The Education of

Jim Wallis
Cover photograph (l to r) Dad, Mum, David, Roses, me and dog Rex
Underhill Avenue, Pinner, December 1938
The Education of Jim Wallis
Jim
To Lois,
who accepted me as I am
The Education Of Jim Wallis
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David and my father at our summer home on a Laurentian lake outside Montreal
Relatively Eccentric

I was born in 1928 on Bishop’s Street in Westmount, Montreal, a sort of English ghetto surrounded by French Canadians. I don’t remember much about Canada in those days, but I do recall that it was a family tradition to have roast chicken for Sunday dinner at our summer home on a lake in the Laurentian Mountains. My job in connection with this ritual was to drive with my mother to a local farm, where I proceeded to chase chickens until I caught one. The farmer chopped off its head with an axe, then I watched as the body ran around, blood squirting everywhere. When the bird finally fell over, I picked up the corpse, took it back to the farmer, he’d clean and pluck it and we would take it home for dinner. I was not yet five years old.

Later, when we were living in England, I stopped eating meat, and it occurred to me recently that there might be a connection.

My father was a stockbroker in Montreal, doing very well, when the Crash of ’29 changed our lives. There are questions that a child does not ask, as a result of which much of what happened then in our family remains a mystery. I do know that I arrived in England just a few years before a great many English children were evacuated to Canada to escape the war.

Remembering My Father

My father, Ferdinand Howship Wallis, was a major player in my life. I felt—and feel now—very close to him. Mentally and physically the strongest, kindest
The two-volume set of Lyell’s “Principles of Geology,” 10th edition, was presented to my grandfather in 1870. The book was famous for its popularization of the concept of “uniformitarianism.” Robert Fitzroy, captain of the HMS Beagle, presented Charles Darwin with Volume One of the book, which had been published just before they set out on their famous voyage. At St. Jago, Jamaica, their first stop, Darwin found rock formations which, “seen through Lyell’s eyes,” gave him a revolutionary insight into the geological history of the island, an insight which he was to apply throughout his travels.

My grandfather’s books, bound in sealskin, were badly damaged during the war, but were later restored.
and most honest person I have ever known, he was a stable, quiet influence in my life. He was also a stoic in that he never mentioned any of the unpleasant or gruesome details of his earlier life, in particular the First World War.

My father was much beloved by the troops, who called him ‘Uncle Dick.’ A soldier, Aubrey Smith, told of his first encounter with my father in the trenches in his book, “Four Years on the Western Front.”

After a short halt, he wrote, “we resumed our tramp, endeavouring to keep our “fours” as well as we could. It was here that I first saw the kindly face of Lieut. Wallis, ultimately Lieut. Col. Wallis, of our battalion, who had evidently been attached to “D” Company. Whereas most of us looked haggard, unkempt and far from merry, his face was wreathed with encouraging smiles as he walked first with one, then with another, not saying very much, but heartening everyone up with his presence.

When my father was far too young, he ran away to join the army, with the intention of becoming a drummer boy in the 1899-1902 Boer War. His parents forced him to return, but as soon as he came of age my father joined the London Rifle Brigade, although he never did make it to South Africa. It is my understanding that he never wanted to be anything other than a soldier.

Pictures in the family album show me wearing my father’s regimental dress hat with its upright green feathers. The hat was destroyed by a bomb in World War II.

At the beginning of World War I, my father was the Regimental Sergeant Major for the London Rifle Brigade. About six feet tall and enormously strong, he was in charge of all calisthenics and training for the regiment. We have all sorts of wonderful cartoons from the regimental newspaper depicting slaves building the pyramids,
(left) My father (on the viewer’s right) in 1914, before the First World War, with the London Rifle Brigade boxing team.

(below) My father during the First World War
dragging rocks in front of the slave master—my father. My mother told me that my
dad had a 48” chest and a 24” waist when they married.

My father, who was incredibly courageous, was awarded three Military Crosses
for bravery. At some point during the war he was made an acting Brigadier. The
Regimental History also shows him to have served as the Regimental Adjutant on
several occasions. He was invalided out of the service in 1919 as a Lt. Colonel.

