, and coming home to Waterloo on the weekend. I turned down the offer as I had a growing family and department, both of whihc required my time. Instead I nominated Eric Manning who had a wonderful experience.

6.1 1970

6.1.1 Back to Brazil

In 1970 I applied to NRC for another fellowship to work in Brazil and was awarded one again. This time we took the whole family (Marg, John and Mike). We lived in an apartment in Ipanema (remember that girl) near the corner of Visconde de Piraja and Teixera de Melo. The apartment was fine, lots of space and came with a maid by the name of Ouzeira. She was fantastic even though she could not speak English and our Portuguese was limited. She put great meals on the table.

Marg and the boys went to Ipanema beach almost every day, while I labored (?) at PUC-Rio. While at PUC-Rio, Carlos Lucena and I came up with a scheme to bring faculty from Brazil to Canada to study for a PhD. Now all we had to do was find funding. Over the next year or so we approached the Canadian International Development Agency (CIDA) about our ideas but ran into several roadblocks.

This was 1970, Brazil was in the World Cup of Football in Mexico City. We watched the games in our own apartment or at other peoples' and then proceeded to drive around town flying Brazilian flags from car windows. When we went out, we made sure the shutters on the apartment were closed as Brazilians had a habit of shooting rockets from the window every time Brazil scored a goal. Of course, Brazil won and 8,000,000 people went to downtown Rio to welcome them home. My wife wisely decided we should skip this party. She was right, several people were crushed in the crowd. At the end of the 2-month stay we came directly home, no side trips for me this time.

Figure 6.1
Marg with John and Mike on Ipanenma Beach in Rio

6.1.2 Christine Anne Cowan

Late in 1969 Marg and I had applied to adopt a little girl. No sooner had we arrived back from Brazil, then we were notified about being proud parents again. Christine Anne Cowan, born on December 24, 1969 joined our growing family in July 1970, all of 6 months old. Unfortunately she missed the trip to Brazil, a fact she reminds me of to this day. Christine was baptized in November by Reverend Bill Hockin at All Saints Anglican Church in Waterloo. We finally broke with the Christmas tradition. Well our little family was complete. Her Godmother is Christine DesRocher, Marg's cousin.

6.2 1971

6.2.1 A Trip to IFIP - Ljubljana

In 1971, the International Federation of Information Processing (IFIP) held its triennial conference in Ljublijana Yugoslavia.[1] I flew over to attend the conference, stopping in England to visit with Connie and Roger Green, where Roger was on sabbatical. The conference was uneventful except for a lot of rain, which caused some logistics problems such as power failures. We had an opportunity to gather together with many of the Canadians.

[1] Ljubljana is now the capital of Slovenia in the dismembered Yugoslavia.

Figure 6.2
Mike, Chris and John posing for 1970 Family Christmas Card

6.2.2 Trips to Brazil and Venezuela

During the early 70s I received invitations from IBM Latin America to speak in both Brazil and Venezuela. The Brazil trip was independent of my other Brazilian connections. I met my old friend and colleague Ted Grayson in Rio at the Gloria Hotel. From there I gave talks around central Brazil, although I don't remember where.

Shortly after that, I flew to Caracas, Venezuela and met with Ted Grayson again, and then gave several talks in the Caracas area and Eastern Venezuela.

6.3 1972

6.3.1 Stanford and Xerox - My First Sabbatical

As June 30, 1972 approached, I prepared for my first sabbatical. I had visited George Forsythe the Chair of Computer Science at Stanford and arranged to spend a year there; unfortunately George died later that year before I arrived. I was at full salary owing to accumulated administrative leave and did not have to pay taxes as I was non-resident. The Government of Canada soon closed that loophole.

Jim Mitchell, one of the original WATFOR team was visiting UW from California where he was working at the XEROX Palo Alto Research Centre (XEROX-PARC) and suggested I might spend time with them as well, since it was just up the street from Stanford. They even threw in a small fellowship ($5,000).

We were contacted by a real estate agent who found us a house on the Stanford campus at 801 Cedro Way. We rented our Waterloo house to the Izumi family, who were visiting Waterloo, for about half of what we were paying in California; bought a 1972 Ford station wagon for export and were on our way on July 2. We decided to camp while driving across the US so we bought Ken Fryer's little camping trailer.

Figure 6.3
On the road to California - Chris, John and Mike in South Dakota

It was a great trip across Ohio, Michigan to South Dakota to Yellowstone to Nevada to California. We saw many great sights including a close encounter with a bear in Yellowstone.

We arrived in Stanford to our house which was a lovely building and property with a lemon tree in the backyard, although the construction of the house left something to be desired. No insulation to protect you from heat or cold. Summers were warm but not overwhelming except for two weeks in September; winter that year was wet and somewhat cold with snow landing and sticking six blocks from home. Once we arrived, we enrolled John (Grade 2) and Mike (Kindergarten) in Lucille Nixon School across Stanford Avenue, a moderately busy street with a traffic light close by. It was very convenient from another perspective, as we could watch the boys coming and going to school from the kitchen window. One of the favorite occupations was watching Gilligan's Island after school, although TV time was limited.

Shortly after arriving, I took up running, as Stanford did not have any squash courts, my favorite exercise. I started with a mile and worked my way up to two miles before returning to Canada. I also lost 18 pounds, down to 157. I kept running until 1990 when my back told me it was time to quit. At that time I was running 5 miles per day and was close to 150 pounds.

Marg also connected with Dorothy Collins as her husband George was also on sabbatical in Computer Science. George was one of the early researchers in symbolic mathematics and computer algebra. Dorothy was a great friend and mentor to Marg as well as providing her with great insights into American politics. We visited with the Collins in Madison in 1974 where George was at another UW (University of Wisconsin) and I gave a talk about my research and generalization of Moore graphs. Ed Moore the inventor of Moore graphs was in the audience and treated me well.

It was a fantastic year with lots of travel within California. Trips as far south as San Diego, into the Anza Borrego desert, visits to Los Angeles where we saw Disneyland and visited with Carlos

and Marisa Lucena and their family. Carlos was taking his PhD at UCLA. Of course we visited the Napa and Sonoma valleys for wine tasting and made lots of trips into San Francisco.

Early on I received a call from Mike Jenkins at Queen's University in Kingston Ontario asking if I would be interested in the position of Chair of Computer Science. I decided to consider the possibility and so flew up and spent several days being interviewed and interviewing people such as Ron Watt, the Dean of Arts and John Coleman, the formidable head of Mathematics. I was offered the job with a promotion to Full Professor. I did not accept immediately but returned to California. I called Ralph in Winnipeg and asked his advice. His comment was simple "Donald don't be an idiot." This piece of advice I value to this day. Ralph had a much clearer vision of the future of UW than me.

One group of visitors came in the Fall. This was the Vellinga family (John, Marg, Cathy and John Andrew), our neighbours in Waterloo. John Vellinga was an Assistant Professor of Computer Science and an Air Canada pilot,[2] and so his family travelled a lot. We chatted and then thought we should all go to Hawaii for Christmas. We found two rentals in the Stanford paper and contacted the owner, a Stanford professor. The Cowan family rented one and the Vellingas were supposed to rent the other, but it didn't happen for family reasons.

However, Christmas was still a wonderful magical time as we arranged to rent the place on Maui (yep Hawaii) just outside Lahaina for 3 weeks. This was Christine's first airplane flight. Except for Christmas Day when John was sick, it was unbelievable. Our Christmas tree was a Norfolk pine, a type grown in Hawaii; real Christmas trees were too expensive. We decorated it with popcorn strings and other old-fashioned decorations. We celebrated New Years as well, and I dressed up as Happy New Year in a diaper. One of the people at the party took a picture and offered to send it to me. I gave him my business card and the picture went to UW, where my new secretary, who I had not met, opened the envelope and then asked other department secretaries who was in the picture. The response was "That's your boss." The picture did the rounds of Computer Science at UW and everyone had a chuckle at my expense.

The professional part was equally exciting. I worked in Ed McCluskey's lab at Stanford and that is where I met Vint Cerf, who with Bob Kahn created the Internet in 1974. Vint was starting as an Assistant Professor having just received his PhD from UCLA under Len Kleinrock. Vint and I started working on network problems related to reliability where we also engaged Ralph Stanton in Winnipeg and eventually produced about a dozen papers.

The work at XEROX-PARC where I spent about half my time was equally challenging. This lab had probably hired the best collection of computer people going. One example was Chuck Geschke who invented postscript and shortly thereafter founded a company called Adobe. There were many other examples such as Butler Lampson, Peter Deutsch, Alan Kay (the inventor of Smalltalk) and Bob Metcalfe (one of the inventors of the Ethernet), to name a few. It was an incredibly stimulating environment. At Xerox-PARC they created the first personal computer with a graphical user interface like Windows called the Alto (https://en.wikipedia.org/wiki/Xerox_Alto). This was the beginning of Silicon Valley, many of the talented individuals at XEROX-PARC went on to found companies.

XEROX-PARC supplied me with a terminal so I could connect from home. I even used the first laser printer to produce our Christmas letter. Part of the group had reverse engineered the early Bose speaker box and had discovered the source of the speakers. I built a pair in the living room of

[2]We always claimed that John put the plane on autopilot, so he could mark assignments while flying across the Atlantic.

Figure 6.4
Don and Marg at New Years Eve Party on Maui

Don Knuth's house with the graduate student who was renting the house at the time, and shipped them back to Waterloo.

During March I had to return to Canada to attend an NRC grant committee meetings in Ottawa. We had just received a call from Marg's brother Cliff telling us her Mother was quite ill. Marg's Mother suffered from what the medical profession called pernicious anemia, but to this day we have no idea what her illness was. We bundled everyone up and flew home. Marg went to her parents and I flew to Ottawa. We spent some time there with kids being looked after by relatives. After a short period, when Marg's Mother seemed to recover, we returned to California.

Once the sabbatical in July 1973 was over we journeyed back to Waterloo via the west coast. We turned right at Vancouver and then on to Edmonton where we met up with Sky and Tony Capri. Tony was now a faculty member in Physics at the University of Alberta having completed his PhD at Princeton a few years earlier. Then on to Winnipeg where we camped and visited many friends at the University of Manitoba including Ralph Stanton. Now across Ontario to Atikokan where we visited with John and Marg Maw. Marg Maw was a classmate of Margaret at Toronto Western Hospital. On to Bala where we dropped in on the Graham family at their cottage. Then finally home to Waterloo where the living room was strewn with all the goods we shipped back from California including two adult bicycles and our first colour TV set.

The rest of the year looked to be uneventful, back to teaching and research. However, Marg and I and the kids were attending the Santa Claus parade in Toronto and staying at the Sutton Place Hotel. We received a call from Marg's Father telling us Marg's Mother had just died. Unbeknownst to us, Marg's Mother had been in the hospital for several days. We then had to scramble as there was funeral to arrange and children to manage.

Before leaving California, I heard from Carlos Lucena that he had figured out how to get CIDA to fund graduate students from Brazil to study in Canada. The process was to involve several Brazilian universities and at least two Canadian Universities. In Brazil, we contacted the Federal

Universities of Bahia, Pernambuco and Paraiba at Campina Grande. In Canada we joined forces with Kelly Gotlieb at the University of Toronto. We put in a proposal that was funded in 1973 and allowed us to send people from UW (Tom Maibaum, Frank Tompa, Paul Dirksen...) and UT (Lori Johnson ...) to Brazil and bring people from Brazil to Canada (Arndt von Staa, Luis Furtado, Paulo Cunha ...) The program lasted until 1981, but the tradition of students from Brazil coming to UW for graduate work has continued to this day. In fact several of my students and postdoctoral fellows were and are Brazilian.

6.4 1974

6.4.1 The Waterloo Foundation for the Advancement of Computing - WATFAC

Under Wes Graham's leadership UW had a significant reputation in developing software to support teaching. In 1974 Wes was approached by Digital Equipment Corporation (DEC - http://en.wikipedia.org/wiki/Digital_Equipment_Corporation) to build WATFOR and WATBOL for the DEC PDP 11/45 computer. The software was to be called WATFOR-11 and WATBOL-11. DEC would give Wes the computer, but would not give it to the UW. The simple reason was that if they gave UW a computer, following Canadian tradition, they would have to give one to all the other Canadian Universities, about 50 at that time.

Wes called Paul Dirksen and me together to discuss how we would pull this off. We first formed a non-profit entity called The Waterloo Foundation for the Advancement of Computing (WATFAC) to own the computer and any resulting software. Graham, Dirksen and Cowan were the Board. WATFAC became a charity about a year after being incorporated, an action we regretted later because of the complexity of dealing with the Canadian Government.

Although we were being given the computer we still had to pay monthly maintenance, hire programmers to write the software and rent space to house the computer and the programmers. Somehow we came up with the idea of offering seminars on structured programming, a new and hot topic at that time. We created some brochures and mailed them to various companies. We were overwhelmed by the response and offered several seminars in Toronto, Montreal, Ottawa and Winnipeg. None of us took any salary for these seminars, but did pay expenses. After one year we had raised over $200,000. We rented space on the second floor of the building at the corner of University and Phillip Streets[3] in Waterloo; the first floor was a Bank of Montreal branch. Of coure we called it the Bank. We gradually took over other offices in the building until WATFAC bought the building, which we called the "Bank" in 1979.

We distributed the software and also wrote books supporting it. We charged for this software as we did for the earlier IBM versions of WATFOR and WATBOL. Eventually WATFAC had accumulated income, whicj supported investments of about $5,000,000. The income generated from this investment was used to give teaching and research fellowships to bright high school students and teachers and to fund computer science research.

WATFAC existed from 1974 until 2002, three years after Wes Graham died. At that time we decided to close it down. WATFAC still had several hundred thousand dollars from software and the sale of the Bank, which were given to UW to be part of the Wes Graham Information Technology Trust, which will be described later.

[3]Paul Dirksen's Father owned the building.

6.4.2 WIDJET

The Waterloo Interactive Debugging Job Entry Terminal System (WIDJET), a name coined by Jim Dodd[4] was created to allow students to use terminals (video screens with connected keyboards) to enter and run their programs. It was first created for a Digital Equipment Corporation PDP11/45. The programs were typed and then submitted to the batch job stream. But because the batch was so fast, the interaction looked like timesharing (http://en.wikipedia.org/wiki/Time-sharing), a technology that has long since disappeared with the coming of the personal computer. WIDJET was very popular, although when too many students were using it, performance suffered, resulting in complaints and a t-shirt with "WIDJET SUCKS" written across the front.

We eventually moved WIDJET to the IBM Series 1 computers about 1976-77. Jack Solomon, an IBM salesman became enamored of WIDJET and decided he could sell it to the educational community along with the Series 1 computers. I became the salesman for WIDJET traveling to an IBM installation in Atlanta once a month to give classes on WIDJET to IBM salesmen. I also traveled to other locations, but Atlanta was the primary spot.

My final talk on WIDJET in 1978 was in Princeton New Jersey just before I went on sabbatical to Switzerland. Terry Wilkinson accompanied me as he took over the speaking task.

6.4.3 WATDON Systems

I established WATDON (WATerloo DON) Systems Limited on March 11, 1974. The objective of the company was to do computer consulting, own any books I wrote and make investments. WATDON existed until 2011 when it merged with JOMICA Investments Incorporated - more about this later.

6.4.4 Camp Tawingo

While in California we heard from Dorothy Dunkley about cross-country skiing and Camp Tawingo. Camp Tawingo was owned and operated by our next-door neighbours in Waterloo, Jack Pearse and his wife Helen.

Dorothy organized Winter Weekends at Camp Tawingo where we would participate in outdoor sports, particulary cross-country skiing.[5] She brought a lot of people together through these weekends and many became our friends. We participated in these weekends for many years and learned how to cross-country ski. Our children became very good, good enough to participate in the Ontario high-school cross-country ski championships every year they were in high school.

The children started going to Camp Tawingo for summer camp as well. John and Mike started in the summer of 1974 and Christine in 1979. Marg worked at Camp Tawingo as a nurse for a few weeks in the summer of 1978 and 1979 which provided us with lower camp fees, namely free for all three children.

John, Mike and Christine participated in the two-week canoe trip in their final year as campers and then went on to Tawingo Leadership Course (TLC), where you learn to be a camp counselor. John and Chris became camp counselors while Mike chose a different route by enrolling in the Ontario Junior Ranger program operated by the Ontario Ministry of Natural Resources. He then spent the two summers in the Nipigon area of Northern Ontario.

[4] Jim was an Associate Director of the Computing Centre at the time.

[5] The group from Waterloo consisting of the Cowans, Dunkleys, Pullins and Scoins families formed ourselves into a group, we called WATSKI. The name has stuck to the present, although none of us are skiing as of 2020.

Figure 6.5
John's Grade 6 class at Camp Tawingo

John and Chris spent many summers until they graduated, as camp counselors at Tawingo and then John worked at Tawingo full-time until he was admitted to the Faculty of Education at UT.

One highlight of our relationship with Tawingo was taking John's Grade 6 class for a three-day visit in 1978. It was great fun teaching many of his classmates the rudiments of cross-country skiing.

6.4.5 A Week in Bermuda - 1974

It was pretty obvious Marg needed a break, and so I planned a one-week trip to Bermuda in May 1974. It was a great trip except for one small problem. I managed to put my back out a few hours before we left. This made for an uncomfortable trip, but it was still memorable. We toured a large part of the island and met a lot of very friendly people.

6.4.6 A Little Side-trip to Italy - 1974

Bruno Forte had moved to UW by now, but was still very engaged with improving the teaching of Computer Science in Italy. He suggested sending some people from the University of Calabria (on the mainland just across from Sicily) to UW for training on how UW managed its computing centre and taught Computer Science. In this endeavour he had the full support of his colleague, Luciano d'Andrea of IBM Italy as well as the company. I joined Bruno in Pisa, Italy in June and we journeyed to Calabria where we interviewed candidates. We selected three and they came to UW in the Fall.

After the interviews Luciano picked us up and drove us to Milan via the Adriatic coast. We stopped in various locations such as Bari[6] and I gave talks at local universities.

[6]We visited the seafront in Bari with some local IBMers where I was introduced to and tried raw sea urchins.

Although bringing these Italians to UW seemed like a good idea, it did not work out. I think they learned their interpersonal skills from Machiavelli, as there seemed to be constant tension among the members of the group.

6.4.7 A Trip to Austria - 1974

During the summer of 1974 I was contacted by the Canadian Government to accompany a government scientist in October to assess Canada's investment in the International Institute of Applied System Analysis (IIASA - http://www.iiasa.ac.at/) in Laxenburg just outside Vienna. Tough life.

Marg and I flew over and had a couple of days in Vienna followed by a few days at IIASA. Our first night in Vienna was at the Vienna State Opera, what an experience. We saw Verdi's Força do Destino, where it took the fat lady quite a while to die. However, the spectacle was incredible as the locals followed the score using tiny flashlights.

One humorous incident occurred during the visit. Being an international institute there were many nationalities including Russians. The Russians were in charge of the computing centre for IIASA, which contained an American computer, a DEC PDP 11/45. Imagine our surprise when we went to the computing centre and there was the computer in pieces all over the floor. The Russians were figuring out how it was put together (reverse engineering), and communicating the information back to the USSR.

I finished my job and then we drove from Vienna to Munich stopping along the way in Salzburg, at a mountain inn. We reached Berchtesgarten and decided to drive up. As we approached the road the guard yelled at us as we went by "die Ketten, die Ketten." Being slow on the uptake I did not realize he was telling me to put chains on until we drove into a blizzard with about a foot of snow on the road. We survived but it was a challenge.

6.5 1975 - 1977

1975 was a fairly normal year with the exception that I was promoted to Full Professor. This was eight years after being promoted to Associate Professor and ten years after finishing my PhD. I continued with my research and teaching for the next couple of years and our family was growing up. By 1976 John was in Grade 5, Mike in Grade 4, and Christine in Grade 2 all at Centennial School just across the park from our house. The two boys went to Centennial for their entire elementary school career, but Keatsway had been built as a junior school at the time Christine was entering Grade 3, so she spent one year there.

In 1977 I started to think about another sabbatical and looked into working at an IBM Research Lab. We wanted to go to England as Marg would be on semi-familiar ground. However, fate intervened and I was offered a position at the IBM Research lab in Rüschlikon just outside Zurich Switzerland. They wanted me to come for an interview before confirming the position of visiting scientist.

Fate intervened again in that my friend Hector Leiserson of IBM Europe invited me to come and lecture at La Hulpe, an IBM education facility located in the town of La Hulpe in Belgium. After lecturing, I flew to Zurich and met with Armin Frei, the Director of the Lab, and Harry Rudin, a senior scientist. They introduced me to other researchers and "interviewed" me. At the end I was offered a position and they would supplement my salary by $20,000 US. Sounded great.