The Supplement to the London Gazette, 25 August 1916, cites the award of a
Military Cross to my father for his gallantry:

2nd Lt. (temp. Capt.) Ferdinand Howship Wallis, Lond.
For conspicuous gallantry during operations. He went out alone immediately after
dark, and under considerable fire brought in, unaided, one wounded officer and fourteen
men of other ranks.

A second citation for my father, dated 26 September 1917, reads as follows:
For conspicuous gallantry and devotion to duty. During the preparations for an attack,
he was wounded by a shell, which also severely wounded his commanding officer. Although
unable to walk without assistance, he took command of the battalion and led it to its
assembly position. He commanded the battalion most ably throughout the following day,
and his fortitude was a very fine example to all ranks.

A third citation appeared in the London Gazette, 10 December 1919:
Capt. (A./Maj.) Ferdinand Howship Wallis, M.C., 1/5th bn., Lond.
In the operations near Sebourg and Angreau, he, by his gallantry and resource, was
of the greatest help. On 5th November, 1918, he went forward, and sent back a valuable
My grandmother Wallis holding my sister Roses, with my brother David in the front. My father is standing behind her chair to hide the fact that he has only one leg. The picture was taken in my grandmother’s garden in Golders Green.
report on the situation, and helped to reorganise the forward companies under heavy fire. It was largely due to his work that the battalion was able to hold the village, though both its flanks were exposed.

I found my father’s hand-written diary from the First World War at the War Records Museum in London. The handwriting was immaculate, each page of foolscap written in pen and ink, with not a single word crossed out. There were entries for every day over four years, each comment absolutely to the point. I can remember my father telling me that no one was to read that diary for fifty years because it was so uncomplimentary of the generals and their strategy. Dad spent all of 1919 in hospital recovering from a leg wound and the effects of mustard and phosgene gas attacks. He contracted gangrene, followed by a series of operations to stem the infection. When they finished, there was such a tiny stump of leg remaining that he couldn’t wear a prosthesis. Dad used crutches for the remainder of his life.

While my father was recuperating in hospital, he was asked by the commanding officer, Colonel Bates, to write the official history of the London Rifle Brigade for the 1914-1918 period. I would take a guess that about eighty percent of the official Brigade history of World War I is made up of direct excerpts from my father’s diary. None of the wonderful asides, analyses and opinions that characterized my father’s diaries appear in that official history, which is a dry account of events. He was a wonderful writer, always overly modest about mentioning himself or his leadership. For example, the official history, as my father wrote it, refers to him has having been only “slightly wounded,” a bit of an understatement for someone who spent all of 1919 recuperating from war injuries.
On January 4, 2008, a copy of my father’s diary arrived from the Imperial War Museum. Above is an excerpt describing “Maginn’s end,” at the hands of the Sinn Feiners in a street fight in Dublin. It was wonderful to see my father’s handwriting again. The stack of unnumbered foolscap pages measured about two inches high. The original packaging was destroyed in transit and this page was crumpled.
After the First World War my father became a stockbroker, and he and my mother emigrated to Montreal with my brother David. In an effort to improve his memory, my father studied Pelmanism, a popular memory training technique of the day. He had a wonderful parlor trick where he would shuffle a deck of cards, turn them over one at a time, pick them up, have someone cut the deck, turn over the top card, then correctly call the other fifty-one cards in order as they were turned face up. Because he had total recall of stocks, prices and past transactions, and because he engendered trust through his unfailing honesty, my father did very well as a broker in the Roaring Twenties.

My mother always said that when the market crashed, my father was so busy trying to save his clients’ money that he forgot to save his own.

My family returned to England in 1933, where my father worked in the City of London as a stockbroker. He was gone from home during the week, but I spent time with him every chance I had. We all ate Sunday breakfast together, following which my mother would ask who was going to church with her. In the same breath, my father would ask who was going to help him clean out the goldfish pond and my hand would shoot up.

My other weekend job was to pull out garden weeds, which my father stoked into the incinerator. One of our maids had been fired for stealing, and one Sunday, while we were cleaning the pond, she showed up with her boyfriend. The boyfriend stood there, frantically mouthing off, while I went on pulling weeds and my father went on stoking them into the incinerator. Throughout the entire episode, my father never said a word. He never even looked up. Eventually, they left.

My father taught me to play chess and he loved opera, with which he used to
With my friend Vernon Drewitt and my dog Rex around our goldfish pond before the bombs started to fall. The picture was taken by Vernon’s mother Cecilia.
deafen the entire neighborhood. I do not remember my father ever giving me advice on anything. My Aunt Honor’s husband, Uncle J, was the opposite. He talked to me about all kinds of different things, and the people he’d known.

My mother and father seemed to have nothing in common, and I never saw any sign of affection between them. During that time, and especially among the British, it didn’t do to be demonstrative, and it may be that my parents were affectionate before I was old enough to notice or understand.

My mother, Gertrude, Ethel, Vera, Money Wallis, who was known as “Jean” to her friends,—and referred to in later years by children as the “Duchess of Hoo-Ha”—was not naturally maternal. The story goes that at one point, when I was a baby, she became so frustrated that she sent me flying across the room, where I bounced off the far wall. She used to say that she thought to herself, as I was sailing through the air, that she probably shouldn’t have done that. She wasn’t close to any of us as children.

Our mother always seemed to be living in some make-believe world. In the author’s note on the back of one of my brother’s books, my mother is described as an actress, and that is certainly how she thought of herself. She always wanted to be on the stage. Mother was cut out to be very social, and entertained lavishly when my father was making a lot of money in Canada. I don’t think she ever recovered from the loss of all their money, reputedly about $6 million. I suspect that my family left Canada because my mother couldn’t face the decline in her social standing.

My brother David, who was born in London in 1917, was ten years older than I. He became estranged from my father before the start of the Second World War, in part because my brother espoused Communism and my father couldn’t abide
My brother with my sister and Rex, taken just before David left for Egypt
that. In spite of the fact that he lived apart from the family, David took me to visit London’s museums and galleries before the war. He was an instructive, intelligent, passionate tour guide, and a friendly, useful brother, although we were very different. Where he was introverted and quiet, with a wonderful, dry, British humor, I was big bang-crash, always go ahead, with never a thought of getting hurt.

David married Cecily, went straight into the Army Signal Corps in 1939 and was stationed for six years in Cairo, where he ran the switchboard and electronics at British headquarters. Such an assignment was probably not at all my father’s idea of being in a war, and may have been the cause of some disappointment. Just before I left for Canada in 1946, my brother told me that he had become disillusioned with Communism, and that he and my father had patched up their differences before Dad died. He also told me that he had known our father was dying, and had applied for compassionate leave. His request was denied.

My sister Roses, three years my senior, was at home in the years leading up to the war. We enjoyed one another’s company, but she had her own activities. The Irish cook Betty and I spent a lot of time together, and then there were weekends with my father. The rest of the time I was off on my bicycle to play with my school chums.

Between her arrival in England in 1933 and joining the WAAF in 1939, my mother went back to Canada summers. I have no first-hand knowledge of what she did there or who she stayed with. She was in Canada when I fell out of a tree and broke both arms: in her absence, no one bothered to have my bones set. When my mother eventually came back, both my arms had set themselves at weird angles. She took me to the hospital, where they had to knock me out, break my arms again and reset the bones.

One day my mother proclaimed that she was joining the WAAF—the Women’s
My dear James,

Bartley, I have been in London for 3 days, trying to get another job. I do not think I shall be at Boreleigh much longer. By the way, did you ever get the other case? I sent it off about a week before you broke up. If you did not, I should ask Ollisam to send it on to you. Bartley, I got an envelope from you last letter inside was to Auntie and. Perhaps she got mine. Rex is well but a bit savage. Rais is doing wonderfully well. He has been recommended for a commission. She simply loves being in the W.A.A.F’s. I do hope you will have a lovely birthday to catch some fish. We got the fish today. I wonder if you would like to come and spend a day in London. I cannot arrange for you to sleep here—things have changed so. Everybody has left, including I Brento. It is no longer a nice place.
(above) A picture of my father, taken, I believe, by the famous Armenian photographer Yousuf Karsh. Montreal, 1926

(left) The first page of a letter from my father
Mother and Sis broadcasting to Canada during the war
Auxiliary Airforce—and went off with my sister Roses to sign up. When they
wouldn’t take Roses because she was underage, my mother said goodbye, leaving my
sister to fend for herself. That was very much like my mother. She and my sister were
on the radio together, and we have a photograph of them broadcasting to Canada on
CBC radio as “mother and daughter serving together.”