Figure 6.6
Don and Marg in their "Swiss" costumes

Now where do we live? Fortunately one of the scientists, Eric Port, was seconded to the US and so his apartment in a 3-unit building became available at Langhaldenstrasse 11, a 10-minute walk from the lab. What a location, the apartment building was on the side of a hill and the dining room and family room overlooked the Zurich See (Zurich Lake). The landlady, Frau Luchsinger lived in the building and was a wonderful woman who spoke fluent German, English, French and Romansh[7] and switched between them without thought, which sometimes made it difficult to follow her.

I came home and told the family we were going to Switzerland and that we had an apartment. You can imagine the surprise and wonder. I wonder what it will be like living and going to school in Switzerland. What is this apartment like?

Before going to Switzerland I turned forty and our friends had a great party for both Marg and me. They even bought some clothes which were supposedly Swiss, but looked more Mennonite.

Shortly after my birthday we spent March Break in the Quebec Eastern Townships. Along with the Dunkley family we rented a farmhouse on Lake Mephremagog where we spent most of the week cross-country skiing and where we were first exposed to downhill skiing at Owls Nest near the Vermont border. I can always remember Marg accidentally skiing across the hill after getting off the chair, Christine (age 8) bumping Ron Dunkley off the chair and riding up on her own and of course Mike "accidentally" going to the top of the mountain and skiing down; he said it was "scary."

[7]Romansh (https://en.wikipedia.org/wiki/Romansh_language), German, French and Italian are the four official languages of Switzerland.

6.6 My First Encounter with Personal Computers

I was interested in this new phenomenon of microcomputers and what it really meant. At this point, they were still primarily a hobbyist's toy. I bought a Heathkit microcomputer kit and assembled it, then tried to program it through a keypad. Unfortunately, this was extremely primitive and not user friendly. Since, I was about to depart on sabbatical, I passed on the microcomputer to Jerry Krist, who built the hardware for our research group. Jerry incorporated the computer into the illuminated computerized scoreboard for the world water ski tournament that took place on Centre Island in Toronto in August, 1979. Of course, the tournament technical director was Wes Graham, and it was the first time computer scoring had been used in water ski championships.

6.7 My Second Sabbatical - IBM Rüschlikon Switzerland

Well here we go again, another sabbatical, rent the house, change schools, change cultures. Change, change, change. Can we handle it?

With fear and trepidation we rented our house and Casey the calico cat (I forgot to mention we acquired a cat a few years earlier) to a group of girl students who were on opposite cooperative work terms.[8] Were we crazy? We took a chance. They were incredible tenants taking care of the house and garden better than we do. They also spoiled the cat. No worries there.

John, Mike and Christine were 12, 10 and 8 and about to turn a year older. We enrolled John in the American school in Horgen about two towns away, which meant he had to take the train to school every day. Mike and Chris were enrolled in the Moosschule (swamp school as it was built on what was once swampy ground), the local school where the language of instruction was Hoch Deutsch (proper German) and the language of the school yard was Schwyzerdütsch (Swiss German). They became quite fluent in both, although they struggled at the beginning.

Off we went to Switzerland via London. We spent a few days in London seeing all the sights and then we took the high-speed ferry across the English Channel to Calais (remember the train under the channel, the so-called chunnel, was still a dream). In Calais we picked up our Renault 12 station wagon, which I had arranged to lease for a year with an option to buy. We drove across France stopping in the district of Champagne the first night and in Basel the next night. At this point Marg noticed the prices and wondered how we were going to survive. She retreated to the bathroom and broke into tears.

As we entered Switzerland, we were waved through immigration with a cursory look at our passports. A few days later I received a notice that I had not presented my chest X-ray for tuberculosis. I had to go to the Zurich Airport, have a chest X-ray and pay a fine of 50 francs. What a welcome.

From Basel we drove straight to our apartment in a triplex at 11 Langhaldenstrasse in Rüschlikon where we stayed for the year. Our landlady was Frau Luchsinger. She had traveled most of the world and spoke several languages including English and German fluently. Conversations were often confusing as she would switch between English and German without missing a beat but with us missing several, although we usually caught up.

No sooner had I arrived at IBM, then I was informed that the school authorities were after me as my children were not in school. School starts earlier in Switzerland than Canada but they have more breaks. If Mike and Chris did not show up immediately I would be fined 50 francs. We enrolled

[8] Remember that UW was based on the concept of cooperative education, where students alternated between terms of study and work. UW now offers the largest cooperative education program in the world.

Figure 6.7
Our house in Switzerland and a view from the dining room

them the next day in the Moosschule about 3 blocks from our apartment. Apart from this rocky start the year was fantastic. School was 5 1/2 days a week for Mike and Chris with a half day on Saturday. John did not have to go on Saturday.

We first found the grocery store called Migros. There was a small one in Rüschlikon and a large one in Thalwil, the next town. This store was like Canadian Tire with groceries in that you could buy sporting goods and other gear. Although the prices were high we learned to eat more like the Swiss and tried a lot of new things.

Work was exciting in that I continued my research in computer networks. Remember the internet had only been invented about 1974 and was not popular until the 1990s. I worked with and met some fabulous people and their wives including: Harry and Karen Rudin, Ernst and Ernie Rothasuer, Pitro and Penny Zafiropoulo, and Chris and Turid Jenny. I started working with Pitro on analyzing and synthesizing network protocols. I wrote the programs that supported much more in-depth analysis. Chris Jenny and I tried to patent some networking technology but the IBM lawyers declined.

Weekends were great; we went hiking in the mountains almost every Saturday and Sunday until winter came. Then it was cross-country skiing on Saturday and downhill on Sunday. We saw a lot of Switzerland that way. The Swiss have a wonderful two-week ski vacation in February, so off we went. One week in Vigo de Fassa near Bolzano in Italy with the Jenny family, followed by a second week at Zuoz near St. Moritz. We were still skiing in April at Hoch-Ybrig about 45 minutes from home when the kids rebelled and said they wanted to go swimming at the local pool.

In October 1978, I received a call from my friend Luciano d'Andrea of IBM Italy. He asked me if I would like to speak at an IBM Italy conference being held in Florence in October. Of course I said yes. We arranged "baby" sitters for the kids and off we headed to Milan. Luciano and his wife met us there and drove our car to Florence (I was advised by Luciano when I arrived that I had set a new speed record from Zurich to Milan airport; this from an Italian from Monza). I participated in the conference, while Marg was squired around Florence by Luciano's wife. We both had a great time and then Marg gave me a "Cooks" tour of Florence.

We spent Christmas in Kandersteg, not too far from Lucern, where we did our first skiing. We started cross country skiing on Christmas Day and discovered that Marg had two left boots. She

Figure 6.8
Marg on a weekend hike in the Swiss Alps

had bought cross-country ski boots in Waterloo before leaving Canada, and they had packed two for the same foot.[9] Fortunately, the local ski store in Kandersteg was open and we were able to buy her a new pair of boots.

There wasn't too much snow for cross-country so we focused on downhill. Our ski instructor was Otto, an older gentleman who owned a hotel in the Alps between Kandersteg and Leukerbad. We visited his hotel in June, when we hiked across the pass.

During March I received a call from Budapest asking if I would visit and speak. We chose the two-week Easter holiday and traveled from Rüshclikon to Budapest with stops in Salzburg and Vienna, where the kids found their first European MacDonalds. On to Budapest, which was still under Communist rule and looked it. I went on to being "important" while Marg took the kids around town. Thank goodness taxis were cheap. We also found out how the Communist system worked. Every time Marg went to buy tickets for a tour or the Moscow Circus, it had either just happened or the tickets would be available tomorrow. Being naive we did not wake up to bribery.

Once I finished my time in Budapest we got out of the country as quickly as we could, and headed for then Yugoslavia and Plitvice park (now in Croatia); an incredibly beautiful place. We spent one or two days there over Easter Weekend and then headed to the coast and to Venice. Little did we know we just missed an earthquake by about 50 kilometers. We meandered up the coast learning how to survive in a pseudo-communist country. The people were very kind, but the rules made living awkward.

We arrived in Venice and stayed at La Fenice hotel right across from the La Fenice opera house.

[9]Marg returned to the store upon our return to Waterloo in August 1979 and they still had the pair with two right boots. They did a swap as they had been wondering where the other pair were.

Figure 6.9
John, Mike and Chris skiing at Kandersteg - Christmas 1978

I had arranged with my friend Luciano d'Andrea of IBM Italy to sing for my accommodation by giving a talk in Padua just up the road. The whole family had a wonderful tour of Venice and were treated quite royally. La Fenice has had minor guests besides the Cowans, such as one of the Popes and Queen Elizabeth II.

From Venice we drove straight home to Rüschlikon, where we returned to our normal existence. Marg's Father came over for a second visit and we spent Pfingsten (Pentecost) in Zermatt where we saw all the wonderful sights. On the way home we had a fender bender on the Autobahn and ended up calling Chris Jenny to come and drive us home. Our car ended up being repaired in France while we drove a rental Volkswagen bug.

Earlier in the year about April I had received a call from South Africa from Pieter Kritzinger, a former PhD student of Wes Graham's. He wondered if I would like to come to South Africa in July and participate in a Computer Science Education conference at Gordon's Bay near Capetown. Of course I said yes, and had a wonderful week visiting Johanesburg, Stellenbosch, Capetown and of course Gordon's Bay. Marg stayed home with the kids as our year in Switzerland was coming to a close.

The conference was great with whites and blacks mingling freely. However this was only academics; remember South Africa was deeply divided and apartheid was at its height. At the time I wondered how they would ever unwind the terrible problem; thank God for Nelson Mandela. The flight down was interesting in that I traveled on South African Airways from Madrid. The plane could not overfly any country in Africa, so we had to fly over the Atlantic once we left Spain and land on a remote island to refuel. On the way home I took SwissAir and solved that problem.

This conference was in July and so as soon as I returned to Rüschlikon we started to pack up for the return to Waterloo. We left Rüschlikon in August with tears streaming down the children's faces

as Frau Luchsinger presented each one of them with a large Toblerone chocolate bar as a goodbye present.

The return trip was fantastic, a few days in Paris then some time in Normandy where our last night in France was at the Auberge de Vieux Puits where we had a great time. This was followed by a Hovercraft trip across the channel and train to London where we spent a few more days. We started by chartering a canal boat (really a cruiser) from Richmond that we would use to go as far up the Thames as possible; Oxford being the goal.

It was a great week; we learned how to lock ourselves through taught by an older "Yachtie" complete with blazer. We tried lots of different food; buying local and often cooking on board. Of course we met interesting people. One couple we met at Henley invited us to go to the pub, while leaving our "mature" children for an hour. Of course Mike decided to "fall" into the Thames. He confessed later he just wanted to find out what it was like to swim in the Thames.

Once the cruise was finished we went into London for a couple of days. Everyone had a great time. Marg and I tried to get tickets to the Last Night at the Proms. "No way." Little did we know that Dennis and Doreen[10] Ritchie were in the line with a group from Derby with two spare tickets. We learned this later when they visited us in September. Of course as part of our trip in both directions we had promised ourselves to refrain from visiting relatives and subjecting our children to visits to people they did not know, when there so many exciting things to see and do.

Back home in Waterloo, we settled in to 276 Shakespeare Drive, purchased a 1979 Oldsmobile station wagon and I returned to UW and teaching and research. No sooner had we returned than Dennis and Doreen Ritchie arrived from England for a visit to the Canadian relatives. They stayed with us in Waterloo for a few days.

6.8 Setting up the Waterloo Software Applications Centre (WATSAC)

Shortly after my return in early fall of 1979, Wes Graham and I were talking and bemoaning the fact that so many Waterloo grads were moving to the Big Smoke (Toronto) and not staying in Waterloo to start businesses.[11] We thought it would be a great idea to set up an organization under the UW that would provide the environment to encourage such activities. We called Doug Wright, then President of UW, and told him we had an idea and would be right over to explain it. Which is what happened; Doug Wright thought it was worth exploring further and so assembled a few top people (Tom Brzustowski, VP Academic and Bruce Gellatly, VP Finance) the next day. Within a day we had incorporated the Waterloo Software Applications Centre (WATSAC) as a wholly owned subsidiary of the UW with me as President.

WATSAC should have been successful but a number of factors got in the way including an influential board member who just didn't get it. Frankly we were probably too early. What we were proposing was an incubator or accelerator centre, 20 years before the idea took hold. However, the experience taught us a lot and stood us in good stead when we set up companies in the 80s and 90s.

As a parting shot to the decade, Ian McPhee and Wes Graham set up a company called Waterloo Basic Systems, since we had been successful at creating a Basic programming system distributed by

[10] Doreen is my Mother's cousin, the daughter of my Great Aunt Florrie, my Grandmother Salt's sister.We met Aunt Florrie in 1961.

[11] Today it is almost the reverse except they are often going to Kitchener as Waterloo's twin city has established a high-tech district in the downtown area.

our research group at UW. I became a minor shareholder. More about this later.

Of course as one other footnote to this very interesting decade we decided to investigate microcomputers. Apple had produced the Apple II, Commodore the PET, and Radio Shack the TRS80. We bought one Apple II, one TRS 80 and three PETS as Commodore was offering a deal, three for the price of one. We then contacted each company asking for the circuit diagrams so that we could start to experiment with both the hardware and software. Commodore was the only one that replied and provided all the details and so we embarked on a long relationship with Commodore and Jack Tramiel the founder.

Chapter 7

The 1980s

7.1 The Family

Well we were back in Canada after a wonderful year in Switzerland. Marg and I were about to celebrate our 20th wedding anniversary in 1980. Many of our adventures over the next decade are described in other sections of this decade.

That same year John was finishing Grade 8 and about to enter high school, Mike was completing Grade 7 and Chris was in Grade 5, all at Centennial School.[1]

John went on to High school in the Fall of 1980 with Mike following in 1981 and Chris in 1983. Five years of high school passed quickly; for John it was 6 as he wanted to get his marks high enough to enter the University of Waterloo. All three went to Waterloo Collegiate Institute (WCI). They all loved sports and were part of the cross-country ski team every year. Their cross-country ski team always qualified for the Ontario finals (OFSAA). John played soccer and Mike took up track and field, trying a different event each year and always ending up in the all Ontario finals. Christine also entered track and field and ended up as a long distance runner.

Both John and Mike entered UW the same year (1986). John in Recreation and Leisure Studies and Mike in Civil Engineering. John motored right through, graduating in 1990, while Mike had a checkered career trying Engineering, then Science and finally finishing a degree in Economics as a full-time student in 1996 while working full-time for the Liquor Control Board of Ontario (LCBO). Christine went to UW for her first year in 1988 and then asked to switch to Queen's University in Kingston, Ontario. She took a degree in Psychology.

Both John and Chris wanted to be teachers; John in high school and Chris in the elementary panel. Mike being the independent soul that he is, always wanted to be his own boss and an entrepreneur, at which he has become quite successful.

7.2 Going into Business

The 1980s opened with us trying to get WATSAC off the ground, but to no avail in spite of various attempts.

[1] Chris was at Centennial School in Grade 2, transferred to the newly opened Keatsway Junior School for Grade 3 and attended Grade 4 in Switzerland.

Figure 7.1
The Cowan Family in 1984 at a Cowan Family gathering

Late in 1980 three members of the University of Waterloo Computer Systems Group research staff (Ian McPhee, Jack Schueler and Fred Crigger) decided to quit and look for exciting opportunities with companies in Toronto. Rather than move, Ian McPhee and Wes Graham decided to set up a company called Waterloo Computing Systems or WATCOM for short with Ian, Jack and Fred as the first three employees. Anyone in our team, there were about 20 of us, could invest with real money on an installment plan. Your investment had to be paid over three years. We had finally got our chance at success that we had tried with WATSAC.

In 1981 based on this scheme, we collected about $365,000 to start the company (WATDON systems, my consulting company put in $50,000 over three years as I felt I could make this amount from consulting and book royalties and so the risk was low.). As soon as the company was formed, Wes Graham convinced Jack Tramiel the CEO of Commodore, to back the SuperPet[2] and WATCOM would write the software for this new computer including APL, Basic, COBOL, Fortran and Pascal and an editor. Of course, WATCOM was paid $250,000 to produce this software and so the company began. At the time we also merged Waterloo Basic Systems into WATCOM.

Over the decade WATCOM made the same software for the IBM PC as well as HOSTCOM, which allowed microcomputers to communicate with mainframes and minicomputers. This allowed the development of a contract with the Ontario Ministry of Education to provide software for all the Ontario high schools. They then moved on to building compilers for the C language originally developed at Bell Labs in the US. The C compiler and subsequent C++ compiler were the best of breed.

During the late 80s Wes Graham decided that small businesses needed help with databases and so PACE computers systems was established (Wes was called Ace in University so Professor ACE). I was an investor. He hired three whiz kids (Peter Bumbulis, Dave Yach and Dave Neudoerffer) who immediately started to build database software designed for small businesses that ran on desktop computers. I must confess to being skeptical as we were supposed to be consulting, not building software. However WATCOM bought PACE and this database system turned out to be the flagship product of WATCOM, which ultimately resulted in the company being sold in 1994; more on this later.

7.3 Research and Microcomputers

We were operating our UW research group (the Computer Systems Group) at the Bank, which WATFAC had bought in the 70s. We were there because there was no room in the Math Building.

7.3.1 Microcomputers

Of course we were experimenting with PET microcomputers. Wes and Fred Crigger changed the read-only-memory (ROM) on the PET to make it support Structured Basic, a brand new idea. The PET used a 6502 microprocessor and our group added a whole new circuit board that contained a Motorola 6809 microprocessor, which was much more powerful. This eventually became two computers, the Commodore SuperPet and the MicroWat, a box that looked like a a popup toaster and could be used to convert a dumb terminal into a personal computer. The MicroWat became a

[2]The SuperPet was a hybrid computer created by our research group. The PET computer, which operated using the MOS Technology 6502 microprocessor had an extra CPU added based on the Morotoa 6809, which was much faster. You could switch between the two by operating a switch. More on this later.

contender to become the prototype for the IBM Personal Computer (PC) that came out in August 1981, but that was not to be.

7.3.2 Networks

Shortly after the announcement of the IBM PC, Wes Graham convinced IBM to give our group, UWCSG, a large number of IBM PCs and a number of IBM Series 1 minicomputers. Our group and WATCOM built a networked system connecting PCs to Series 1s, which were then connected to a mainframe system an IBM 370, where all the systems were running the same software. This networked configuration allowed students to run their program on whichever machine had enough capacity. Many copies of this configuration were distributed around the world.

At the same time, a lab of PCs was set up in Physics. It was pretty obvious that a network was needed to provide software to the machines and for a place for the students to store their programs as they were developing them. Adrian Weerheim and Jerry Bolce built such a network, probably the first in the world for PCs. The network was called JANET (Jerry and Adrian's NETwork or Just Another NETwork). JANET evolved and became very popular around the world. A version for the Apple Macintosh called MacJANET was developed when a number of the Apple Macintoshes were purchased in 1984.

I had brought the software for protocols I had written in APL at the IBM Lab in Switzerland back to Waterloo with IBM's permission. We used that software as the basis for a PhD thesis on communication protocols by Son Vuong, now a Professor Emeritus at UBC.

7.3.3 Project ARIES

About 1983, Wes Graham convinced Malcolm Gissing, the President of Hewlewtt Packard Canada to give UW 300 HP laptops; at the time the commercial value of these machines was $5,000, so this was a gift to UW of $1,500,000. These laptops had 500KB of memory and no hard disk or diskette drives. The software stayed in memory. Once we received the computers I took over the project and sought funding for it.

The objective was to build a network to support portable computers, again a first in its field. The network, constructed before wireless technology (WiFi) and compact hard drives were available, allowed users to operate laptops in a disconnected mode; only connecting to the network to receive e-mail, software updates and to print documents. We called the research program Project ARIES (Applied Research In Educational Systems) and of course we used the ram as the symbol.

We then applied to the Ontario University Research Incentive Fund (URIF) established in 1984 for a research grant to support the program. We received the funding in two parts, the first portion was $1,160,000. Other companies, Toshiba, NEC and IBM joined the project by contributing their versions of the laptops. These all had diskette drives so we finally acquired about 500 computers. URIF also provided another $254,667 in funding because of these new industrial contributions. These computers were the loaned to entire classes so that they could use them in support of the computational and communication part of whatever they were teaching.

We even created a distance course named CS100. This course distributed the laptop computers to distance students who learned the basics of computer use and programming. This course under the name "Introduction to Computing through Applications" is still offered.

The whole system worked extremely well and operated for several years until WiFi became commonly available.

7.3.4 The Oxford English Dictionary (OED)

At about the same time as Project ARIES, the President of UW, Doug Wright received a telex from Mike Brookes[3] at Oxford University. Mike was the former Manager of Buildings and Grounds at UW and was now the Manager of the Oxford Estates and still a great friend to UW.