I rarely saw my father after the Blitz started. Dad slept during the day at our
house in Pinner; at night he went out to manage the emergency hospitals. Sometimes
I rode my bike over and he and I would play chess or work together on the stamp
collection until the sirens sounded. I often took our terrier Rex for his nightly walk
down to the corner pub, where we watched them load the anti-aircraft gun, its long
barrel sticking up over the sandbags. The gun would blast off, and, of course, every-
thing that had gone up came down in ten thousand pieces. As Rex and I walked home,
the shrapnel hitting the tile roofs around us gave off a sound very much like Chinese
wind chimes. I had a shrapnel collection, and I remember burning myself when I picked
up a piece that was still hot.

One day, I rode my bike over to school, only to find that it was no longer there.
The occupants, including me, were quickly evacuated to a large vacant country house
in Shropshire, a little north and west of Shrewsbury. Throughout all this, I felt no
fear. I was totally fatalistic. I was also very independent. From the time I was about
eleven, I was making my own decisions about my life.

My mother, who was demobilized before the end of the war, bought a house in
Littlehampton in 1944. One day I was gardening in the backyard, when there was a big
crash. I made a bee-line over to the great plume of smoke, arriving in advance of the
fire department. When the fire brigade arrived, a fireman handed me the end of a hose,
warning me to hold on tight or it would blow both of us away. One of the bombs had
With a friend at the Whipsnade Zoo. I am on the right, wearing the Knoll School blazer. (Knoll was my first school.)
fallen in the shipyard, and they were worried that if the fire reached the drums of paint they would explode. It took us more than two hours to subdue the blaze, and when I left, sopping wet and covered in soot, people crowded around, asking me questions.

Unfortunately, our dog didn’t fare well, and my dad had to put him down when Rex became psychotic under the stress of incessant air raids. Dad was moved to Coventry to oversee a large camp of Irish fellows whose job it was to look for bodies among the ruins and clean up the mess. I went to Coventry once, between the second and third raids, and stayed with my father for three or four days. While I was there, his assistant told me stories about my father that typified the things he had done and the respect he generated from those around him.

One of those stories involved the mess hall. There was little or no meat of any kind available during the war, but the cook managed to acquire some brawn, an English delicacy made from flakes of some unidentified meat congealed in aspic. The cook served thick slices of this, his assistants added potatoes and vegetables and, at the end of the line, the last server poured hot gravy over everything. By the time the men reached their tables the aspic had dissolved; what had once looked like meat had melted and disappeared. A riot erupted in the dining hall.

My dad, hearing the uproar, came from his office and stood, supported by his crutches, in the dining room doorway. As soon as the men noticed him, a hush spread through the group and they settled down. The story impressed me at the time, and I tell it now because I have never met anyone else with such a commanding personality.

I have three letters written to me by my father during the war. I was in Shropshire at school in 1943 when my father wrote to me from Scotland. With the Blitz pretty much over, he had gone to Glasgow to manage a hostel for Merchant Seamen. When they discovered cancer, he went into Prestwick Hospital. His last letter to me was
A second letter from Dad, written on May 2, 1943, while he was running a hostel for Merchant Seamen in Glasgow. I had managed to stay there with him for a few days, but did not detect that he was ill except for the persistent cough that had plagued him for years. In spite of the fact that he was out of hospital and claimed to be improving, he died three months after this letter was written. The doctor told me later that he had never seen anyone with such a strong will to live as my father.
My dear Jim,

You will be glad to know that I left hospital last Thursday after being very, very ill for 5 or 6 months. Now I am fit and well, and presently will be as strong as ever.

You will be back at school when this reaches you, and I hope you will have a happy term. I was very pleased with your last report. Have you got your P.O. savings book? If so, please send it to me so that I can put a bit more in now and again. I want to put some money in every month for you to spend in the future. Have you had any fishing yet and do you want any kind of tackle, or even a fishing basket, more flies, floats or lines? Let me know.

I will be so glad to see you again. This rotten war has certainly smashed up our home for the duration, but presently we will all be together again.

I can feel his loneliness when he refers to the time when the war will be over and we can all be together again. He died three months later in a hospital in Scotland. My father coughed continuously from the gassing he had endured during the First World War. When he eventually died of lung cancer, my headmaster broke the news. I certainly loved and admired my father very much.
My father in 1943, the year he died. In this photograph, taken at the hospital during his last days, you can see his wonderful face and his beautifully kind expression.
Best love
your loving old Dad
The Money family seat: Home House at Much Marcle, nr. Ledbury, Herefordshire
A Mixed Bag

My mother’s family, the Moneys of Home House, Much Marcle, was, and still is, a well-known component of the British upper-middle class. Unfortunately, our branch, which did not come down through the chain of first-born sons, was not extraordinarily wealthy. From the 1881 census, we learn that the following persons were living at Much Marcle: John Earl Money, head (my great-grandfather) and his second wife, Ada F. Money; four daughters, ranging in age from two months to thirty-two years (from John’s two wives); three grandchildren; and thirteen servants, not counting daily workers. The grown sons had left home.

My grandfather on the Money side was a mining engineer. He and my grandmother moved to Canada, but returned to England when a mining explosion left him blind in one eye and badly burned. They went on to have seven boys and six girls, of whom my mother was one. My grandfather died in 1933, before we returned to England, so I never met him, but I remember summer visits to Grandmother Money’s house Windy Croft, on the Isle of Wight. Every inch of the walls at Windy Croft were filled with Zulu spears, shields, Bird of Paradise feathers and other trophies from the wars and travels of the six eldest sons, my uncles. I have a painting that one of my uncles brought back from Japan before the First World War. The rest were lost.

My mother was very loose about who was a relative and who wasn’t. According to her, the actor Nigel Bruce was an “uncle,” and she took me up to the British film studios to meet him. She introduced him to me as Uncle Nigel, and he seemed to accept it. My Great Aunt Ess, a descendant of one of my Grandmother Money’s brothers or sisters, was another such “relative.” She lived alone in a giant house with six staircases near Guildford, where Roses and I loved to play hide and seek. There
(l to r) Trevor van Stockum, Grandmother Money, Una and Una’s second husband, an American named Artie
Cranleigh, April, 1943
were an infinite number of places to hide. The religious cult that Aunt Ess belonged to believed that the end of the world was coming on a certain day: they were so certain about this that they didn’t provide for apostolic succession. The ministers all died, the date came and went, the end of the world wasn’t upon them and Aunt Ess was living alone in the house that she had left to the church. By the time she died the church was no more and her estate was taken over by the government.

Of the thirteen children in my mother’s family, twelve survived to adulthood. All the boys, with the exception of Anton (Tony), the youngest of the sons, were killed in the First World War. I never met Tony because he took off right after the war and went to the Yukon, where he was involved in a gold strike. Tony wrote a book called “This is the North,” and it was pretty interesting reading. The family thought it impossible that Tony had done all the things he claimed to have done, but having been in the North Woods, I believe it completely.

My mother’s eldest sister Honor, my favorite aunt, went to finishing school in Paris. Her husband, Uncle J, served at one time as the Governor of Kenya. When their daughter Patricia was diagnosed with a congenital disease that prevented her from developing properly after age thirteen, the doctors in Kenya were at a loss and suggested that specialists in London might know what to do for her. As a consequence, Uncle J retired early and returned to England with Auntie Honor and Patricia. I saw him every weekend I could—and that was quite often before the war—at his wonderful old country house just outside Horsham. He didn’t have any sons, so he took a special interest in me. “J” taught me to play poker, a skill that later paid my way through university. He would bet and gamble on anything, and gladly took my money if he could. He was always offering me bets; it was up to me to learn to separate the sucker bets from the ones where I stood a chance of winning.
Auntie Honor (left) and my mother (right)
The woman in the middle is Lady Rosemary Esmond, my sister’s godmother.
Uncle J was a major influence in my life. He was sober, but he had a very warm persona and a wonderful sense of humor. People were always attracted to him. I found him to be extremely kind, very interesting and, importantly for me, he would discuss absolutely anything. Uncle J cultivated forty-five different kinds of apple trees, from which I would help pick fruit to be stored up for the winter. That was one of my tasks on the estate.