Mike's telex said that Oxford University Press (OUP), a department of the University of Oxford and governed by a group of 15 academics appointed by the vice-chancellor of Oxford, was considering computerizing the 22 volume Oxford English Dictionary (OED)[4] and if UW was interested Doug should get his "#%$" over to Oxford. Doug got on the next plane and talked them into considering UW as a possible partner. He returned to UW and immediately asked Wes Graham, who was then Dean of Computing and Communications, to go to Oxford and seal the deal.

We started working with OUP and I was asked to take on the project. Because I already had Project ARIES under way I declined, but offered to find someone else. I approached Frank Tompa and Gaston Gonnet, two professorial colleagues, in Computer Science at a departmental party. I thought it was a great project, but their initial response was that "they could not see any research in that project." I do not know what changed their mind, but they agreed and created the first search engine (used by Yahoo), built tagging languages (the precursor to the Extensible Markup Language (XML)) and eventually founded Open Text, now Canada's largest software company. Not bad for a project that had no research value.

7.3.5 Rita

In the mid-80s our research group was working on building tagged documents using the Standard Generalized Markup Language (SGML). SGML was a way to tell what each part of a document represented by putting in tags. For example if you wanted to show a title you would write "⟨title⟩This is a Title⟨\title⟩," where the items in angle brackets "⟨," and "⟩" are the tags. The problem is that each type of document like a book, letter, thesis or memorandum has its own set of tags and relationships among the tags, and it is painful to have to remember them.

What was needed was a software editor where you could tell it the type of document and it would guide the writer through the tags and make sure you did not make mistakes. Such a tool was created by my PhD student Riel Smit, a South African I first met on my trip to South Africa in 1979. Rita, which means "write" in Icelandic, was the basis of Riel's PhD thesis.

7.3.6 Educating Teachers

During the early 80s I became very frustrated about teaching hardware, particularly to high school teachers. Even after building the hardware component on a circuit board, the system had to be programmed, a very painful process.

I put together a workshop that connected a hardware prototyping system, developed by Rob Veitch, one of our hardware experts to a Commodore Pet computer. This setup allowed teachers to build hardware circuits and program them in Basic, a significant improvement.

[3]Mike died in 2018 at age 93 - see https://uwaterloo.ca/retirees-association/sites/ca.retirees-association/files/uploads/files/wattimes_-_spring_20192.pdf

[4]For more detail the interested reader can read "The Word Detective," John Simpson, Basic Books, 2016

7.4 Travels

The 80s were great time for travel with the family and just Marg and me.

7.4.1 Skiing

We continued downhill skiing when we returned from Switzerland. We would usually spend the Christmas holidays at Camp Tawingo and in the March Break we would go downhill skiing. The downhill was either at Killington with Dunkleys, Uzbalises and O'Briens[5] or at Mont Tremblant as a family. Killington had five interconnected mountains; Tremblant could be a bit cold.

Our most memorable ski trip did not happen. We were on our way to Tremblant on March 11, 1984 when we were involved in a whiteout on 401 near the Pickering nuclear station. Instead of coasting through the mess, a number of cars hit the brakes and slewed across the road. We were in the second wave, but could do nothing except try to slow down. The accident was large resulting in 70 vehicles in a huge accident; miraculously only one person died. This created quite a fuss in Waterloo as I appeared on the CBC National News being interviewed. We found our way to Marg's brother's place in Port Hope through some very kind people. We spent the night in Port Hope and then returned to Waterloo in a rental van.

Our car, the Oldsmobile wagon, was totaled and so we spent the following day buying a new 1984 Mercury Station Wagon from Stevens Motors. The kids and I went skiing at Collingwood on Saturday, Marg stayed home as she had had enough adventures for one vacation. No sooner had we returned home, then we discovered the roof was leaking, but the reroofing had to wait till Spring when the shingles could be replaced.

Shortly after buying the Mercury Wagon, Wayne Stevens talked us into a Mercury Lynx, which became Marg's and the kid's car. Wayne called it the puppy sale, once you take it home, you don't want to give it back.

7.4.2 1985 Trip

In 1985 Marg and I decided to celebrate our 25th wedding anniversary with the trip of a lifetime. We would rent a canal boat in the Canale du Midi in the South of France and go from the boatyard near Montpelier to Carcassonne. Once that part of the trip was over, we would rent a car and tour a bit of the South on a circuitous route back to Paris. We flew to Paris and then Montpelier and took a taxi to the boatyard.

The next day we departed with a canal boat that pulled slightly to the left, but otherwise was fine. Part way through the first day, I asked Marg to take over while I had a quick snooze. Next thing I felt a bump and the boat had crashed into the canal wall, which was composed of jagged rocks. Marg said the boat was sinking; but I didn't see how that was possible, until I went inside and discovered water on the cabin floor.

I immediately threw our clothes onto dry land and tied the boat to a small bridge so it would not sink completely. Eventually the gendarmes came and called the boat company. I remember being called at by groups that were passing by. I learned a lot about human nature that day; a lot of different nationalities took pictures but otherwise were of no help.

[5]Dunkleys - Ron, Dorothy, Susan and Michelle; Uzbalises - Vic, Nan, Jeff, David and Karen; O'Brien - Jean and son Steve

The boat company personnel finally showed up and put on a snorkeling outfit and examined the hull. There was definitely a hole. They took us back to the boatyard and assigned us a new boat the Sun King (sunking). We then set off on a wonderful trip. We did not get as far as Carcassonne but we saw many incredible sights including the place where the canal was in an aqueduct over a wide valley. We also learned to cope with French lock-keepers who are the most unhelpful people on earth.

When the canal trip was over, we spent a few days in Provence around Avignon; then we started North stopping in Perigord, Britanny and then Normandy at our favorite inn, the Auberge de Vieux Puits. From there we journeyed to Paris and home. What a memorable trip.

7.4.3 1986 - Italy and Japan

1986 was a great year for travel at someone's else expense. We were invited by Digital Equipment Corporation (DEC - see 1974) in 1986 to talk at a conference in Rome about our research at WATFAC where we were developing software for their computers. What a great trip. Marg and I flew business class to Rome and then stayed at a hotel on the edge of Rome where the conference was being held. Fortunately the hotel had a shuttle that took us to the end of the Rome subway, so it was easy to tour the City. What can you say, the Vatican, Colosseum, many old churches, excellent restaurants; mind-blowing. We also took a side trip to Pompeii. Spectacular ruins.

During the last few summers we had rented a cottage, called Reid Rock on Lake Vernon near Huntsville and on the same lake as Camp Tawingo, where all our children were campers or on staff. Reid Rock had been built by Ed Reid, a cartoonist and friend of Camp Tawingo, who was tragically killed in an accident in Guatemala. The cottage was now owned by Jerry, Ed's brother. That's where Marg and I were, when the phone rang asking if we would like to travel to Japan to speak at a conference and run a short course on IBM computers in Japan.

During 1985 and 86, Wes Graham had convinced IBM Asia/Pacific to sponsor people from UWCSG and WATFAC to offer courses on how to use IBM PCS in education. The concept was to set up a lab of PCs connected with the JANET network and running UW and WATCOM software. Teams of two or three went to South Korea, Indonesia, Malaysia, Hong Kong, Burma and Taiwan. That is how my turn came up.

Off we went to Tokyo via Hong Kong, where we spent several days and visited Al Shurgalla, our IBM contact from the early 80s. What a great trip. We first explored the mainland and many of the local islands, plus shopped till we dropped; buying jewelery, shirts and electronics. Of course these were all merchants vetted by IBMers over the years. This is the first and last time that I have ever paid customs duty when I returned home.

When I bought the shirts in Hong Kong, I discovered that the President of UW, Doug Wright, had been there the previous week. Of course this reminded us of the joke about Doug. "Why is Doug Wright like God? God is everywhere; Doug is everywhere but Waterloo." Of course Doug Wright was traveling the globe promoting UW.

From Hong Kong we traveled to Tokyo, it was a tough trip, we were bumped to First Class. We stayed at the Shinjuku Palace Hotel on a very high floor. The most disconcerting thing in the room was the notice about what to do in an earthquake.

I then spent the next few days at the conference, while Marg toured Japan. I also connected with an old colleague Carl Corcoran, who had been President of IBM Canada and was now President of IBM Japan. At the end of the conference, John Sailors, one of my IBM hosts, suggested he and his

wife and Marg and I spend the weekend in Kyoto. In the meantime one of our other IBM hosts was going to move us to Hotel ANA in Ripongi.

Off we went on the bullet train. Once we arrived we stayed at the Three Sisters Inn, a Japanese hotel or riyokan for foreigners. Getting there was interesting as the taxi driver did not understand until it was repeated the third time. John who thought he knew some Japanese, took us to a bar where he ordered beer, except a slight mispronunciation came out as building. We thoroughly enjoyed touring Kyoto and had a wonderful time; people were very helpful often going out of their way to show us where things were located.

Back to Tokyo, where we had to take the subway to find our new hotel and then back to work on Monday to teach all about using networked computers in education. Marg continued to tour Japan while I worked. Once the week was over we packed our bags and headed back to Waterloo.

7.4.4 Kuwait

In 1988, I was invited by the Kuwait Foundation for the Advancement of Sciences (KFAS) to be a judge in the competition for the Kuwait prize. This award sometimes called the Nobel Prize of the Arab world was awarded in one field to an outstanding scholar of Arab origin residing anywhere in the world. In 1988, the field was Computer Science. My old friend Eric Manning was the other judge; there was also supposed to be a judge from Britain but he did not make it. We were in Kuwait from about December 5th to 19th.

It was a fascinating trip. We were flown first class to Kuwait City and then put up in the finest hotel. We toured as well as judged and met many interesting people. One unnerving thing was the sound of the guns from the Iran/Iraq war that was going on not that far away.

At that time the Kuwaiti Arabs were quite liberal in dress and attitude compared to other Arab states, although alcohol was forbidden. As soon as they were on the plane and outside Kuwaiti air space (all of 10 minutes), the women all headed to the washroom and changed from their relatively conservative clothes into mini-skirts. Of course they were all headed to London for the holidays.

I was invited back to Kuwait to be a judge in 1993, but had to decline because of financial and management issues with our research group, which I was now managing.

7.4.5 1989 - Greece

In 1989 Marg found another great land and sea trip. A few days in Athens and environs followed by a Greek Island cruise. We enjoyed Athens and all its sights and surroundings such as Delphi. The tours were great; we had a wonderful guide and the food was okay, but we weren't taken to the greatest restaurants. I still have difficulty eating Greek food.

We toured the major Greek islands (Santorini, Rhodes, ...). On Rhodes we opted to have a fish dinner rather than return to the ship. The tours were fantastic, the ship was a converted cattle boat and the food was okay. We also stopped at Ephesus and then on to Istanbul where we stayed for a few days savoring the sights through various tours, particularly the markets where everyone tries to sell you a carpet. Then back to Waterloo and a return to reality.

Chapter 8

The 1990s

8.1 Family

John graduated from UW in 1990 and then tried to enrol in the Faculty of Education at the University of Toronto. He did not get in on the first attempt, and so worked at Camp Tawingo for a year as a staff member. He did manage to enter the Faculty of Education at UT in 1991 and graduated in 1992. He spent his practice teaching time at Huntsville High School and was able to get a job there upon graduation. He always wanted to live in Muskoka and his dream was now realized.

Shortly after arriving in Huntsville, John was linked to his future wife Shelley McLennan by John McTavish, our cousin Marion's husband and the Minister at Trinity United Church in Huntsville. John McTavish used to direct musicals and plays every year and was always on the lookout for local talent. On a visit to the dentist, he encountered Shelley, a new dental assistant. He told her he would not squirm if she would be one of the Dogpatch girls in his musical Li'l Abner. She consented and gave John McTavish her contact information. John McTavish had already decided that Shelley was the girl for our son John, and so immediately passed on the information to him.

Needless to say, John and Shelley were engaged in 1994 and married in Orangeville[1] at the United Church on July 8, 1995 where the ceremony was conducted by none other than John McTavish. The reception was held at the Hockley Valley Inn. John had already purchased a log house on Lake Waseosa northwest of Huntsville, and so they were set upon return from their honeymoon.

In early 1998, Shelley announced she was pregnant and she gave birth to Sarah Anneliese Cowan on September 28, 1998, our first grandchild. I found out while in Ottawa at a conference, when I phoned Marg and she greeted me as Grandpa.

Of course during this time, John and Shelley decided to move into Huntsville and so bought a house on Florence Street in late 1998.

After dropping out of University, Mike went to work for the LCBO in one of the local stores and found his own apartment in Waterloo. He then decided to go back to school and returned home. He took a full-time degree in Economics at UW, graduating in 1996 while also working full-time for the LCBO. He bought a town house in 1998 in Waterloo. In 1999 he joined Mapcheck, a company that a number of my colleagues had set up in 1999. He and Beverly Bennett linked up in 1999 and became serious.

[1] Shelley's parents John and Cheryl McLennan lived in Orangeville at the time.

Christine graduated from Queen's University in Kingston in 1992, and then waited two years to enrol for a BEd at Queen's. During that time, she held down three jobs, a combination of teaching and working at Federation Hall of the University of Waterloo. Even after graduating from the Faculty of Education, teaching jobs were hard to find and she worked for two years at various pseudo-teaching jobs before landing a teaching job with the Waterloo County Board of Education at Stewart Avenue Public School in Cambridge. In fact she worked for Dr. Greta Cramer a psychologist, whose husband was a graduate student in Computer Science at Waterloo. In 1999, Christine bought a townhouse in Waterloo about three blocks from Mike. The day she moved in, July 1, 1999, her husband-to-be, Christopher Murray proposed.

We became part of the sandwich generation in the 90s. Both parents lived in Toronto and were getting on. Marg's Father, Len Short was 86 in 1990 and Don's Mother was 76. We were spending a fair amount of time on the 401 highway from Waterloo to Toronto, so we decided on tackling the problem head-on. Hopefully we could convince both of them to move to Waterloo.

Marg's Father was living in the main floor of a house in Scarborough owned by a family physician, who had his office in the basement. "Dad" maintained the offices for a reasonable rent. In 1992 circumstances came to a head as the doctor announced his retirement and plans to sell the house.

We persuaded "Dad" to move to Waterloo into a two-bedroom apartment we found about six blocks from our house. From the apartment he could walk to Westmount Place Shopping Centre and do some shopping and banking. The only problem was the uphill walk back to his apartment. He stayed in the apartment till 1998, then moved to Beechwood Manor, a retirement home two blocks from his apartment.

My Mother was living in an apartment at Scarlett Road and Eglinton Avenue in Etobicoke after selling the house at 91 Branstone Road and retiring 11 years earlier from York Memorial Collegiate. She broke her wrist in 1993 and moved to New Horizons, a retirement home on Bloor Street for rehabilitation. I spent a lot of time on 401 to Toronto, but fortunately I was on sabbatical and my time was flexible. Maurice and Ann Crawford were a tremendous help with Mom while she was recovering.

We talked Mom into moving to Waterloo; that was easy as she wanted to live close to her only son and grandchildren. Mom moved to Waterloo Heights, an apartment retirement complex, in 1994 and she was only six blocks away. She spent four years there, when unfortunately she slipped in the bathroom in 1998 and severely fractured her right leg.

We recognized when she was in Grand River Hospital that Mother was slipping mentally and could not return to Waterloo Heights so went to Long-term Care in Kitchener, basically confined to a wheelchair. This is where she remained for the remainder of her life. I used to try and visit her two or three times per week, her grandchildren would often pop by. Mom, although suffering from mild dementia could still play a game of cribbage and like a true "Salt" could always maneuver her wheelchair from the back to the front of the line at mealtime. We always put her at the back of the line and tried to leave before the "carnage" happened.

8.2 Retirement

In 1996 the University of Waterloo offered an early retirement program. I think they wanted to get rid of the expensive professors. As an incentive, if you accepted the retirement, you were given 6-months salary. This was a great opportunity for me and I took it and retired on June 30, 1996 at age 58. I was very comfortable with the proceeds from the sale of my shares in WATCOM, so I was

Figure 8.1
The Salt Family in 1994 just before my Mother moved to Waterloo

able to take my pension out of the University and invest it until I turned 72.

However, I made a deal with the Dean of Mathematics, Jack Kalbfleisch, that I would continue to do research and supervise graduate students and supervise the Education Program for Software Professionals (EPSP), which I started in 1994. I know this sounds crazy but I do love what I do. I now had the flexibility to pursue my many interests without having to deal with too much bureaucracy. I also no longer had to teach; I love teaching, but to do it well takes an incredible amount of time.

I was given the title Professor Emeritus on retirement, a standard title at Waterloo. However in 1999, I was recognized with the title Distinguished Professor Emeritus in recognition of my continuing contributions to the University of Waterloo. Another way to interpret this title is that you worked hard for the University of Waterloo, but didn't get paid.

8.3 University of Waterloo Presidents

During the 90s I worked with a number of University of Waterloo Presidents on various activities most of which have been described here. The Presidents were:

- Doug Wright 1981 - 1993 - Doug and I still keep in touch. He is living in Toronto. A recent visit was a lunch date in June 2019.
- Jim Downey 1993 - 1999
- David Johnston 1999 - 2010 (the Governor General of Canada from 2010 to 2017) - When he first arrived in Waterloo, we used to get together for breakfast at my house. You always knew David was visiting, because in those days he drove a bright yellow VW bug convertible.

8.4 Loss of a Mentor

I had worked quite closely with Wes Graham since 1961, one year after I arrived at Waterloo. As you can see from this memoir, we worked together on many different projects. Wes was six years older than I, and was a real mentor. He taught me about teaching and business over the almost 40 years I worked with him.

Unfortunately he contracted cancer of the bowel about 1990. Although he fought it gamely for almost a decade, he succumbed in August 1999. I remember being with him two weeks before he died. I was helping him compose and send an e-mail handing over control of LivePage to another management team. The family honored me by asking me to give the eulogy at Wes's funeral. I reproduce it here.

8.4.1 The Graham Medal

In 1994, Wes Graham was about to retire. I tried to figure out what we could buy him as a retirement gift. I finally decided on a medal to be given to an outstanding graduate of UW, who exhibited many of the qualities of Wes Graham. This person would normally be a graduate of the Faculty of Mathematics at UW. Wes was given the first medal as a retirement present. The description of the medal and the recipients can be found at https://uwaterloo.ca/math/stay-connected-alumni-and-friends/faculty-mathematics-alumni-awards/jw-graham-medal-computing-innovation

8.4.2 Wes and the Order of Canada

I had nominated Wes to be an Officer of the Order of Canada and fortunately he received it. Because he could not travel to Ottawa for the investiture, the Lieutenant Governor of Ontario, Hilary Weston, came to his home to present it.

8.4.3 Eulogy for Wes Graham

First let me say that this is the toughest thing I have ever had to do, but I am honored that the Graham family has asked me to offer my thoughts and observations about Wes Graham.

Wes was my friend, professional colleague and mentor for almost 40 years. We collaborated on so many things and he guided my career. I owe him more than I can possibly measure.

We are here to say goodbye and to celebrate the life of a fantastic man.

How do I characterize Wes?

He was nice to everybody, always treating everyone, the same way. Everyone was Wes' friend. It is absolutely amazing the people all over the world in all walks of life, who count Wes as a friend. That became clear in the last few days as we tried to contact everyone who knew Wes over a career spanning 45 years.

Wes was a very modest guy, and always gave everybody else credit for his accomplishments. He was unassuming and not self-seeking. It was not his style to show off in any way shape or form.

Wes had a sense of humour, he always enjoyed a good laugh, often at his own expense. The laugh was infectious and loud, it made everyone within a mile happy.

Wes was a man of principle. He always lived up to his word. He once told a class he would eat a program if they could prove he was wrong. Guess what, the students made their point and Wes ate the program printed on paper.

He put the program and tomato soup in a blender, after checking with the doctor that he wouldn't die, and ate the whole mess in front of the class. Ever after, Wes would not eat tomato soup.

At the same time, Wes could be very demanding - Wes was dedicated to whatever was the task at hand. He worked hard and smart. He asked the same of everyone close to him, and they usually met the challenge.

In a recent conversation with Doug Wright, the former President of the University of Waterloo and a close colleague of Wes for 40 years, Doug mentioned that Wes was the most charismatic person ever to be associated with the University of Waterloo. What a wonderful compliment, and certainly very appropriate.

Doug mentioned that if Wes asked one of his close colleagues to leap over one of the buildings on the University of Waterloo campus he or she would. You can guarantee that Wes would be there carefully orchestrating the leap.

Of course we could all be confident that there was a mattress on the other side for a safe landing. This was characteristic of Wes, he asked a lot, but he always took care of those who participated.

What were Wes' contributions over a lifetime of energetic achievement?

Wes had many roles: educator, researcher, entrepreneur, a long-time interest in sport, particularly waterskiing, accomplished handyman, leader in his chosen profession of computer science, a tireless worker for his community, a lover of the theatre, father to 6 children and a grandfather. Wes had incredible energy.

As an educator and researcher he recognized in the late 50s and early 60s that the computer would be an essential tool for many people in their work. He then devoted a significant part of his

career to ensuring that computers were not locked away and inaccessible, but were easy for students to learn about and use.

We all know the famous systems that came from the University of Waterloo: the WATFORs, WATFIVs and all the rest, a list too long to present here. Of course his work impacted both universities and high schools around the world.

Wes recognized good ideas and encouraged their development. His contributions were the foundation on which the University of Waterloo built its current reputation in information technology.

People who were involved in these developments have gone on to great careers in the computer field. Many of them in the last few days have told me what an influence Wes was on their lives.

Wes recognized in the late 70s, that Waterloo was educating many talented students who wanted to start businesses in the exciting field of computing. He sought a solution in which the University and the students could jointly benefit.

The first opportunity presented itself in 1981/82 when three of his former students started WATCOM to develop and market educational software. WATCOM was later to become a leader in the database field and eventually part of the Sybase organization.

The approach devised by Wes for developing spinoff companies from the University of Waterloo has been applied in the intervening decade and a half to create many of the companies that now surround the University of Waterloo.

In recognition of his lifetime of achievement, Wes was made an Officer of the Order of Canada. The Lieutenant Governor recently presented the medal in a private ceremony in Waterloo.

Wes has always been interested in sports, he took a particular interest in waterskiing. He encouraged his children to compete and some of them competed at a world and international level.

Wes was not willing to just sit by and encourage others. He worked actively for the Canadian Waterski Association in various capacities including serving as President.

In my estimation his crowning achievement in sports was the computerization of the 1979 World Water Ski championships in Toronto. This was a first, and showed how computers could be used to score complex sporting events in real-time.

Results in water skiing were finally available within a few seconds instead of a few hours as in the past. Wes' approach was then adopted for all future competitions. Of course several of the people here today can tell stories about that first computerized championship - it can only be described as a Wes Graham adventure.

Wes could turn from high-tech computers to hammer and saw with ease. I think he used construction to relieve the tension from the cerebral activities associated with computers. Wes purchased a property in Muskoka many years ago and built two houses. These were not cottages, but full winterized residences.

Even here Wes was a perfectionist and chose his co-workers with care. I remember one incident where his helpers did not nail the shingles correctly; they were all removed and re-installed. Of course in typical Wes Graham fashion, the helpers never learned about this mistake, it was all done after they went home.

Wes was a long-time supporter of computing in Canada. He served as President of the Canadian Information Processing Society or CIPS for two successive terms in the 60s, and founded most of the structure of the current CIPS organization. He has continued his activity in CIPS until quite recently.

Wes was an active participant in the Kitchener/Waterloo community offering his help wherever it was needed. In recent years he devoted his energy to the local medical community, actively working for the Grand River Hospital Foundation.

Wes loved the theatre, he would often slip off to London for a few days and immerse himself in plays and musicals. He has quite a collection of programs for all the performances he saw. One of the few regrets he expressed was that he would not be able to introduce his grandchildren to the delights of theatre.

Finally, as a father to 6 children, he supported them in their activities, provided an environment where they could excel, and encouraged them to reach for the stars. His encouragement, his pride, and his guidance were a constant source of strength to his children.

They will miss this strength, miss his phone calls on birthdays and anniversaries, miss his cottage projects, miss his storytelling, and even miss his obsession for perfect grammar and his intense dislike of answering machines.

Most of all, they will miss his many idiosyncrasies: like assigning nicknames to everyone and everything (he used to call me Slick), collecting hotel soap and supplies, or buying ten of something on sale when he only needed one (chain saws, VCRs, frying pans, shoes, or watches).

What an incredible man!

Wes you have lead a life that is an example to everyone, it wasn't perfect, none of us are, but you have left many living monuments and much to emulate.

Not bad for a poor boy from Copper Cliff Ontario. God bless you.

8.5 Travel

The decade of the 90s was a great travel time both professionally and personally.

8.5.1 Ireland - 1990, 1991, 1995

We had three wonderful trips to Ireland in the 90s. We first went in 1990 to a conference at Trinity College Dublin staying a hotel in Dublin and meeting up with our old-time friend Norah Smith. Norah immediately tried to walk our legs off with walks around Dublin and out to Richmond by the sea for a fish feed.

Before the conference started, we made contact with my old friend George Baird who was Secretary of the Governing Council of Queen's University in Belfast and made an arrangement to go to Belfast for the day by train. George and I were in graduate school together at the University of Waterloo in 1960 and 1961. We had a wonderful time with George and his wife Honor, even getting a glimpse of the training for the Marching Season, and then took the train back to Dublin.

In the meantime, Dublin had gone mad. The Irish soccer team had returned from a third place finish in the 1990 World Cup in Rome, their best finish ever. The streets were crowded with a ceremony in front of the Trinity College gates. We quickly retreated to our hotel and watched the rest on television.

After the conference we rented a car and went south from Dublin, circling the coast around to Shannon, where we crossed back to Dublin. We stayed in some amazing places, stately homes, B&Bs and hotels. We could always find a pub with something going on, usually a local group inviting audience participation. Even tone-deaf Donald learned to play the spoons.

We returned to Ireland in 1991 for another conference at Trinity College. This time we stayed in the President's visitors' residence, not because we were important, but because our friends at the College forgot to make a reservation for us. After the conference, we drove to Belfast and spent time

with our friends the Bairds in Belfast. From there we did a northern loop, down to Shannon and then on to Dublin.

Our final significant visit to Ireland was to see our friends the Wilsons. John and Marian were living in Schull in Southwest Ireland after sailing through the Mediterranean, the canals and rivers of France and the North Sea. We spent a delightful week exploring that part of Ireland.

8.5.2 Sardinia - 1991

Another data base summer school and conference was scheduled for Cagliari, Sardinia in the late summer of 1991. I decided to participate and so Marg and I went one week early and stayed at a lovely resort outside Cagliari. We had a great time touring the island and then moved to the conference hotel in Cagliari. Marg roamed the town, while I attended the week-long sessions.

Marg wanted to bring some fresh figs for our travel agent and personal friend Silvana Handa. She could not find any at the market, but asked the maitre d' at the hotel if he could provide some. He arrived with a taped 2-liter ice cream container which he claimed was a carton of fresh figs. Did we trust him? Was it drugs? We got to Rome for our flight home, but we could not ditch the figs, too many sniffer dogs around. Marg finally retired to the washroom and opened the container; it was figs. Now one last problem, getting through Canadian customs. Fortunately, that went smoothly, and Silvana got her figs. Marg swore she would never do that again.

8.5.3 Spain IFIP - 1992

In 1992, a paper I wrote, was accepted for the International Federation for Information Processing in Madrid Spain. Marg and I met up with our Brazilian friends Carlos and Marisa Lucena at the conference and spent several days in attendance and touring that part of Spain. In fact we "lost" our car in Segovia, when we parked it on one side of a church and looked for the car on the other side. We found the car eventually, but had some hilarious adventures asking local pedestrians and shops for information, while trying to locate the car. In fact, we met with some other attendees from the conference and had to confess we lost our car.

Carlos and Marisa returned to Brazil and Marg and I then toured southern Spain including Grenada. We then returned to Madrid to fly home.

8.5.4 Peru 1995

Jeff and Jean Weller, colleagues from the University of Waterloo, used to lead trips to various exotic locations. Marg and I joined them on a trip to Peru in 1995. There were six of us in the group. We flew to Lima and after visiting the City went north in our little van and visited some of the archeological sites that pre-dated the Incas. I felt like I was reading National Geographic, as some of the things we saw had recently been discovered and just appeared in that august magazine.

We returned to Lima and then flew to Cuzco. Marg was so excited to get going that she charged toward the terminal building. She only charged for a few steps as breathing at 12,000 feet is quite challenging, if you have just come from sea level.

We stayed in Cuzco at a very luxurious hotel that was a former nunnery and then moved on to Machu Picchu by van. We were fortunate that Jeff had arranged for us to stay at the hotel on the site of the Inca ruins. This meant that we were able to tour the site before and after the tourists arrived. What a magnificent place.

From Machu Picchu we took the train to Cuzco and then the train across the Alto Plano at 12,000 feet to Puno, Peru on the shores of Lake Titicaca. We stayed at a local hotel and then embarked on a boat for a one-night stay on one of the islands in the Lake. I think it was Isla Amantani. We visited the floating villages on the Lake and then arrived at the island. Remember we are at 12,000 feet and the first thing we have to do is climb 500 steps. Here we are high in the Andes mountains and our guide's cell phone rings, so much for isolation.

We arrived at our accommodation, which was one room with three beds for two men and four women. Jeff in his fractured Spanish, which meant he just spoke louder in English, asked if there were other rooms. We were shown other rooms, which had plumbing (toilets, wash basins and showers) and electric lights. There was one problem there was no running water or electricity on the island, not even a generator. We were served dinner, an Incan stew and then retired. Marg could not get comfortable and thrashed around so much that the bed fell apart and so she crawled in with me.

We returned to Puno the next day by boat. From there we flew to Lima flying over the Nazca Lines in the Andes, and then after a short stay in Lima we flew home.

8.5.5 Baltic Cruise - 1995

In 1995 Marg and I took our first "luxury" cruise on Holland America. The ship held about 1600 passengers and was quite splendid. We sailed from Dover into the Baltic. We then visited Oslo, Stockholm, Helsinki, St Petersburg, Rostock and Aarhus, finally disembarking at Copenhagen. The weather was beautiful and sunny the whole time.

There were many highlights, but probably the ones that remain as most memorable, are the visit to the Hermitage in St Petersburg and the palaces in the surrounding Russian countryside. At the Hermitage we had a tour for our group before the museum opened to the public. What a magnificent art collection.

We also stopped in Rostock in what used to be East Germany and took a train to Berlin for the day. That was also fascinating as Berlin was becoming the capital of the unified Germany and was changing dramatically. Of course our stop in Aarhus featured a trip to the original LegoLand. Finally we disembarked in Copenhagen where we spent a few days enjoying the city and its wonderful sights.

8.5.6 The Coast of Norway -1997

We enjoyed our Holland America cruise so much that we decided to take another one. This time it was up the coast of Norway where we visited the odd-numbered fjords on the way North and the even-numbered ones on the way South. We started from Copenhagen to Oslo, visited Trondheim and Tromso and then crossed the Arctic Circle and went on to the North Cape, the so-called northernmost point of Europe.

Again the weather was beautiful and sunny the whole time. We were up till two or three in the morning in the land of the midnight sun. The captain told us that this was the first time he had been able to see the North Cape from the ship. It was so warm in Tromso that the Americans on the tour kept asking for the air conditioning to be turned on. They were politely informed that the buses were not air-conditioned, as it was never this hot in Tromso. In fact the guide was only too glad to be rid of us so he could go swimming.

The ship returned us to Dover in England where we disembarked.

8.5.7 Skiing - Whistler, Panorama

Early in the 90s we tried to keep up our downhill skiing with trips to Whistler in British Columbia and Panorama in Alberta. We went to Whistler twice, once with Christine and to Panorama once. All were great resorts and we thoroughly enjoyed the skiing.

8.5.8 Morocco 1998

Jeff and Jean Weller announced a trip to Morocco for April 1998, and we signed on. This time there were about 15 of us and we had a small bus as we toured the country. Our guide was a Berber woman who was incredibly knowledgeable and did not have a very high opinion of the local Arabs, particularly the men.

We started in Casablanca and visited all the major points of interest (Marakesh, Meknes, Fes and Rabat) and crossed part of the Atlas mountains. The only disappointment that we were all attacked with traveler's tummy at various points of the trip. Never eat fruit and salad in a country like Morocco.

8.5.9 Alaska 1999

Another Holland America trip took us to Alaska in 1999. We flew from Toronto to Vancouver to Anchorage. After spending a short time in Anchorage we boarded a train for Fairbanks with an overnight stay and tour in Denali National Park. On from there to Eagle Alaska, where we we picked up a boat to travel up the Yukon River to Dawson City. Unfortunately one of the engines had died and so a trip that was to take two hours took 6 hours. The crew were great, they even organized a camp show and sing-a-long encouraging everyone to participate.

We eventually reached Dawson City, stayed for a couple of days and then on to Whitehorse by bus. Then over the pass that the prospectors traveled to reach the Yukon Gold Rush. From there we had our cruise as we visited Sitka, Glacier Bay and travelled down the inside passage to Vancouver.

8.5.10 Caribbean - 1994 to 1999

About halfway through the 90s, Marg announced that she would like to go someplace warm; how about the Caribbean? We have tried quite a few islands and resorts including Antigua - Halfmoon Bay (twice in 1994) and Galley Bay, British Virgin Islands, Anguilla, Grenada, Palm Island and Turks and Caicos. As well we had a couple of unconventional cruises, a sailing ship around some of the smaller islands and a snorkeling cruise arranged through the University of Toronto Alumni Organization.

8.6 Research

8.6.1 The University of Waterloo Computer Systems Group (UWCSG)

We had formed the University of Waterloo Computer Systems Group (UWCSG) in the mid-1960s when we first developed WATFOR. I was a research associate of CSG. Of course we developed a lot of software over the years, which was provided to universities and colleges for about $500 per year and to businesses for twice that amount.

Because these software systems solved a fundamental problem for both business and education, namely they were fast and they provided clear error messages, they were extremely popular. These software systems included WATFOR, WATFIV, WATBOL, WIDJET, WATERLOO Pascal, APL, BASIC, COBOL, and FORTRAN, and the local area networks Waterloo JANET and MacJANET. Over 3000 copies of these software systems were distributed in 40 countries.

UWCSG was in the Faculty of Mathematics and this became a problem for the Dean. Everybody in the University of Waterloo was trying to take money from Mathematics because they were apparently making so much from software sales. The only solution was for CSG to become a University-wide resource and operate like a company within the University, complete with a Board of Directors. This was the right decision as income climbed to $2,000,000 per year.

Wes Graham was the initial Director of UWCSG followed by Eric Mackie, when Wes became Dean of Computing and Communications. In 1992 Wes asked me if I would take over as Director of UWCSG, a position I still hold. The one thing that Wes conveniently forgot to tell me was that UWCSG had a deficit of $600,000 and 22 employees. Wes had planned for the day when we might have to close UWCSG and so had banked $1,000,000 to provide a buffer while people found new jobs. Unbeknownst to me the University was eating into this surplus to cover the deficit.

I struggled valiantly for a year to try and stop increasing the deficit and managed to slow it down so that it was only $700,000 at the end of my first year in the job. It became obvious that drastic action had to be taken, and so we fired the whole complement of 22 people. I learned about many things I never expected, including the Ontario Labour Laws, which included paying severance to people who had worked for more than 5 years in our group.

We found everyone a job, who wanted one, either at WATCOM or within WATFAC, our Foundation. In WATFAC people worked on the text database problem that eventually became LivePage. Four people stayed with me, Doug Mulholland and Trevor Grove to maintain our infrastructure and the software we were still distributing, and Wanda Densmore and Colleen Richardson to manage the books and other administration. Within a year the books were positive and CSG had a surplus of $300,000.

Eventually the UWCSG income from distributing software slowed down to a trickle as most of it was for large mainframe computers, which were being replaced by desktop personal computers. However, CSG continues doing research and finding funds from various grants from federal and provincial granting agencies and other organizations. The funds we received and their source can be found in my Curriculum Vitae, but amount to over $22,000,000 over my career.

8.6.2 Abstract Data Views

In 1991, Carlos Lucena and I invented a formal model for a software interface that we called an Abstract Data View. This was the first time such an idea had been created in the form of a mathematical description. This idea went on to produce numerous papers that appeared in prestigious journals and conferences.

8.6.3 Mapping

in 1992 Colin Mayfield and I were discussing how mapping had become so complicated, since the invention of geographic information systems commonly called GIS. Instead of tacking a map to the wall and putting pins in it, or covering the map with a plastic sheet and drawing on the sheet, you now had to call in a GIS expert. It just seemed wrong.

With help of Trevor Grove, we invented and implemented the mapping technology that is now quite common on the Web. Of course, the Web barely existed in 1992. We then transferred this mapping system to the Web in 1995 with the help of Drew MacPherson, a coop student, when we built the first prototype of a community information system. The system contained a map of the community and a directory of all the community businesses and their coordinates on the map.

The mapping system consisted of three basic components:

Map Tile processor - This tool processes images of properly geo-referenced maps and produces a set of tiles that are connected together to create a complete map.

Map server - The map server delivers the maps produced by the Map Tile processor and supports the zoom-in and zoom-out functionality and positioning over an area of interest and display objects "placed" on the map.

Map client - The map client interface is the similar to one you see with Google maps except more powerful.

The Mapping system is part of the WIDE toolkit that we developed in the next decade.

8.6.4 Waterloo Information Network - WIN

In 1998 we started building the Waterloo Information Network (WIN) for the City of Waterloo. It consisted of a map of the city, much like you now see on Google[2] with a complete directory of businesses all delivered over the Web. A local business had the opportunity to provide advertising in addition to its regular information. This was a novel idea early in the development of the Web and it is still not fully implemented by anybody.

8.6.5 Fred McGarry

I first met Fred McGarry in 1992 , when he was sent to chat with me by Doug Wright, then President of UW. Fred and I started talking about common interests in environment and how we might use information technology to manage some of these problems. Fred informally joined our group and we have been working together ever since. We have developed a number of software systems over that time, including the Waterloo Information Network just described. Many of the other activities were undertaken in the next two decades and so will be described later. These systems were developed under the sponsorship of both the UWCSG and COMAP, an organization, which we set up in 2005 and will be described in the next chapter.

8.7 Education

8.7.1 Education Program for Software Professionals (EPSP)

At the mid-point of this decade I realized that most people developing software in major companies in sectors, such as banking and insurance, had never studied computer science. Thus, they needed a background in basic computer science and software engineering. I received $660,00 in funding from

[2]Our work on maps and business directories was ahead of Google.

the Software Human Resource Council (SHRC) to create this program. I then assembled a team of people to put together EPSP a program of six basic computer courses namely:

- Modern Programming Methods
- Mathematics
- Databases
- Operating Systems
- Distributed Systems
- Object-oriented Programming and Design

We developed EPSP and started marketing it in 1996. John Green, my friend from IBM Canada, retired and joined me at that time and he took over sales and marketing for EPSP.

Our first customer was the Bank of Montreal and we offered the program at their education centre in Scarborough. The initial development was funded by the Software Human Resource Council grant of $660,000, which we needed to match. I borrowed some money from the University to start the program, and then used the fees charged to return the loan from the University of Waterloo and match the remainder. EPSP operated for most of decade finally ceasing operation in 2004. After the "dotcom" crash companies were not spending on education.

We also converted the program to distance version. We developed a system called StudySpace which allowed us to distribute each course on a compact disc (CD). StudySpace in its current version is used to support education programs related to water management for the United Nations University, International Network.

A course in StudySpace has several components:

- a set of slides for the course,
- each slide also has notes giving the full explanation for the material on the slide, and
- a note page for each slide where the student can add material about local conditions.

8.7.2 EPSTAR

We tried to develop more professional courses in cooperation with other professors at the University of Waterloo in areas such as Photonics, Communications, Networking, Community Infrastructure, e-commerce, and Health Informatics. Most of these were not too successful but the programs on Community Infrastructure and Health Informatics operate to this day although under the sponsorship of the National Institutes of Health Informatics (NIHI - https://www.nihi.ca/) operated by Shirley Fenton.

8.7.3 Consulting Scholar for IBM

In 1990 I was approached by John Green and Bob Ross[3] to become a consulting scholar for IBM. IBM had assembled a team of people who would visit universities and colleges to describe their

[3]Bob Ross was a classmate of mine in Engineering Physics at UT. He joined IBM and became the UW's account representative in 1965 when UW bought the IBM 360 Model 75, Canada's largest computer at the time.

experiences. Since UW had such an impact on the use of computers in education and research and used to be mentioned every year in the IBM Corporation Annual Report, they wanted someone from UW, and fortunately they picked me. I travelled giving talks and once a year all the consulting scholars met in the winter in Florida to trade ideas and listen to each others' experiences. This position lasted for most of a decade until the program was discontinued.

8.8 Business

8.8.1 WATCOM

We set up WATCOM in 1981 and it created the world's best C and C++ compilers. In the early 90s it developed database systems for small computers. In 1994 we were approached by Powersoft, a company that was using the database product, to buy WATCOM. As you can imagine all the investors were ecstatic when we sold the company in early 1995 for about $100,000,000. Remember, this event occurred before the totally inflated prices being offered for companies today.