My mother’s youngest sister Molly, whom I always considered to be incredibly stupid, married Owen Jones, a member of the British Repertory Theatre. During the war, Uncle J held weekend parties to which Owen and other actors involved in making patriotic movies would come. Copious amounts of booze appeared from the extensive wine cellar my uncle had laid in before the war. This fascinating group of people, including the likes of David Niven and Stewart Granger, played poker or roulette, and sometimes both. I was allowed to play poker with the adults, but at roulette my uncle gave me the option of playing or helping him run the game for a share of the “house” profits. It didn’t take me long to learn that backing the house was more lucrative than playing.

Uncle Owen eventually joined the Air Force and was killed during the war.

Aunt Una, who was just a bit younger than my mother and something of a sexy beast, had three husbands, all of whom were killed in one way or another. Una and her first husband, a Dutchman named van Stockum, had two sons, my cousins Trevor and Jim. I spent a lot of time during school vacations with Trevor, who was a year older than I was, at his house in Cranleigh. Trevor had taken a Charles Atlas course to build his body, and at age fifteen he joined Holland’s Princess Irene Brigade. A year later he landed in Normandy with the troops on D-Day plus one. As a Lance Corporal in charge of an armored-car reconnaissance unit, Trevor drove the first Allied vehicle into Holland. He survived the war to become an insurance agent.
A photograph of my mother taken in the early 1930s
Trevor’s brother Jim van Stockum, a gunner in an RAF bomber squadron, completed three tours over Germany, following which he was grounded and transferred to training and recruiting. At a time when fifty percent or more of the fliers were shot down on every raid, the odds against surviving three tours, each of which comprised twenty-five flights over Germany, were dire.

A Bit of Doom and Gloom

With our house and my school destroyed in the Blitz and my mother, my father, my sister and my brother all in the service, I was evacuated to Shropshire with my grade school. I found myself in a country house without any food to speak of. Rations included something like one egg, eight ounces of meat and a pound of jam or a pound of sugar a month. John Greenwood, my friend and fellow student, was evacuated with me from London, and together we took to poaching rabbits from neighboring estates. John and I would go out at four in the morning to inspect some fifty traps, and still manage to return to school by daybreak. We killed and cleaned an average of six to twelve rabbits a day, and that more or less kept the school ticking over.

I remember the headmaster, known behind his back as “Beanie,” telling us that he had received complaints from local landlords. The magistrate had called and could we please “ease up a little.” Beanie also acknowledged that nothing serious was going to happen because we were basically keeping the school going, but we did have to lie low for a while.

Ultimately, I became a student at a sound but minor public school called Ellesmere, one of the Woodard schools, the best known of which is Cranleigh. Ellesmere was
Age ten years
housed in a beautiful building with a wonderful approach. The chapel featured a famous organ that attracted a number of great Welsh singers.

My grade-school headmaster had been at Cambridge with the headmaster of Ellesmere, and I remember standing there while the two of them discussed me.

“He’ll have to take the entrance exam,” the head of Ellesmere insisted. My grade school headmaster replied that there was absolutely no point in that since I wouldn’t pass and it would just make me feel badly. Ellesmere took me anyway. During my first year there I remained at the bottom of my class. I didn’t pass anything until the final exams. My report cards inevitably read “could do better” or “very lethargic.” I had to go to the dictionary to find out what lethargic meant.

That was in the days of track systems: they had a college track, a “B” track and then a sort of “C” track, which was basically basket-weaving for the absolutely incorrigible. Oddly, in spite of my poor grades and discouraging reports, they always kept me in the college track. I never did figure out why.

Winters were colder then, with lots of snow and ice. I had chilblains on my chilblains. I went through the ice on the reservoir near the school in Shropshire, but luckily managed to swim to the grilled spillway. John Greenwood helped me climb out and made me run all the way back.

I worked on local farms under the Lend-a-Hand-on-the-Land program, and became quite a good farm laborer. I started out at the student rate, but soon the farmers began to request me by name and paid me the adult male rate. It wasn’t much, but it bought a lot of beer and cider. I was never very good at organized sports, with the exception of long-distance running and swimming. The only rule I can remember from inter-house water polo was that you couldn’t hold someone under
The approach to Ellesmere
water beyond the point where artificial respiration was required to revive them.

There were some incredibly bright kids at Ellesmere, and they were all my friends. Among other things, we played chess together. One student named Henderson won an award to enter Cambridge at an exceptionally early age, but stayed on at Ellesmere two additional years because the masters didn’t think someone so young would be socially comfortable at university.