8.8.2 Inforium - LivePage

Some of my colleagues had a novel idea for storing text in regular SQL databases, a heretical thought at the time. This resulted in a software system, which was eventually called LivePage. We set up a company in 1995 and this became the product. The company was first called Inforium and then LivePage. The company was sold to Janna Systems for $20,000,000 in late 1999. Because of the insanity in the so-called "dotcom" era, the value escalated to $200,000,000 and most of the investors in LivePage did quite well by selling before the "dotcom" crash.

8.8.3 J. W. Graham Information Technology Trust

Just after Wes Graham died, and our unexpected success with LivePage, a number[4] of us (Cowan, Dirksen, McPhee, Welch and the Graham Family) agreed to donate a substantial sum of money to establish the J. W. Graham Information Technology Trust. The funds were donated to the University of Waterloo with the original donors as advisors to the Trust.

The objective was to encourage innovation in computer science and the application of information technology to health informatics. The Trust has been in operation almost 20 years and has an asset worth of $7,000,000. The Trust has supported a number of chairs in computer science, statistics and health informatics as well as multiple research projects. The Trust will operate into the foreseeable future.

8.8.4 JOMICA and the Cowan Family Trust

I set up another investment company in 1996 to hold my investments in LivePage. My children owned 3/4 of the company through the Cowan Family Trust, thus minimizing future capital gains taxes. The company was called JOMICA (JOhn, MIchael and Christine Anne) Investments.

[4] Ian McPhee claims the Trust was my idea and I believe the idea was Ian McPhee's.

8.8.5 Rae & Lipskie

We hired Rae & Lipskie in 1994 to help us manage the windfall we received from the sale of WATCOM. Marg introduced me to them as she worked with Norah Rae[5] at the Maycourt Club as a volunteer. We hired them primarily because they were effective at managing investments and did not have anything else to sell. They were not involved in any investments that they would try to sell to us. It has been a good relationship, in that we are still with them after more than 25 years.

8.8.6 Mapcheck

In 1999 we attracted what looked like $2,000,000 in investment to commercialize the Waterloo Information Network. In order to do this, we set up a company called Mapcheck (check the map). We labored for a year using the first $1,000,000 but were highly unsuccessful.

The idea was to create a directory of local businesses and events for free and then charge them for advertising on the network. Of course the network was operated over the Web. This is basically the yellow page model. Of course, we were ahead of our time. This work preceded Google and others and advertising on the Web was just becoming something to be considered.

Early in 2000, we had to wrap up the operation as the second $1,000,000 did not appear primarily owing to the dotcom crash. In other words our investors got cold feet.

8.9 The Brazil Connection

8.9.1 Brazil - 1990

Marg and I started the decade of the 90s with a six-week trip to Brazil for research collaboration. We were based in Rio and worked with my friend Carlos Lucena, who also sponsored the trip. Our children stayed home as they were all at University.

We lived at the Design Centre in Leblon, but took quite a few trips around Brazil including visits to Belo Horizonte, Iguazu Falls and Manaus on the Amazon. In Belo Horizonte we visited with Yvan Campos and Regina Cabral, who had been in Waterloo a few years before with Carlos and Marisa Lucena

However the most dramatic event happened as we landed in Brazil. The new President, Fernando Color, was trying to control inflation (it was 30,000%) and one of his acts was to close the banks on the day we arrived. Fortunately Carlos had anticipated the problem and handed me a large bag of money, which I used throughout the trip.

8.9.2 Research with Brazil

Our friends and working colleagues Carlos and Marisa Lucena, whom I had known since 1966 and 1968 respectively had been coming to Waterloo for joint research with me once every few years, usually from January 1st to about mid-March. They would bring the entire family and usually enrol the 4 children (Alex, Fernanda, Andy and Beto) in school to improve their English skills (all the kids speak English fluently). This involved finding a house for each visit; a miracle that we always seem to make happen.

[5]Norah is the wife of Ken Rae, the CEO and Chairman of Rae & Lipskie.

In 1991 they started to come every year for joint research. Carlos usually brought one or two graduate students or postdoctoral fellows with him and we collaborated on many research topics, which resulted in over 100 research publications.

During our visit to Madrid in 1992, Marisa Lucena decided she would like to do a PhD. I remember discussing the topic with her on the Madrid subway. Marisa wrote a PhD thesis at PUC-Rio which she defended in 1997. I was the external examiner and journeyed to Rio for the defence. Of course, the presentation was in Portuguese, although thank goodness the thesis was written in English. By the way she passed.

Arndt and Carla von Staa came for a year in 1994 and stayed in Wayne Oldfords' house, a Professor in Statistics.

Carlos also sent one of his PhD students, Paulo Alencar, in 1994 to Waterloo for a postdoctoral fellowship under my supervision. Paulo and his wife Isabel stayed and became Canadian citizens. Paulo continues to work with me to this day on research and in support of our various business enterprises.

8.10 Health

I ran into a few health problems with an enlarged prostate and elevated PSA. I kept being sent for biopsies to make sure I did not have cancer. After a while the radiologist got tired of seeing my smiling backside and asked what I was doing there, as no cancer was found.

Chapter 9

The 2000s

9.1 Family

9.1.1 John and Shelley

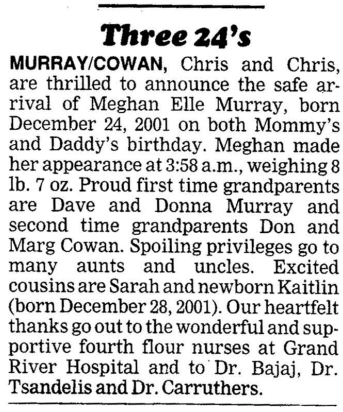
John and Shelley continued to live in Huntsville on Florence Street. In 2002 another child was on the way and Heidi Annika Cowan was born on March 20, 2003. Although they were ensconced in town, Shelley and John continued to want to live on the water. In 2004 they found a lot on Walker Lake just off Highway 60 halfway to Algonquin Park. Shelley in her inimitable way got the lot for half the asking price. They then contracted to build a house and moved in just before Christmas 2004.

Of course, as usual there is a side story. They put their house on the market in September expecting it to take some time to sell. It sold in a few days to the incoming Anglican woman priest (for those who know the program she reminded us of the "Vicar of Dibley.") for All Saints Church in Huntsville with a closing date of October 1, 2004. Where do they live? Fortunately the cottage next door to their building lot was available, so they put their possessions in storage and moved in until just before Christmas.

9.1.2 Mike and Bev

Mike announced late in 1999 that he and Beverly Bennett were going to marry in 2000. They did not want a big family wedding, and planned a tropical wedding in Hawaii. Sounded like a great idea, but it was a long way for the family to travel. We (Mike, Bev, Marg and Don) discussed the idea and agreed that Barbados was a lot closer, and just as good, especially if the wedding was at March break and the teachers in the family could attend.

The whole family, except for Sarah, flew to Barbados on Monday March 13, 2000 and stayed at the Almond Beach Resort where Mike and Bev were married on Wednesday March 15, 2000 by the local Anglican priest. Our friends and neighbours, Paul and Sandra Dirksen, who had watched Mike grow up, also came along. We had a wonderful time with the whole family together. My cousin David Cowan's wife Louise also came along. She was visiting a friend on Barbados and heard about the wedding.



Three 24's

MURRAY/COWAN, Chris and Chris, are thrilled to announce the safe arrival of Meghan Elle Murray, born December 24, 2001 on both Mommy's and Daddy's birthday. Meghan made her appearance at 3:58 a.m., weighing 8 lb. 7 oz. Proud first time grandparents are Dave and Donna Murray and second time grandparents Don and Marg Cowan. Spoiling privileges go to many aunts and uncles. Excited cousins are Sarah and newborn Kaitlin (born December 28, 2001). Our heartfelt thanks go out to the wonderful and supportive fourth flour nurses at Grand River Hospital and to Dr. Bajaj, Dr. Tsandelis and Dr. Carruthers.

Figure 9.1
Meghan's Birth Announcement

Mike and Bev returned to the town house. Early in 2001, they were expecting a child and Kaitlin Alexandra Cowan was born December 28, 2001. It wasn't long until they decided they needed a bigger house and bought their current house at 550 Buckingham Boulevard in Waterloo in 2002. But there lies another Cowan saga to be told shortly.

9.1.3 Christine and Christopher

At the same time Christine and Christopher Murray, both born on December 24th, were planning their wedding for July 22, 2000. This was more traditional and held at All Saints Anglican Church, our home parish in Waterloo. Christine had suggested a big tent in the backyard for the wedding similar to Mary Feenstra's (Salt) wedding in 1978, but that was quickly nixed. Instead the reception was held at St Jerome's University, the Roman Catholic College on the University of Waterloo campus. After a honeymoon out west, Christine and Christopher moved into Christine's town house.

Christine announced in early 2001, that she was pregnant and Meghan Elle Murray was born on December 24, 2001, Christine and Christopher's birthday. Meghan's middle name was a composite of her grandparents names Elsie Cowan and Leonard Short. They produced a cute birth announcement shown in Figure 9.1.

Shortly after the birth of Meghan, Chris and Chris decided a bigger house was in order and they started looking at the same time as Mike and Bev. Chris and Chris looked at houses at both 550 and 539 Buckingham Boulevard. They opted for 539, but told Mike and Bev about 550. In typical Cowan fashion they both bought houses at the same time almost across the street from each other.

Not long after their move, Christine became pregnant and Madelyn Elizabeth Murray was born on May 29, 2003.

9.1.4 The Granddaughters

Marg and I now had five granddaughters: Sarah, Meghan, Katie, Heidi and Maddie listed in order by age. Sarah and Heidi live in Huntsville, Ontario and Meghan, Katie and Maddie live in Waterloo, just a few minutes away from their grandparents. Sarah and Heidi transitioned to the Montessori School in Huntsville, where they both spent their elementary school years.

Meghan, Katie and Maddie attended Mary Johnston Elementary School in Waterloo, a school that provided Junior and Senior Kindergarten and grades one through six.

9.1.5 Elsie Cowan

My Mother started to slip away from us in early 2000; she went into a coma and died on February 27, 2000. Fortunately she had been able to hold her first great grandchild (Sarah) before she died. Mother was cremated and then we held a simple family funeral in Waterloo. This was followed by a larger funeral in Toronto at Runnymede United Church, where she attended for many years before moving to Waterloo. A large number of people attended. I gave the eulogy (see next section); Mary Feenstra told "Elsie" stories of which there are too many to relate here. Gayle Bruk did some readings.

Mother's ashes were also scattered at Balsam Lake. Again there is a story. We were invited to a "Salt Shaker" reunion at my cousins' John and Marion McTavish in Huntsville for the July 1st weekend. We had my Mother's ashes in the car. As we left, Marion made the comment that if Elsie were there, no doubt she would drive into the ditch. We told Marion we would be careful as Elsie was there in the back of the car. We drove to Rosedale on Balsam Lake, where we rented a boat and toured the lake scattering my Mother's ashes alongside my Father's ashes in front of the former family cottage.

Memorial Service for Elsie Cowan

Thank you for coming today to help our family celebrate the life of my Mother Elsie Cowan. Elsie's family was very important to her. For that reason this memorial service is very much a family affair.

Many family members have been of enormous help in making this service happen and I would like to thank my cousins Gayle Bruk, Mary Feenstra, Ian McTavish and John McTavish for their part in the service. A big thank you to my cousins Keith and Mary Salt and their family for all their help today in arranging many of the details with the Church. Finally, thank you to Reverend Linda Levine and Lynn Marentette of Runnymede United Church for all their support.

How do you celebrate a life of 85 plus years in a short service?

The only way I can think of it is to offer a few personal observations of my Mother and her effect on her family, and other people.

How would you describe my mother's life and her effect on others? First, through her favourite bright colours: pinks and blues, and floral patterns. That was the way she looked at life, she could always find something bright and positive to see or say.

How did she get that way? She grew up in a close loving family; she adored her two brothers and her parents. She married in 1936 and made a warm and loving home with my Father in Toronto close to other family members.

Mom matured and married during the depression in Toronto. This lead to her careful ways; she saved everything in sight, and this trait was with her all her life.

My Father died almost 40 years ago and I married and left home for the wilds of Southwestern Ontario and the new University of Waterloo. My Mother picked herself up from the crippling personal blow of my Father's death and embarked on an entirely new personal career. My Mother became a very independent woman.

She had to support herself, so she found a job at her old high school, York Memorial Collegiate. She plunged into school activities, even accompanying the school band on an overland trip to Mexico.

Runnymede United Church became an important part of her life where she re-affirmed her faith and expanded her circle of friends, befriending young and old alike. Bloor West Nursery School, Greeter at Church and Movie Nights are just a few of the activities in which she was involved.

She felt she had to be independent, so she learned to drive; in fact she bought her first car before she had her driver's licence. She passed her test in Lindsay, I think she was concerned about tackling Toronto traffic, during her test.

However, this did not stop her from plunging in, once she was official. I understand that the Runnymede Church Parking lot was one of the places where she parked by feel, rather than sight.

Having wheels would allow Mom to visit the family cottage almost every weekend and see her family in Kitchener-Waterloo without having to depend on her friends and relatives. Maybe some of you remember Elsie and her first car, her infamous Volkswagen bug.

She shared the cottage with family and friends. How many remember Balsam Lake, the swimming, the water skiing and just plain lazing around?

Of course almost every vacation she traveled. She usually found some unsuspecting person to take through a hectic pace of touring in England, Europe, Hawaii, Australia, New Zealand, and Africa. Mother was not a beach person, she had to be on the go constantly visiting new sites. She must have exhausted her many traveling companions.

Elsie adopted individuals, families and causes. Many of you were involved in these relationships. She adopted old and young alike. Many of you will remember Anne King who became the Cowan family surrogate grandma. My Mother became "Aunt Elsie" to many family members and friends and numerous stories abound of her exploits as she helped where she thought she was needed.

In recent years as her health slipped, she moved to Kitchener-Waterloo to be closer to her immediate family so that we could help with her visits to the doctor, her finances and be just plain supportive. Thank goodness she made the sacrifice of leaving her beloved clubs and friends, I am not sure we would have survived the 401.

Mom's last few years were spent at Central Park Lodge and although she was in a wheelchair, she was still the social leader, always wanting to know where the action was. She participated in everything. Mom's basic health was good until the last few days.

Thank you Mom for bringing me into this world, for providing me with the family background and values that have brought me to this point in my life and for all your support over the years. God Bless You.

9.1.6 Leonard Short

My Father-in-law started to suffer from congestive heart failure in 2002. We went to Antarctica at the time[1] but arrived back home while he was still alive. He was still awake to near the end and died on February 27, 2002, two years to the day of my Mother's death. Fortunately he had the opportunity to see three of his great grandchildren (Sarah, Meghan and Katie)

[1] He told Marg and me to go while we could.

We held a simple family funeral with all our children and Marg's brother Cliff and his family. I did the eulogy (see next section); I was getting pretty good at it. We had Dad cremated and the ashes were scattered at Parkview Cemetery in Waterloo where there is a small plaque attached to a rock memorializing both Dad and Mom, my mother-in-law who died on November 17, 1973.

Eulogy - Leonard Short

Marg and Cliff have asked me to say a few words about my father-in-law, Leonard George Short and I am quite honored to do so. We all remember Dad, Granddad or Great Granddad, as he was affectionately known to everyone in his family as a gentle, polite, self-effacing man, who would sometimes get truly annoyed when things did not go right.

Dad was very independent and in his later years had great difficulty in allowing other people to help him with his personal care. He was a man who loved nature; Dad had an almost childlike awe of the world around him.

But this gentle, caring, sometimes cantankerous man had an adventurous life. He was born in London England to Benjamin and Fanny Short and was the youngest of 3 brothers (Syd, Jack and Len).

In 1923 at the young age of 19 he entered the Royal Air Force. He trained as an aircraft fitter and spent some time in England and Northern Ireland before being posted to spend 5 years in Quetta in the India-Afghanistan border area. It was a time of great adventure.

Before leaving for India, he had met his future wife Winnifred Kent, but they did not renew acquaintances and marry until he returned to England in the early 30s. Dad and Mom had married and just nicely started a family when World War II intervened. Dad transferred to the Fleet Air Arm and spent much of the war as sea time on aircraft carriers. He had actually toured the world visiting many different ports from Madagascar to San Francisco.

At the end of the war after spending 22 years in the military he returned to civilian life in Portsmouth, where the family was settled.

But economically post-war Britain was pretty bleak, and Canada beckoned. He immigrated to Canada in 1951 leaving the family behind, and signed on first with de Haviland aircraft and then A.V. Roe as an aircraft fitter. Once he had established a base, the family followed in 1952.

He must have had a crystal ball, because he transferred to supervising the operation of apartment buildings not too long before the bottom fell out of the aircraft industry in Canada because of the cancellation of the AVRO ARROW.

Dad retired at age 65, but then continued managing and maintaining properties for Monarch construction until he finally retired for the second time at 75. Unfortunately Mom died during this period and although Dad grieved deeply, his independent nature allowed him to soldier on.

However the adventure did not stop just because he finally retired. He took several trips to Britain, Ireland and Switzerland in his later years. Of course his biggest adventure was going on a horseback trek into the Rockies when he was in his mid 80s.

Dad moved to Kitchener-Waterloo almost 10 years ago, which was a great help to family members who were trying to assist him with daily living in his later years.

He could always tell a good story with a twinkle in his eye, sometimes they were made up, but many were based on his life in the British armed forces. The brothers, particularly Jack and Len, must have got into some interesting scrapes according to Dad. How can one forget him talking about the squirrel that ate the tulip bulbs and then knocked on the front door asking for a glass of water, or the true story about his trip flying over the Taj Mahal in the 2nd seat of an RAF fighter-plane.

I have enjoyed knowing Dad or as I often called him Granddad for almost 50 years. He always had a smile, a ready quip and was very interested in where we had been or what activities we were involved in now. He encouraged us all to explore the world as he had done, with the phrase "do it while you can."

As so many of his generation Dad had trouble expressing his feelings, but he was intensely proud of his family, his grandchildren and was delighted to be a great grandfather three times over. I know we will all miss him. Before the reading of the hymn.

When Dad was in the Royal Navy there was a tradition of Church Parade, every Sunday whether on land or sea.

This hymn is a favourite of sailors and their families.

9.2 Travel

Margaret and I have been very lucky over the years in travelling very widely in various exotic and not so exotic places. There have been many great adventures. Please see the Chapter on personal travel to read some the highlights of this decade.

9.3 Research

9.3.1 The University of Waterloo Computer Systems Group (UWCSG)

UWCSG continued to expand under my leadership and we added several individuals: Kyle Young (2003), Anthony Robins (2004), Jessica Battrick (2008) and Terry Wilkinson[2] (2009). Tne UWCSG research agenda continued to evolve and move toward the application of advanced information technology in supporting societal needs. We tended to focus on problems that are often plaguing society, but are not being addressed by the computer science community. Encountering these problems was sometimes accidental in that someone outside our group would bring the problem to our attention. Most of the work focused on aggregating data about a topic in one "electronically accessible" location and then providing the tools to analyze and present that data.

Many of the problems required gathering data from multiple sources, restructuring the data and keeping this data current as the underlying data sets were often changing. This is a very difficult technical problem that requires quite a bit of ingenuity to solve. What we were doing is creating a "grocery store" for data. Just like groceries, data comes from many sources, and it is expensive to access all these sources individually. Rahther than go too each source for data, we provide the data in one location, which means accessing data costs much less.

9.3.2 Volunteering

In 2005 we were approached by Jane Hennig, the Executive Director of the local Volunteer Action Centre (https://www.volunteerwr.ca/) to help with the computerization of their volunteer process. This primarily consisted of allowing potential volunteers to find volunteer positions using the Web. Formerly, potential volunteers had to go to libraries or city halls to look up positions in big books of volunteer positions. We built the initial system and launched it in September 2005. People flocked

[2]Terry and I had worked together at various times since the 1960s, when he was an undergraduate working with me during the summer.

to its use and people looking for volunteer positions quickly climbed by 500%. This connection led to the formation of a company called VolunteerAttract in May 2015, which will be described later.

9.3.3 Environment

Connections to the Ontario Ministry of Natural Resources led to the creation of a large environmental database and associated tools. The initial purpose of the database was to capture all the environmental data that had been collected over the last fifty years about flowing waters in Ontario. This data, which is of great value because of climate change, was in danger of being lost as people retired and there was no provision to retain the data. This database is called the Flowing Waters Information System (FWIS). This system has been expanded to capture other data and to make it publicly available.

Many of the tools and concepts behind this database are ground-breaking. Keeping the data up to date is a difficult problem as the sources of data keep growing and changing over time. In addition, applications are being developed almost continuously, while the database may be changing in structure as new data types are added. This creates a huge maintenance problem. Could a method be created to make the applications independent of the database structure?

9.3.4 Land Use

Through a chance encounter with a person named Ron Adams at Cambridge City Hall in the early part of the decade, my colleague Fred McGarry learned about site selection for properties and how hard it was. The problem was the number of documents that had to be assembled in order to assess whether a property or building should be purchased for use or development. Acquiring the documents to assess a single commercial property could cost more than $20,000

It seemed possible to have the map of the property appear on the screen of your computer or even tablet, while in the field, and all documents associated with the property would appear at the same time. We built a system to illustrate that this could work and demonstrated the system. Over the years we have refined our work and recently in 2016 incorporated a company called CivicAtlas to exploit these ideas. More later.

This research was an extension of our earlier work on the Waterloo Information Network in the 90s.

9.3.5 WIDE Toolkit

Building all these information systems meant that we were repeating many operations such as databases, input forms, output reports and maps with geo-located information such as location of buildings or environmental sampling sites. Rather than code these components each time they were needed, we created a toolkit that supported the specification of these objects rather than coding them.[3] it was proposed by my friend Dominic Covvey to call the toolkit the Web Informatics Development Environment (WIDE) toolkit.

Since the WIDE Toolkit eliminated the need for a lot of standard programming, programming productivity increased quite dramatically. For that reason, our research team was able to attempt various new projects, which tested whether our productivity had really improved. We discovered it

[3]The ideas behind the toolkit originally came from a student who got tired of writing the same code over and over.

had worked and we were approached to see if we could produce more software systems and could we run them?

Running the programs at the University of Waterloo was possible, but created a problem. In the early part of the decade, UW was not a reliable place to run programs; 24X7 operation was not possible. Therefore, we had to come up with an alternative solution. This became the Centre for Community Mapping (COMAP.ca) or COMAP for short.

9.3.6 The Centre for Community Mapping (COMAP) - COMAP.ca

Fred McGarry and I set up the Centre for Community Mapping (COMAP) in 2005 as a not-for-profit research corporation. I became Chairman of the Board and Fred McGarry became Executive Director.

The objective of COMAP was to attract and provide grants for research and to operate software systems in support of research. COMAP still operates and has a close relationship with many organizations including the University of Waterloo.

Because of a conflict of interest over research grants, I severed all connections with COMAP in 2009.

9.3.7 Brazilians

Carlos and Marisa Lucena continued to visit Waterloo to do joint research every winter during the decade except for 2002. They lived in various houses. One was provided by our friend George Hill, who would go to Florida in the Winter. Eventually, he stopped going to Florida and so in the last few years we had to find another house. Fortunately, we were able to rent the home around the corner at 208 Mohawk owned by John and Charlotte Holmes, who spent the winter in New Zealand.[4]

Again, Carlos sent one of his PhD students, Toacy Oliveira in 2001 to do a postdoctoral fellowship under my supervision. Toacy returned to Brazil to a professorial position in the south of Brazil. However, he returned in 2009, bought a house and he and his wife, Angela, and his children became Canadian citizens. He now teaches at the Federal University of Rio de Janeiro (UFRJ), but spends his summer (our winter) in Waterloo. He often commutes from Rio to Waterloo for two or three weeks during the school year in Brazil. We work together on research focused on processes and workflow.

9.4 Business

9.4.1 Trike

Once Mapcheck folded because of the withdrawal of investment, two of the employees, Mike Cowan (my son) and Trevor Grove formed Trike Systems, which went into business building web sites for local businesses, governments and NGOs. They were fairly successful with some high-profile local clients.

[4]This achieved one of Marisa Lucena's dreams of living in a house in Beechwood.

9.4.2 Medmanager Interactive

After about two years of operation, Trevor and Mike with the assistance of Bill Weiler decided to move Trike into the area of chronic disease management over the Internet. They renamed the company Medmanager Interactive. They initially focused on diabetes but were also looking at other diseases such as Chronic Obstructive Pulmonary Disease (COPD). They worked very hard and produced some excellent tools that supported reading glucometers and storing the data in a personal health record. This capability would have been extremely valuable as it would give family doctors an accurate record of blood sugar levels.

Unfortunately no one wanted to pay for the service, even though it could have saved the government and insurance companies a substantial amount of money. After significant effort, the business was closed in 2011.

9.5 Awards

9.5.1 Award of Excellence in Graduate Supervision - University of Waterloo - 2006

In 2006 one of my graduate students, Bill Malyk, nominated me for the graduate supervision award of the University of Waterloo. This nomination was an incredible honour; Bill had to write the nomination and then solicit letters of support from many of my former graduate students. I was very fortunate in receiving the award.

9.5.2 Grand Cross of Scientific Merit, Brazilian National Order of Scientific Merit - 2007

In 2004 my friend Carlos Lucena, Mr. Computer Science in Brazil, nominated me for the Grand Cross of Scientific Merit, Brazilian National Order of Scientific Merit, Brazil's Highest Civilian Scientific Honour. I received notification from the Minister of Science and Technology that I had received the award in 2005 and the letter said the ceremony would be held at a date to be announced, where the presentation of the award would be made by the President of Brazil.

I kept asking Carlos when the ceremony was to happen. He did not know, even though he was meeting with the Minister of Science and Technology once a month in Brasilia. In the meantime I was contacted by the Canadian Embassy about a possible presentation of the award at a Brazil-Canada Economic conference in Sao Paulo in April 2007. Unfortunately, the presentation did not happen as the Brazilian President's office would not allow it.

Carlos was in a meeting with the Minister of Science and Technology in Brasilia on Wednesday October 3, 2007 and asked again when the ceremony would occur. The Minister said the ceremony was Wednesday October 10, 2007 and the letters had been sent out. The response was that no one had received the letter of invitation. Oops!!!!! The letters were sent out by e-mail immediately and Carlos asked if I had received mine. The answer was no, they forgot the foreigners. I finally received mine on Friday about noon. I told Carlos my chances of getting to the ceremony were just about nil.

Now the fun began, as I needed a visa on a Friday afternoon of a Thanksgiving weekend. I phoned the Brazilian Embassy in Ottawa, first the visa section (left a voice mail) and then the ambassador's secretary (no answer). I had given up hope when one of the visa people called back,

Figure 9.2
Don receiving his award from Luiz Incio Lula da Silva (Lula), the President of Brazil

and said I should go to the consulate in Toronto. I pointed out that they never answered their phone. This person asked me to send an e-mail outlining the situation, and he would forward it to Toronto, but no promises. Nothing happened all afternoon; so much for the ceremony.

I arrived home for dinner at 6pm and the phone rang. Marg thought it was a tele-marketer and almost didn't answer it. Thank goodness she did, it was Jose Jungblut, the Deputy Consul of the Brazilian Consulate in Toronto. He asked me when I would like to pick up my visa. I said how about Saturday morning at 10am? He replied we will be here. I drove to Toronto on Saturday morning and sure enough they were there. Twenty minutes later I had my visa for free (the usual cost is $80). I thanked Jose profusely and his parting comment was: "When our President invites you to our country, we make sure you can get there." By the way Marg decided not to go as it was just too last minute.

I then notified the Canadian Embassy in Brasilia as they had been so helpful in trying to arrange the ceremony in April. Monday night (Thanksgiving Day), I left for Brasilia via Sao Paulo arriving in the capitol about noon on Tuesday. Much to my surprise under my hotel room door was an invitation from Paul Hunt, the Canadian Ambassador to Brazil to join him for lunch with some guests. In the morning I took a guided tour of Brasilia since I had not been there since 1969.

I then went to the Embassy for lunch and as Carlos Lucena and Gustavo de Carvalho Robichez were in Brasilia for meetings and to attend the ceremony, they joined me. The ceremony was at 3pm and Paul Hunt accompanied us. I was presented with my box of medals by President Luiz Incio Lula da Silva otherwise known as Lula. It was a great trip, in spite of the foul up, the Brazilians were most helpful.

Just as footnote I was in the Sao Paul airport in 2010 wearing a University of Waterloo baseball cap. The lady in front of me in the line said they had had someone from Waterloo at the Canadian Embassy a while back. I said "that was I." The woman was Mrs Hunt and we had a great chat in the line, until we boarded the plane. She was on her way to Canada as Paul had just been made Ambassador to Israel.

9.5.3 Waterloo Award - 2009

In summer 2009, I received a call from Garry Bezruki, the information technology manager for the City of Waterloo asking if I would let my name stand for a City of Waterloo's award the City's highest civic honour for outstanding contributions to the Waterloo community. As you can imagine I was delighted and was even more surprised to receive the award from Mayor Brenda Halloran at a meeting of City Council in October 2009. I received the award for building the Waterloo Information Network, described earlier, and for advising the mayors and other administrators on information technology.

9.6 Health

Marg and I had a few parts replaced during this decade. In 2003, Marg had knee replacement surgery after having very sore knees for a few years. We both had cataract surgery in 2005. In addition my prostate kicked up.

My cataract surgery was very successful, I couldn't believe the difference. I went from coke bottle bottom glasses to being able to drive without them. Incredible!!! Marg was not so lucky. The first operation resulted in a 1 in 10,000 retinal bleed in the right eye and had to be stopped before the new lens was installed. The surgery was eventually completed six months later. They were able to operate on the left eye and that was successful.

9.6.1 Prostate

My prostate blocked my urinary tract shortly after we returned from India in 2008 and I was booked for surgery in January 2009. I spent a very uncomfortable Christmas with a catheter and a urinary tract infection. I had surgery in January, but then needed surgery again in February as some debris from the original surgery blocked the tract again. I had one more surgery in June 2010 to fix a few more issues. Each time it was day surgery, so I only spent a few hours in hospital and then recuperated at home.

Chapter 10

The 2010s

10.1 Health

As the decade moved on, Marg ran into health problems that required various forms of surgery and treatment and finally resulted in her death on January 21, 2019.

10.1.1 Heart

One Friday evening in February 2013, Marg went to bed as she was feeling tired. I heard a thump and went upstairs to find she had collapsed and hit her head on the bathroom cabinet causing her to bleed heavily.

We called 911 and they took her to Grand River Hospital, where they decided she had stumbled because of too much brandy. As Marg was leaving the hospital on Saturday morning after finally being stitched, they mentioned she had a heart murmur.

We decided to go to the movies on Sunday afternoon for a movie Marg had wanted to see. She was getting out of the car and saying she was feeling a bit off. I suggested going home, but she insisted on continuing to the movie. As we entered the theatre (Princess Twin in Waterloo), Marg collapsed. Fortunately there were three doctors in line in front of us. They immediately stepped in; one doctor gave heart massage and 911 was called.

Marg was taken to the cardiac unit at St Mary's Hospital on Sunday February 17, 2013, where they discovered that Marg needed a heart valve replacement. She had open heart surgery on Thursday February 21, 2013. She came home on March 12, 2013 with the red pillow that she had to use to relieve stress on her chest where they had her breastbone wired back together. I spent time with her while she recuperated over several weeks.

Marg recovered quite well and we were able to take a couple of trips in 2014 and 2015 to Europe and Alaska respectively.

10.1.2 Cancer

Marg had been feeling uncomfortable in her abdomen for quite a while and so finally our family doctor recommended some exploratory surgery in London. The surgery took place on Monday

January 25, 2016. Unfortunately, they discovered ovarian cancer, commonly called the silent killer, and so performed a major hysterectomy. At that point Marg was given 12 to 15 months to live.

We were sent home on Thursday January 28, 2016 from the hospital in London. We were then scheduled for chemotherapy. A side effect of chemotherapy is neuropathy, where you lose feeling in your extremities. Marg stopped driving and we sold her 2008 Honda with 14,000 kilometers on the odometer to our son Mike.

Marg motored along, although she did not stray far from home except for grocery shopping and the odd meal out. However, on June 16, 2018 we travelled to Toronto to the Royal Alexandra Theatre for a matinee performance of "Come From Away," a musical that she wanted to see. Marg thoroughly enjoyed the musical; it was everything she expected.

She was suffering many of the side effects of the cancer including a bowel blockage, which did not appear to be caused by the cancer according to all the imaging. She eventually went to the hospital by ambulance on Saturday August 4, 2018, because she was very uncomfortable. After a comprehensive examination over the next 24 hours, they concluded that the blockage was caused by the cancer and she had surgery on Sunday night to create a double-barrel colostomy.

From there she spent two weeks in hospital and then was transferred to Lisaard House in Cambridge for palliative care, as we did not expect her to come home. Lisaard had a three-month limit on stay, as most people are only there for a week or so. Marg stayed so long, she was "kicked out" and had to move to Columbia Forest, a long-term care facility. She was there for about 2 months in a very nice room overlooking the woods behind the facility. Of course I spent most of the day with Marg, and kids and grandkids dropped by quite frequently.

We had an enjoyable Christmas at Columbia Forest. All the grandchildren were there including Sarah, who flew in from Australia where she was spending her third year at the University of Queensland in Brisbane.

Marg passed away on January 21, 2019 at about 8pm in the evening. I had just gone home for some dinner, and Mike had come to sit with his Mother. He phoned me to say that staff told him it would not be long. By the time I got back to Columbia Forest, she was gone.

10.2 Losing My Wife

Losing my wife to cancer was very difficult. I still miss her very much. The funeral was held on February 2nd, 2019 at All Saints Church in Waterloo with Pastor Marty Levesque officiating. Her published obituary is shown in Figure 10.1. At her request I gave the eulogy, which is in the next section. Marg was cremated and her ashes were scattered on August 22, 2019 at the base of a memorial stone in Parkview Cemetery in Waterloo. The memorial stone is right behind her Father and Mother's.[1]

10.2.1 Eulogy for Marg Cowan

Thank you for coming to celebrate the life of Margaret June Cowan. Thank you to everyone who sent a message, provided a donation, or supported the Cowan family in other ways, including those who visited Marg as she battled cancer. Margaret preplanned this celebration of her life, and asked that I give a short eulogy. Marg did not prepare the eulogy; I take full responsibility.

[1] Only her Father's ashes are scattered in Parkview; her Mother's ashes are in common ground at St. James Cemetery in Toronto.

COWAN, Margaret June (nee Short)

Published: Jan 25, 2019
Event Date: Jan 21, 2019

Margaret June COWAN (nee Short)

COWAN, Margaret June (nee Short) June 2, 1939 - January 21, 2019 Margaret died peacefully at Columbia Forest Long Term Care, where she was receiving palliative care for cancer. Margaret was born in Gosport, England and immigrated to Toronto, Canada in 1952 with her parents and brother. Predeceased by her parents Leonard and Winnifred Short. She is survived by her brother Clifford Short (Ingeburg), her loving husband Don Cowan, her three children John (Shelley), Michael (Beverly) and Christine (Christopher Murray) and her five granddaughters (Sarah, Meghan, Kaitlin, Heidi and Madelyn). Margaret and Don married in September 1960 and immediately moved from Toronto to Kitchener-Waterloo, where with her brand-new Registered Nursing degree from the Atkinson School of Nursing at Toronto Western Hospital, she joined the nursing staff at KW Hospital (now Grand River). The next year she transferred to St. Mary's Hospital where she spent the next two years before joining the nursing staff in a local doctor's office. In 1965, Marg and Don started their family and Marg focused on childcare while keeping her hand in nursing through many fill-in positions including nursing at Camp Tawingo. Marg also focused on giving back to the community through her active participation in the May Court Club, their Christmas Dreams Fundraiser and the May Court Shop. There will be no visitation. A celebration of life service will be held at All Saints Anglican Church, 400 Northfield Dr. W., Waterloo, Ontario on Saturday, February 2, 2019 at 12 noon. A reception will follow the service. Cremation has already taken place with a family interment to occur at a later date at Parkview Cemetery, Waterloo. The Cowan family wants to thank all of our many friends who have supported Margaret during her journey. Special thanks also to Columbia Forest, Lisaard House and Grand River Regional Cancer Centre for their excellent care during Marg's long battle. In lieu of flowers, condolences for the family and donations to Lisaard House or The Gies Family Centre, c/o Hospice of Waterloo Region may be arranged through the **Erb & Good Family Funeral Home** , 171 King Street South, Waterloo at www.erbgood.com or 519-745-8445 as well, at the church prior to the service.

PHOTOS

ERB & GOOD
FAMILY FUNERAL HOME

Figure 10.1
Marg Cowan's Obituary

Before I talk about my wife, I would like to thank my children John, Michael and Christine, their partners Shelley, Beverly and Christopher, and my grandchildren Sarah, Heidi, Katie, Meghan and Maddie for their incredible support and kindness during Margaret's recent difficult journey. They did an amazing job of looking after their Mother and Father, Grandma and Grandpa.

Most of you met Margaret in Waterloo, and I would like to tell you a little about Margaret's early life in England and Canada. Margaret was born in Gosport near Portsmouth England on June 2, 1939, just before World War II.

As part of the evacuation of coastal ports, Margaret, her brother Cliff and their Mother Winnifred ended up in Tewkesbury in rural England living with her Mother's Uncle Rag and Aunt Elsie. Margaret's Dad, Leonard Short, was rather busy serving on British aircraft carriers.

During her illness Marg was given this toy dog by her daughter-in-law Bev. She named it Tatters after one of Uncle Rag's dogs. Margaret was little more than a toddler during the war, on a property that became an American supply base. She confessed that she had a wonderful war. She had the run of the estate, and was spoiled by the American troops at the depot. Of course, she had trouble pronouncing her name and was known as "Margy Lort" rather than Margaret Short, but knew enough to say to the American troops "Got any gum chum?".

The family returned to Portsmouth near the end of the war, and her Father was demobilized and joined them. Times were tough in England after the war, and so the decision was made to immigrate. Different countries were considered; thank goodness they chose Canada. Dad came a year early in 1951, and worked for De Haviland and then A.V. Roe, and then switched to building management and maintenance. Just a year after arriving in Toronto, the Queen threw an incredible party to celebrate Margaret's 14th birthday on June 2, 1953. I believe it was called a coronation.

After moving a number of times, Marg ended up at York Memorial Collegiate Institute, where yours truly was a student. We first met when Marg was in Grade 11 and I was in Grade 12; true high-school sweethearts. Marg became part of our extended family and was well liked by everybody.

After completing high school and post-secondary education, Marg in Nursing and Don in Engineering, we married in 1960 and came to Kitchener-Waterloo. Marg to pursue a career in nursing and Don to join the University of Waterloo. We planned to stay for a year over 58 years ago.

Marg was very supportive, buying our two houses over 4 years, putting up with me being chairman of Computer Science at age 28 and living in four different countries (Canada, Brazil, California, Switzerland).

This was while we were raising a family with John in 1965, Mike in 1967 and Christine in 1970. Marg did most of the child-rearing, particularly while I gadded about the world trying to hire people in the exciting field of computer science.

Although, I thought I knew my wife, I learned from the many comments about what an incredibly supportive person she was. She welcomed people from all over the world into our home and our lives. She was a natural listener; as she used to remind me. Being an engineer, I want to fix things, whereas she recognized that most times, just listening and sometimes responding often fixes the problem.

She was incredibly adaptive as we moved around the world, fitting in with the local people but ensuring that our children were polite and respectful. It sometimes meant that she had to say no. Marg nurtured many relationships, particularly our 50 years with Brazil.

As to her being adaptive I think of Margaret in Brazil, when she tried to buy an essential household item called a "saca-rolhas" (pronounced saca-rolyas). She visited many stores in Rio and got blank looks when she asked for it in Portuguese "voce tem um saca-rolhas?" Finally, she found a store where they spoke English and she asked for the item. They produced the item and when she

asked what is was called in Portuguese. They said "saca-rolhas." To this day she does not know, why she was not understood. By the way "um saca-rolhas" is "a corkscrew."

As we entered, Switzerland, to live there, my wife saw the prices and immediately retreated to the hotel bathroom and started crying. She did not see how we could survive as the Swiss Franc was a lot higher than when I was hired by IBM Research. But Margaret adapted to expensive Switzerland, we had great meals, took full advantage of the ski season, travelled a lot, even ate out once in a while, and had enough left over to buy a new car when we returned to Canada. She was a great manager.

Marg would tell you she was not an athlete, but encouraged her family by participating herself. So, with the urging of our friend Dorothy Dunkley, she took up both cross-country skiing in the early 70s, and in the winter before we left for Switzerland, she learned the rudiments of downhill skiing. From that point on we cross-country skied every winter and the family with many friends spent the March break downhill skiing at various locations. Although, she was an active participant, I can remember her frustration at times and her throwing her skis down a Swiss Alp. Thank goodness they did not go too far.

Although Marg often travelled with me when I was on business, she really hit her stride when I retired in 1996. Travelling with Marg was exciting and rewarding. The beautiful part of the travel was that once we agreed on a location, she did all the work and planning. We had wonderful travel experiences visiting every continent except Australia.

Although Marg was married to a geek, she was never comfortable with technology. She would send e-mails through her social secretary, me. She would hand write the note and then I would type it and send it.

This community has been kind to us and our family. We have had a wonderful life here, raising an incredibly supportive family, making many friends, many of whom are here today.

Hopefully through my ramblings I have given you some idea of Marg and her supportive personality. I would like to close by partially quoting from an e-mail that was sent to our family in the Fall of 2018, when Marg was going through a health crisis. I believe it captures my wife very well.

"I dont need to tell the four of you what an amazing woman Marg is, but I do want you to know how much I have always admired her. Your mom/wife has always listened to my ramblings and cared about my life whenever I popped by for a visit. And I know that I am not alone in these thoughts. My entire family has always felt a special bond to both your mom/wife and all of you. I know my mom, in particular, has mentioned to me after calling Marg for advice on some matter that she is the older sister my mom never had."

Thank you for coming and listening to me today, talking about my soulmate and love of my life. God bless you Margaret.

10.3 The Family

Our family, John and Shelley, Mike and Bev, Chris and Chris continued to motor along through the decade acquiring various animals including four dogs and a horse.

10.3.1 The Granddaughters

Meghan, Katie and Maddie all attended Centennial Senior School for Grades, 7 and 8. This is the same school that Christine, Mike and John also attended.

Figure 10.2
The Cowan Family Christmas 2016
Back Row: Mike, Bev, John, Shelley, Christine, Christopher
Front Row: Marg, Meghan, Sarah, Heidi, Maddie, Katie, Don

The granddaughters then moved on to high school. Sarah and Heidi at Huntsville High School, where their Dad is a teacher. Katie and Madddie enrolled in Sir John A MacDonald Secondary School in Waterloo and Meghan went to Waterloo Collegiate.[2] Meghan went to a different school because of her early interest in playing the violin.

Sarah and Katie have since moved on to St Jeromes University at the University of Waterloo, both in Honours Arts. Sarah is now in her fourth year, having spent her third year as an exchange student at the University of Queensland in Brisbane Australia. Katie is in the second half of her first year. Meghan finished high school, but has taken a year off to ride her horse, the one I mentioned earlier.

Heidi and Maddie are both in Grade 11 and doing well, so 1 1/2 years to go before the next steps.

10.4 Ralph Stanton - Loss of Another Mentor

Ralph Stanton (https://en.wikipedia.org/wiki/Ralph_Gordon_Stanton) and I kept in touch over the years, even though Ralph left the University of Waterloo in 1966. After a short period at York University, Ralph moved in 1970 to the University of Manitoba to become the Chair of Computer Science. Ralph was often in Waterloo and we would visit back and forth. Ralph was an incredible mentor, worked with me on publications and guided my career in many ways. Remember his comment found in Section 6.3.1, when I thought about moving to Queen's University.

Ralph died on April 21, 2010 in Manitoba and left quite a legacy of former students, colleagues and people he had mentored. Being Ralph he did not believe in spending money unnecessarily. Ralph left his body to the medical school as they would pay for burial. He also bought his clothes from second-hand shops such as those run by the Salvation Army.

A memorial service was organized for October 23, 2010, which would have been Ralph's 87th birthday. Most of the service was about telling Ralph stories of which there were many. Ralph could scare the devil out of you, but at the same time was extremely kind and helpful. My own experience is a strong indication of that. Ralph was always willing to support you, as my early experiences that I have already described, as an undergraduate, graduate student and in my career indicate.

10.5 Research

UWCSG continued to grow and added Marcus Doran[3] (2010). The research program did not change much from the previous decade, but did advance in various ways such as creating a prototype of the socially smart community in the City of Stratford and the Counties of Perth and Huron (https://www.myperthhuron.ca/).

However, the research agenda on web-based and mobile systems was continuing. The goal of this specific research agenda is "to get rid of programmers." By that we mean, can users of information technology build their own applications? There will still need to be expert programmers to build new data structures and tools. The research program has so far attracted over $22,000,000 in funding from many different agencies.

[2]Waterloo Collegiate is the high school that Christine, Mike and John attended.

[3]Marcus left UWCSG after about 4 years although he remains connected to us.

10.5.1 Brazil

Carlos and Marisa stopped coming to Waterloo in 2013, because Carlos suffered a stroke. Although somewhat incapacitated, Carlos continues to run his software engineering lab at the Pontifical Catholic University in Rio. He continues to send students to Waterloo, both graduate students and postdoctoral fellows. I continue to work with Carlos and expect to visit him annually for two weeks each year; the first such visit occurred in 2019.

Paulo Alencar continues to work with me on research grant proposals and related research. He has worked with me as a research professor since 1995. Toacy Oliveira also continues to come to Canada for the winter to work with Paulo and me on research related to processes in software engineering and workflow.

A pleasant surprise is how the children of the Lucena's (Alex, Fernanda, Andy and Beto) and the von Staa's (Betina, Ricardo[4]) have continued the relationship with Waterloo. After selling their company EduWeb,[5] which built and sold educational software, Alex Lucena joined Desire2Learn[6] in Kitchener, as the marketing manager for Latin America. He and his family lived in Waterloo for two years, while he developed the position. One of the first things he did was to hire Betina von Staa, who worked for an educational computer company in Brazil, to work with him. She remained in Sao Paulo, but travelled often to Waterloo. Both have since left D2L and moved on to other things.

Beto Lucena, after finishing his PhD, came to Waterloo to do a postdoctoral fellowship with Catherine Burns, a user experience expert. He was accompanied by his wife Marcela and his two young boys. They liked being in Waterloo so much that they now live here permanently. Both Beto and Marcela have jobs in the local community.

Ricardo von Staa decided to move to Canada and now lives in Waterloo with his wife and three children. He works for a company based in California.

10.6 Going into Business Again

Recently our group has established four companies to make all the UWCSG software technology available that has been built from the UWCSG research program over the last two decades.

10.6.1 WIDE Software Systems Corporation - called WIDEAtlas

A company named WIDE Software Systems Corporation (WIDEAtlas) was incorporated in 2012 to make all the technology available. WIDEAtlas would licence the technology such as the WIDE Toolkit to companies in which WIDEAtlas would have partial ownership. So far, three such companies have been established, which are described next. WIDEAtlas is owned by the members of the UWCSG research group and people who have a close relationship with our team. My family owns 21% of WIDEAtlas.

[4]Both are Canadian citizens; they were born while their Father Arndt was studying for a PhD in Waterloo.

[5]EduWeb was a company set up by the three Lucena brothers, Alex, Andy and Beto and was sold to a large Brazilian publisher.

[6]The company is now called D2L and was established by three UW students in 1999.

10.6.2 VolunteerAttract

VolunteerAttract (https://www.volunteerattract.com/) is a company incorporated in 2015 that creates software for the volunteer community and was based on our ten years experience with the Volunteer Centre in Waterloo Region, Volunteer Canada and other Volunteer Centres across Canada. There are three components supporting the 3Rs of volunteering, Recruit, Retain and Recognize.

The Recruiting software matches volunteers with volunteer positions. The Retain software provides facilities to manage volunteers once they are in a volunteer position. The Recognition software provides a certificate that not only says "thank you," but outlines the tasks performed and the skills learned. These days, such a recognition can be valuable as part of a job application.

The Recruiting software is now used by many of the volunteer action centres across Canada and supports the Prime Minister's youth volunteer program through Volunteer Canada.

There is a business model behind VolunteerAttract named VolunteerTwice that involves sharing the profits with the volunteer centres through Volunteer Canada.

The company is operated by Kyle Young as CEO with one employee, Chris Lee. Chris Lee is of Korean background and studied software engineering at the University of Waterloo.

10.6.3 CivicAtlas

CivicAtlas (https://civicatlas.com/) incorporated in 2016 is derived from our earlier research on information systems to support land use. CivicAtlas uses aggregated data, data analytics and artificial intelligence (AI) technologies for land-use decision making. The objective of the company is to serve industries related to property development and regulatory agencies.

Currently, CivicAtlas is not operating, while the CEO of the company, Terry Popowich seeks up to $5,000,000 in investment.

10.6.4 Driftscape

Driftscape (https://www.driftscape.com/) is a mobile app that provides a platform for local organizations to share site-specific stories, tours and events. In effect, Driftscape allows the sharing of community content. The Driftscape app is available for both Android phones and iPhones.

For Users, the Driftscape app is free and provides a great way to explore what's around you. Simply select what you're interested in and start walking. Youll be notified when there's something of interest nearby. For Organizations, Driftscape is a powerful tool to help tell and present stories about a community.

Driftscape is operating and has a large number of users and organizations, although it is still expanding across North America.

10.6.5 Waterloo MedTech

I have developed an interest in innovation in community-based health care over the years, partly based on my interest in Medmanager Interactive and also my work with Dominic Covvey on Health Informatics. One day in 2013, I was suffering from sciatica and encountered Dr. Doug Dittmer, a rehabilitation doctor or physiatrist. After 5 minutes, a program for managing my sciatica had been determined, and we spent the next 40 minutes talking about the lack of innovation in community-based health care. Doug had the idea of setting up an environment in a hospital setting where

innovators (engineers and scientists) could interact with healthcare personnel to assess and create existing and new ideas.

We engaged with a number of other people from the medical community, the University of Waterloo and the general community and in 2017 established a not-for-profit called Waterloo MedTech.[7] The objective of Waterloo MedTech is create the environment just described in the previous paragraph that supports innovation in community-based health care. We are still working toward establishing that environment.

10.7 Current Outside Investments

As well as our investments with Rae & Lipskie, we have private investments in some startups. These are described next.

10.7.1 Aterica

Aterica (https://www.aterica.com/) is a company that specializes in food allergies. It has created Veta, an EpiPen smart case that alerts people through their cell phone when an event occurs such as being too far from the EpiPen. They also have portable allergy testing equipment that is not yet ready for production. Although they made a deal with Walgreen's in the U.S to sell their case, as of this writing they have run out of money and will be sold, probably for a tax loss.

10.7.2 Blue J Legal

Blue J Legal (https://www.bluejlegal.com/ca) builds and sells AI-powered platforms that accurately predict court outcomes and enable tax lawyers and accountants to find relevant cases faster than ever before. The company is currently backed by investors such as Thomson-Reuters and KPMG. The product is used by a number of accounting firms including my own accountants Pricewaterhouse Coopers.

10.7.3 Acumenex

Acumenex (http://www.acumenex.com/) is a company that builds and operates e-commerce sites for the both the optical and veterinary sectors. The company has struggled but seems to be making inroads on the veterinary side.

10.8 Travel

We were not able to travel very much after 2013, but did enjoy some excellent trips early in the decade. Details can be found in the section on personal travel.

[7] The Founding Members are: Garry Bezruki, Don Cowan, Doug Dittmer, Shirley Fenton, Brian Vartian and Mark Whaley

10.9 Honours

10.9.1 ACM Distinguished Scientist - 2010

The Association for Computing Machinery (ACM), the world's premiere organization for computing professionals, has several honours including Distinguished Scientist and Distinguished Engineer. Ian Munro, one of my colleagues in Computer Science at Waterloo nominated me for the position of Distinguished Scientist and I received the honour in 2010.

10.9.2 Doctor of Science, honoris causa, University of Guelph - 2011

A colleague at the University of Guelph phoned one day early in 2011 and asked if I would let my name stand for an honorary degree. The answer was easy; I said yes. Of course, even though nominated there were no guarantees as the nomination process often includes several names. Much to my delight, I was offered the honorary degree of DSc and invited to address convocation at the University of Guelph. I was extremely pleased to attend and receive the degree. Quite a few members of my family also were in attendance.

10.9.3 CS-Can/Info-Can Lifetime Achievement Award in Computer Science 2017

In 2017, Ian Munro nominated me for the Lifetime Achievement Award in Computer Science. This award is given annually by CS-Can/Info-Can whose mission is to foster excellence in computer science research and higher education in Canada, drive innovation and benefit society. CS-Can/Info-Can is the focal point for computer science research and education in Canada. CS-Can/Info-Can members include the leading computer science researchers and educators at the university level in Canada.

Each award recognizes a small number of current or former faculty members in Canadian Computer Science Departments, Schools, Faculties who have made outstanding and sustained contributions to computing over their careers. The awards can be for achievement in research, teaching, service, or any combination of these. I was fortunate to receive this award.

10.9.4 AWARD OF MERIT, for contributions to software development for the Volunteer Action Centre, 2017

The Volunteer Action Centre of Waterloo Region (https://volunteerwr.ca/) established a new award in 2017 to honour innovation in the volunteer sector. Kyle Young and I were the first recipients of this award for our contribution to the development of the software for the volunteer community.

Chapter 11

Life Lessons

What did I learn from my life experiences? Obviously lots of details; but what are the big issues?

- Mentor - be a mentor; pass on the valuable lessons and skills you have learned over your lifetime and career. Each individual has learned an incredible amount of knowledge and experience through their lifetime. I believe my life has been significantly influenced by my many mentors including my parents, my uncle Donald, Ralph Stanton and Wes Graham.
- Try to be enthusiastic about everything you do. This is not always possible, but it is a goal for which to strive.
- Learn how to sell yourself and your good ideas. If you want your thoughts and ideas accepted, then you must learn to describe them in a positive and engaging manner in terms that people can understand.
- Be a team player. No one person has all the good ideas. Small friendly teams are always more productive.
- Recognize the members of your team and make sure they receive appropriate credit; after all they make you look good.
- It is easier to beg forgiveness than ask permission. If you have an idea that makes sense, then go for it. If you ask permission, then the easiest answer is almost always "no." The real innovators don't believe in "no" for an answer.

Appendix A

Travel for Pleasure

Up until 1994, my wife Margaret and I travelled mostly on business, attending conferences and similar activities. We often added some pleasure travel on one end or the other, but the rationale for the trip was usually some form of business related to my position as a Professor of Computer Science. Starting in 1994, we started travelling for sheer pleasure and curiosity and covered quite a bit of the world. After 1999, we travelled a lot, and rather than scatter all the details of each trip after 1999 through each section, I thought it would be easier to capture the information in one section to which I can refer. So here goes. The trips are presented in order by date after 1999.

A.1 Cruising the Middle East - 2000

We had planned to visit the Middle East (Syria and Iraq - before they fell apart) with Jeff and Jean Weller (remember them - Peru and Morocco). However, the trip did not happen. We were looking for something else when we found an ad for Swan Hellenic, a boutique English cruise line in the Globe and Mail. The ad described a cruise in the Middle East starting in Aquaba in Jordan and going through the Red Sea and into the Persian Gulf debarking at Dubai.

What an unbelievable trip starting in November and arriving home in early December. We flew to Aquaba through London. Our first site was Petra, the city carved from sandstone - spectacular. You enter Petra through a hole in the rock and the guide asks you to close your eyes for the last few yards. What a sight when you finally emerge.

Then on to the port of Safaga in Egypt where we went by coach with an armed guard to the Valley of the Kings. The armed guard was because of a previous terrorist problem. Back across the Red Sea to Jeddah in Saudi Arabia. We were in the middle of Ramadan and so we had to make sure we were not visible when we ate or drank.

We left Jeddah and moved on to Sharm El Sheikh on the Sinai peninsula, where we visited St. Catherine's Monastery. From there we were heading for Aden in Yemen. Unfortunately we could not land as al-Qaeda had conducted a suicide attack on the USS Cole in October of 2000 and the captain did not want to risk the ship.

We rounded the corner and landed in Oman. My most memorable site is a ToysRUs store holding a Ramadan sale. From there we moved onto Dubai, where we connected with my cousin Norman Salt, who drove down from Abu Dhabi to meet us. We had a tour of Dubai and visited several

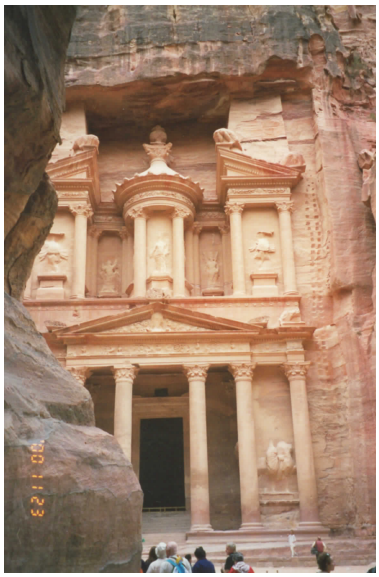


Figure A.1
Our first view of Petra, the Treasury

shopping malls. In one, if you made a purchase you had a chance of winning one of several luxury cars, the other mall increased the ante, the prize was $1,000,000 in gold bullion. Norman treated us well taking us to the Burj Al Arab hotel for a fantastic meal with wine. From there it was on to the Dubai airport for the flight to London and home to Canada.

A.2 Antarctic Cruise - 2002

In February 2002 we went on an Antarctic cruise with Holland America. The cruise started in Valparaiso Chile and ended in Rio de Janeiro. We sailed down the coast of Chile and then to Punta Arenas, Chile and through the Straits of Magellan to Ushuaia, Argentina, and then across the Drake Passage to the Ross Sea on the edge of Antarctica. The Drake Passage is known to be rough and most passengers get sick. However, our passage was smooth as glass.

We then cruised around the Ross Sea, dodging large icebergs. Part of our crew complement was a retired American Coast Guard Captain, who piloted icebreakers and took us safely through the ice.

From Antarctica, we sailed north and passed Elephant Island, where Shackleton landed with his crew after his ill-fated Antartic expedition. From there, our ship proceeded to the Falkland Islands where the sheep outnumber the residents. There are 4,000 people and 500,000 sheep. We had a fascinating tour of East Falkland and the capital Stanley. There were still many mines buried from the 1982 war.

From Falklands we proceeded to Buenos Aires, Argentina and then to Montevideo, Uruguay. We had wonderful tours of both cities with lots of time to mooch on our own. We also had an

opportunity to visit an Uruguayan cattle ranch.

After we Uruguay, we sailed to Rio de Janeiro, Brazil where we visited with our old friends, the von Staas (Arndt and Carla) and the Lucenas (Carlos and Marisa). We have known both couples and their families since the 1960s. Arndt gave us a tour of the old city on the first day in areas we had not seen before. On the second day we journeyed to the Lucena's vacation home in Teresopolis in the mountains behind Rio. The next day we flew home to Waterloo.

A.3 England - 2002

During the summer of 2002, Marg and I decided to make an extended trip to England, where we would rent a car and tour around and visit some of our relatives. The car was an automatic, so I wouldn't try to open the door, while shifting gears.

We took the day flight, Toronto to London, a terrible mistake, as the flight landed just as Heathrow is closing down, which it makes it difficult to get any form of ground transportation. We finally hired a taxi to take us to our hotel in Staines where we stayed for a couple of days. We had the car delivered, rather than trying to drive from the airport. We toured around the area visiting Windsor and getting used to driving the car on the "wrong" side of the road.

From there we went to Portsmouth, Marg's home town, before she came to Canada. We parked the car and used public transport to get around. From Portsmouth, we travelled to Tewkesbury via Salisbury. Tewkesbury was where Marg spent the war years. Unfortunately we were not able to tour the Unwin estate, where she spent the war years (We stayed there with the Perret family, her Uncle Rag, Aunt Elsie and cousin Joan during our visit in 1961). A company had taken over the estate (the Tewkesbury Boys' Grammar School) and it was now "top secret" and not easy to tour.

From Tewkesbury we visited cousin Joan in her house in the Forest of Dean nearby, where she had moved with her Father quite a few years earlier. On to the Midlands where we hooked up with my Mother's cousin Doreen Ritchie in Derbyshire (Doreen and Dennis (her husband) had visited us in Canada in 1979) and her son Martin. We had a great visit and then moved on to Boston near Newcastle where we visited with Marg's cousin Graeme and his wife Janet.

From Boston, we worked our way south staying at Bury St Edmunds and visiting Cambridge and Sandringham. Finally, on to Heathrow and home.

A.4 Swan-Hellenic Cruise - Central America, Panama Canal - 2004

In 2004 Marg and I had the opportunity to travel to Mexico, Central America and through the Panama Canal with Swan Hellenic with visits to several Mayan temples along the way. We started in New Orleans.

Before leaving home, Marg had misplaced her nail file. She had put it in her shoe to take up stairs, but had left it in the shoe. She discovered the nail file when we boarded the ship, and she took off her shoes. This means she had walked through two airports and several security installations without them catching the deadly weapon. So much for airport security.

On the voyage, we visited Mexico, Honduras, Belize, Costa Rica and sailed through the Panama Canal and then spent a few days at a resort on the Panama Pacific coast. Marg was suffering from

the after effects of her first knee surgery, and so took gentle side trips. I visited several Mayan ruins including flying to Tikal in Honduras. What an incredible experience.

A.5 Circumnavigate Newfoundland - 2004

During the summer of 2004, we had the opportunity to circumnavigate Newfoundland by ship with Adventure Guide with visits as well to Labrador and the French islands of St Pierre and Miquelon.

We flew to St John's and spent a couple of days in the city before boarding our cruise ship. During our time in St. John's we connected with my old high school friend Harold Paddock, who was retired as a professor from Memorial University. It was a great reunion. As Harold said when he returned to Newfoundland from Toronto, he tried fishing, he tried logging and he discovered he was for thinking.

We visited many places around the coast including several outports, St. Anthony (the Viking settlement) and Gros Morne. At Gros Morne we were treated to a concert by two women who were working to preserve the Newfoundland culture by teaching "Newfie" songs to children in summer camps. These two women later came to Waterloo and presented a concert at the Button Factory, a local arts venue.

A.6 North India - 2004

In 2004 we were lucky to connect with Ken Tham, a legendary tour director, who took us on a personally conducted tour of North India starting in Delhi and ending in Mumbai. This trip was one of many we took with the University of Toronto Alumni Association.

The trip was an incredible journey by train where we visited the Taj Mahal, as well as many of the splendid palaces of the Raj including many other interesting sights including Varanasi, the holy cremation site on the Ganges River. The Taj Mahal was particularly spectacular as we visited at sunrise as the sun rose and glinted off the marble facade. We would often get off the train and take a two or three hour bus ride to see some specific things. Driving down a street while competing with Tuktuks (passenger motor scooters) and elephants was an interesting experience to say the least.

Our final destination was Mumbai, where we stayed at the famous Taj Mahal hotel, across from the India Gate. From there, it was flying home via Brussels.

A.7 Genoa to Dover Cruise - 2005

In 2005 we went with the University of Toronto Alumni tours on a cruise from Genoa to Dover visiting various ports. We visited the cost of Southern France and then Barcelona followed by Gibraltar and Lisbon. Barcelona is an incredible city with the famous Temple Expiatori de la Sagrada Famliac, still unfinished. Then around the corner to Bilbao in Basque country, where we visited the famous Guggenheim Museum designed by the Canadian architect Frank Gehry. From there we journeyed to Dover and flew home.

Figure A.2
Marg and Don in front of the Taj Mahal in Agra India

Figure A.3
Marg leads her Terra Cotta Army in Xian China

A.8 China - 2005

In 2005, we linked up through the University of Toronto with our friend and guide Ken Tham. Ken had chartered a train that would take us from Beijing to Kashgar on the border of China with Afghanistan. We visited many sites, stopping the train and venturing by bus to new locations. Highlights were the Great Wall, the Terra-cotta army near Xian, Urumqui (pronounced Urumchi) and Kashgar. Urumqui and Kashgar are in the Muslim part of China and were quite interesting. The Chinese government was encouraging the Han Chinese (the native population) from farther East to move into the area.

A.9 Cruise Dalmatian Coast and Tour Italy and Switzerland - 2006

In 2006, we again joined the University of Toronto Alumni group for a cruise along the Dalamtian coast of what was Yugoslavia and is now several countries including Croatia and Serbia. We started in Venice and went along the Croatian coast as far south as Dubrovnik, a very popular spot for tour boats of all sizes, making the visit very uncomfortable. However, the cruise along the coast as a whole was great. We stopped at Zadar to see and hear the singing steps.

We returned to Venice and stayed there for a couple of days in our hotel from 1979, the Fenice. We then revisited the restaurant where we ate in 1979 with my colleague Luciano d'Andrea from IBM Italy, where we had black risotto or rice cooked with squid ink. The food was not nearly as good, and we returned to the hotel for dessert.

After thoroughly enjoying Venice, we rented a car and headed to Switzerland with stops at Lake Como to see the beautiful Italian Lake district. Then on to Ruschlikon, our home town in Switzerland from 1978 and 1979, where we camped at the Hotel Belvoir and visited local sights. We also met with our friend Harry Rudin and enjoyed dinner at his house with his wife and two daughters. Then we flew home from Zurich to Toronto.

A.10 Western China and Tibet - 2007

Again we connected with the University of Toronto Alumni travel and Ken Tham for a trip to Western China and Tibet. Another incredible experience. We flew to Hong Kong and from there to Kunming in Western China. Kunming is at an altitude of 6,234 feet and we were heading to Lhasa in Tibet at 11,975 feet.

There was a period of acclimatization, where we gradually climbed and eventually ended at Shangri-La (actually Xianggelila) at an altitude of 10,370 feet. The trip was fascinating as we observed Chinese culture and general life. From that point we flew to Lhasa. We explored Lhasa and the palace and climbed even further to about 14,000 feet, where we had emergency canned oxygen in the bus. While at that height we observed a market at the side of the road, populated by local Tibetans and their yaks.

From Lhasa we flew to Shanghai with an unscheduled stop in Chengdu, which is considered the home of domesticated pandas. We had an incredible experience visiting the panda enclosures and getting to know the pandas up close. We finally flew to Shanghai, where we stayed for a couple of days. Jan Carr, one of our travelling companions and I took the opportunity to take the MagLev

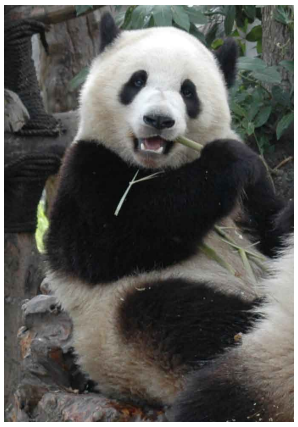


Figure A.4
One of the many panda bears in Chengdu China

high speed train to the airport (speed 268 mph) as a lark. What an experience. It only took 1 1/2 hours from our hotel to the airport and back. Not bad for a trip of 120 Kilometers on public transit. From Shanghai we flew home.

A.11 South Africa, Zambia and Botswana - 2008

In February 2008, Marg and I travelled with Adventure Canada on a wonderful safari to Southern Africa. We flew to Johannesburg and then after meeting our travel companions, 7 other people including our travel guide, Clayton Anderson, we boarded our own private plane to fly to Mala Mala, a private game park next to Krueger Park in South Africa. We landed at the airstrip and then the pilots proceeded to surround the plane with barbed wire, so the rhinos wouldn't chew the tires.

We sat down for lunch and a parade of elephants walked across the front lawn. We went looking for wildlife late in the afternoon. Excursions to see animals only occur in the early morning or late afternoon as the animals sleep during the day. Our first trip and we had the pleasure of seeing a cheetah sleeping in a bush. The animal woke up, stretched and wandered off. While at Mala Mala, we slept in a small hut, that contained a king size bed, two washrooms and a double sink. Of course the compound at Mala Mala was not fenced, so after dark, we were escorted from the dining room hut by an armed guard in case we ran into any wild animals.

From Mala Mala, we flew to Victoria Falls and stayed in Livingstone in Zambia. We flew over the Falls in a helicopter, rode on the river above the falls, and participated in some cultural events. Our guide came from Zimbabwe, but we did not enter that country as there were serious economic problems at that time during the administration of Robert Mugabe.

From Zambia we flew to Botswana and the Okavango Delta, where we stayed in the Mashatu safari camp under canvas. The tents were erected on an elevated walkway as the Okavango Delta floods starting in February, and travel later is by boat, although we travelled by safari jeep. The tent of course contained a king size bed, two bathrooms and an outdoor shower plus an exquisite

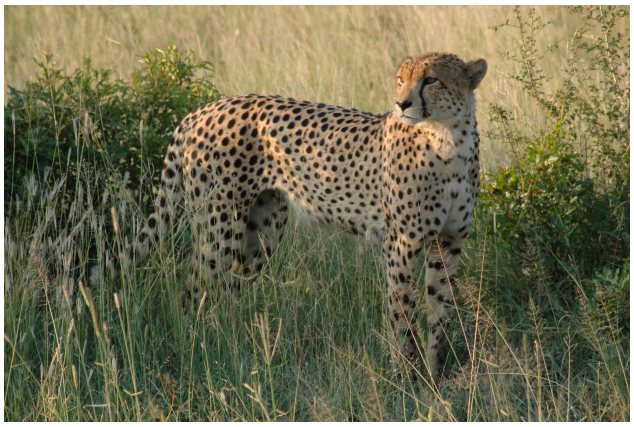


Figure A.5
A Cheetah seen on the first day at Mala Mala

dining room. Again after dark, you travelled with an armed guard in case animals such as leopards were lurking in the trees.

We saw an incredible selection of wildlife again, including leopards, lions, water buffalo, elephants and antelopes to name a few. We also had a spectacular helicopter overflight over the delta.

From the delta we moved on to Kwetsani camp in the narrow part of Botswana between Zimbabwe and South Africa. Another spectacular safari location with the same accommodation, but a wall around the camp. However, we were still guided back to our lodgings by an armed guard as leopards can still come over the wall.

After this final camp, we returned to Johannesburg in our private plane and caught the Blue Train from Pretoria to Cape Town. The Blue Train is a luxury train with incredible service and food. After an overnight trip, we disembarked in Cape Town and moved into the Cape Grace Hotel. Again a wonderful location right on the waterfront. We toured the area meeting up with Riel Smit and Pieter Kritzinger. Riel was my former PhD student and Pieter was Wes Graham's student in the early 1970s. We joined Riel for dinner as he was flying to Seattle that day as he worked for Amazon. Pieter toured us around the area taking us to Stellenbosch for some fine wine.

While we were in Cape Town, we toured a slum or township, which was gradually rebuilding. A large black gentleman was standing in front of his rather nice house and asked where we from? We replied a place you probably never heard of, Waterloo, Ontario Canada. His response was is that near Cambridge? It turned out that he lived at Victoria and Lawrence in Toronto, and spent the winters in South Africa with his family. We then met him later in a local restaurant.

That was the end of our African safari. A fantastic trip.

A.12 South India, Malaysia, Cambodia and Singapore - 2008

Our friend Ken Tham offered a trip through South India and Sri Lanka in November and early December in 2008. However, before the trip even started, Ken cancelled the Sri Lanka portion as the Tamil Tigers were causing significant problems that could put us in danger. Some of us asked if

Ken could add some other locations and so he suggested Thailand as an add-on. Off we started on what would be a very eventful trip.

First we flew to Mumbai (Bombay) and stayed at the Taj Mahal hotel. After two or three days in Mumbai, we flew to Goa and then took a tourist train back to Mumbai. After arriving in Mumbai, we met our guide at the Taj Mahal hotel, and she took us on a comprehensive tour of the city. We then drove to the airport and boarded our aircraft for a flight to Cochin.

Upon arrival in Cochin, we noticed everyone on the flight making calls on their cell phones, which we thought a bit weird, but just put it down to local custom. We went to the hotel, ate dinner and went to bed as it was getting late. Next morning we woke up, got the paper from the door. The headline was about the Mumbai Terrorist Attacks, which started on November 26, 2008 and we had missed by about three hours.[1]

Our tour leader Ken, was on the phone changing our itinerary, as the Thais had rioted and closed down the airport in Bangkok on November 25, 2008. He reconstructed our trip and we eventually went to Singapore, Malaysia (primarily Kuala Lumpur and locale) and Angkor Wat in Cambodia.

From Cochin, we flew to Chennai (Madras). Of course, a typhoon had gone through Chennai a few hours before and everything was flooded including the runway at the airport. However, we survived and stayed at the Taj Mahal hotel in Chennai. Of course we had to go and find Giggles, often described as the biggest little bookshop in the country. Marg had read about Giggles. What a delightful place and the proprietor Nalini Chettur was most helpful as we browsed the stacks of books.

From India, we travelled to Malaysia, where we primarily saw Kuala Lumpur and toured the Malacca Straits coastline. From there we travelled to Singapore, the city, which is also a country and scrupulously clean. Both countries were incredible experiences.

From Singapore, we traveled to Cambodia, where we visited Angkor Wat, an unbelievable sight. Amazing temple ruins. Marg had never wanted to go there, but was absolutely enchanted by the place. From Cambodia, we travelled to Kuala Lumpur and Chennai, where we stayed for a couple of days before flying on to Mumbai, and home. By then, the terrorist attacks were over and everything had returned to normal.

A.13 Cruise around UK to France - 2009

In 2009, the University of Toronto Alumni Association offered a trip in the North Sea starting in Dublin down the west coast of Scotland, England and Wales to the coast of France. We arrived in Dublin and after a short stay in a hotel and tour of Dublin, we boarded our French cruise ship operated by PONANT (https://us.ponant.com/), a French Cruise line.

We were supposed to go to Lononderry, but we ended up in Belfast as the landing area for Londonderry was too rough. From there, we went to Glasgow and by bus to Edinburgh, where the Edinburgh Festival was in full swing. We wandered around Edinburgh taking in the sites and then returned to the ship and travelled up the coast to Skye and other islands. We then stopped in Wales and went on a bus tour, where we were entertained by the World Champion Welsh Choir.

At some point on the boat we chatted with a couple and the usual “where are you from?” question was raised. Once we mentioned we were from Waterloo, they mentioned their friend Ron

[1] David Johnston, who was President of the University of Waterloo at the time had just arrived in Mumbai, turned on the TV in his hotel room, saw the carnage and immediately went to the airport and caught a flight to Toronto.

Figure A.6
A carving at Angkor Wat

Dunkley. Of course we had just met Jim and Wilma Spence, the only members of the Queen's University crowd we had not met.

We sailed down the coast stopping at St Michael's Mount off the coast of Cornwall. From there we crossed to France where we visited the beaches of Normandy. We had the opportunity to visit the landing beaches and of course chose the Canadian Juno Beach. We had the opportunity to visit the new museum and had the services of a young Canadian guide from Vancouver.

These cruises are offered to many alumni associations in both Canada and the United States and so there were a lot of Americans on the cruise who bring their own "experts." They often congregate in alumni groups under the school flag, whereas the Canadians are just Canadians. We had a Scots guide who could have given many of the lectures, particularly the one on plaids. He recognized that the Canadians relate to the Americans like the Scots to the English. He went to some trouble and found a large Canadian flag that he hung on the wall behind where we Canadians had dinner.

After this and a tour of Mont St Michel off the coast of France, we docked at Honfleur on the Seine near the North Sea. After embarking we picked up a rental car and spent a few days touring Normandy and Brittany, while staying at some incredible hotels and eating and drinking far too well. In one hotel, Marg wished the barman "boa noche" (good night in Portuguese) and he responded. It turns out he was Brazilian, married to French girl.

A.14 Cruise around Iceland, trip to Greenland - 2010

In 2010, the University of Toronto Alumni Association offered a cruise around the western end of Iceland. The trip avoided the eastern end of Iceland because of 2010 eruptions of the Eyjafjallajkull

volcano, which caused disruptions in air travel across Europe.

We flew to Reykjavik and spent time touring the capital. From there we boarded our ship, again from the PONANT cruise line. We visited several sites around the West end of Iceland including being on a island that straddled the Arctic Circle. Here we saw incredible numbers of Auks. Once the cruise was over, we returned to Reykjavik and flew to a small town in Greenland, where we spent a few days just absorbing the culture and the scenery.

From Greenland we returned to Reykjavik, and then flew home to Canada.

A.15 New Zealand - 2011

In 2011, Marg and I decided to take a personally conducted tour to New Zealand, a country that Marg always wanted to visit. We flew to Auckland through Vancouver on March 1, 2011, where we spent a few days touring the city of Auckland. Unfortunately, on March 5th shortly after we arrived, our dear friend Dorothy Dunkley died from complications from Parkinsons disease. We did not return to Canada for the funeral, but our family was in full attendance.[2] Dorothy had taught our kids to ski and was a mentor to Marg, when it came to cross-country skiing.

From Auckland we flew to Queenstown in the South Island where we picked up a rental car. Originally we had planned to go to Christchurch, but they had a major earthquake on February 22, 2011 and the city was a disaster site. We planned to travel to Milford Sound by plane for a tour. Unfortunately, the weather turned bad and the trip was cancelled.

After a short stay in Queenstown, we drove to Wanaka, where we met up with John and Charlotte Holmes.[3] After a visit in Wanaka, we headed further south covering the southwest of the south island including a visit to the foot of Fox Glacier and a helicopter trip and walk on the glaciers of Mount Cook. We also took a tour of the fjords of the South Island.

From the South Island we crossed by ferry to Wellington. We did not stop in Wellington, but moved on to Rotoura, the Maori area. After an visit there including the hot springs, we moved on to the Auckland airport, where we flew home through Vancouver.

A.16 Arctic Cruise, Northwest Passage - 2011

Another UT alumni trip going from Kugluktuk (Coppermine) in the Canadian Northwest Territories to Iqualit on Baffin Island. Marg and I flew to Edmonton to meet our crew members. While there we visited with our old friends, Tony and Sky Capri, whom we had not seen since 1973.[4]

We flew from Edmonton to Kugluktuk where we boarded rubber dinghies and were transferred to our ship. The ship was a Russian research ship, which was used to test sonar gear for detecting submarines, when the Russians weren't renting the ship out to make money. We sailed from Kugluktuk through the Arctic visiting remote communities like Cambridge Bay. We had two guest

[2]Marg and I did attend a scattering of the ashes ceremony at St John the Evangelist Church in Kitchener on Mothers Day 2011.

[3]John and Charlotte were our neighbours living around the corner at 208 Mohawk. They spent the summer in Waterloo and the winter in Wanaka. They have since moved to Thornbury for the summer. We have known John, since he was a boy and he is a personal friend our son John

[4]Skaidrite (nee Kveps) was a classmate of Marg's in nursing at Toronto Western Hospital and we had visited back and forth over the years. Tony was a Professor of Physics at the University of Alberta.

Figure A.7
A Polar Bear Swimming Beside the Ship in the Arctic

speakers, one Inuit person, whose name I have lost and Dr. Dave Williams, the Canadian Astronaut, who was the CEO of Southlake hospital in Newmarket.

As well as visiting remote communities, we also took dinghy rides looking at Arctic wildlife. Unfortunately these dinghy rides took a toll on my back and I had to stay on the ship at the halfway point of the trip. Fortunately, one of the passengers was a physiotherapist, who had her acupuncture needles with her and she helped to relieve my pain. However, even though I had to stay on board, I was very fortunate, in that early one morning I spotted a polar bear swimming right beside the ship, about as close as one could get. See Figure A.7.

We finally landed in Iqualit, where we spent a day or so before flying on to Ottawa and then home. The Arctic is an incredible place teeming with life and well worth the visit.

A.17 River Cruise Holland, Driving in Belgium and Luxembourg - 2012

In April 2012 another UT Alumni trip to see the canals of the Netherlands and the tulips in bloom. Remember its April. We went on one of the river cruise ships operated by Amadeus River Cruises. The tulips were incredible, but boy it was chilly. Once the cruise ended we rented a car and drove around Belgium, the Netherlands and Luxembourg. We even stayed at the Auberge Kieviet in Wassenaar in the Netherlands not too far from Schipol airport. We had stayed at the hotel before; but unfortunately the experience was not as good as the hotel had gone from being family-owned to ownership by the Fletcher Hotel Chain.

A.18 Danube River, Prague, Bratislava, Krakow and Warsaw - 2012

Again, Marg and I flew to Budapest to start a trip on the Danube River. We thoroughly enjoyed Budapest; it had changed dramatically since communist times, when we were last there. The people were actually friendly and happy.

We toured the river as far as Passau with an extensive stop in Vienna on the way, which we had visited in the past (1974 and 1979). Marg swore that they had rotated St. Stephen's Cathedral.

At that point we boarded coaches to travel across Eastern Europe. Off we went to Prague in the Czech Republic, Bratislava in the Slovak Republic, followed by Krakow and Warsaw in Poland. The sights were incredible.

A.19 River Cruise, Amsterdam to Vienna - 2014

Marg had really become hooked on river cruises, and so we returned to Europe for a cruise on the Rhine and Danube from Amsterdam to Vienna. We visited many local sites but did not visit Vienna as we had been there several times before. We had booked a private tour to Grinzing, but we both came down with colds and had to cancel at the last minute.

A.20 Alaska Cruise and Rocky Mountaineer - 2015

Another UT Alumni trip was a flight to Juneau Alaska through Seattle, where we again boarded a PONANT ship. We visited various fjords around Alaska including Tracy Arm and cities such as Ketchikan and Petersburg. We made our way down the inside passage to Vancouver. Disembarking in Vancouver, we spent a few days touring.

Then off to the station to board the Rocky Mountaineer, where we travelled through the Rocky Mountains to Banff. We stopped in Kamloops for an overnight stay. The sights were incredible and the food was delicious and overwhelming. At the end we stayed at the Banff Springs hotel last visited in 1966. From Banff, we travelled to Calgary airport by bus, where we boarded West Jet for travel directly to Waterloo International Airport.

Appendix B

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