Not infrequently I was kicked out of class for doing crazy things. At the end of our music appreciation class the teacher gave an exam, which consisted of him putting on a record, dropping the needle somewhere in the middle, playing two bars, then pointing to someone to identify the piece. Because I was clearly the most incorrigible and least musically-talented person in the class, he gave me the easiest one, “The Hall of the Mountain King,” which no one can miss. When he pointed to me, I identified the tune as the “Teddy Bears’ Picnic,” and was promptly thrown out. That piece of mischief was one of my favorites.

I was sent out of art class when I dropped aluminum sulfide into a water dish and everyone had to be evacuated.

You had to work like hell at Ellesmere, by the way. The younger students had three hours of study hall every night in the main hall; older students were entrusted to go off to one of the little classrooms on their own, where a master would look in once or twice to make sure we were studying. Sometimes we played poker instead, using chips and cards we had stored in a big file box in the chemistry lab. The Master didn’t worry us because we could hear his footsteps from a long way off.

One night we decided to get some ether out of the chem lab and take sniffs. Of course, you get pretty groggy doing this, and eventually one of the Gemmel brothers took an overdose, fell off the stool, vomited and passed out. We were all trying to revive
An Ellesmere Meynell House class picture. My English Master and House Master, Mr. Feist, is center. To his left is my friend John Greenwood. I am second row, third from left.
him when the Master came in. We explained that Gemmel had been taken ill.

We carried Gemmel down to the infirmary, where the nurse decided that whatever he had might be infectious, so they kept him in the isolation ward on bread and water for three days. Oddly, there were no further repercussions.

My last year at Ellesmere, we were assigned a math teacher who had just come out of the RAF. He told us that navigators completed a four-year course in high-school mathematics in three months: we had an entire year to learn the same material, he said, so this would be a piece of cake. He then went to the blackboard and started with $2+2=4$; by Christmas, I was extremely competent in mathematics.

Every week for the four years I was at Ellesmere, our English Master (and my House Master) Mr. Feist, had us choose from six different subjects as the basis for a three-page essay. We weren’t allowed a single grammatical or spelling error. On one occasion, the subject I chose was an eclipse. I had read “King Solomon’s Mines,” which has an eclipse scene where everyone panics, and I wrote this up as my essay. The teacher asked me if I had read the book and I said I had, about three years before. Mr. Feist really taught me how to write.

The “A” track required two languages, so when they suggested that I drop Latin on the grounds that I was “incorrigible,” I replaced Latin with German and added that to French. Our teacher, who was violently opposed to his students learning German by memorizing complete sentences, gave us only one phrase to commit to memory. That phrase translated out as, “I long for a glitzy blonde with lipstick and a flashy two-seater.” That’s the only German I can remember.

Instead of a high-school graduation exam, we took the joint school board entrance exam for Oxford and Cambridge, set and administered by the universities. This involved three two-hour math exams. The math teacher had run us through a lot of
Me, my mother and the electrician taken in the backyard of the house in Littlehampton, near Brighton. My mother bought that house, which the Army had left in a total ruin, in 1944, after my father died.
calculus, so my friends and I competed to see who would be the first to finish and walk out. Gemmel IV won because he was out in twenty minutes, but we all scored a hundred. The grades were even more staggering when you consider the exam was graded against the whole of England. Our school was at the very top of the curve. I must have received a good education because I had been at the University of New Brunswick for two years before I encountered anything new in chemistry, physics or math.

My last Ellesmere report was filled with the usual gloom and doom about how useless I was. The only ray of sunshine was Mr. Feist’s remark: “He can do quite well if he wants, I just have no idea if he wants.”

One of my two acting experiences occurred during my last year of high school, when we produced a Shakespeare play in which the king gives a rousing speech before exiting off stage. The abbot—me—who has been standing in the background, then walks to the center of the stage and delivers a few lines. I don’t remember what the lines were, but it doesn’t matter. They needed a gaunt figure, and I fit the bill: at six feet tall I weighed one hundred twenty-eight pounds. I spoke my lines, but no one heard them over the thunderous applause following the king’s speech.

I returned to Ellesmere as a prefect in the fall because I didn’t have anything better to do or anywhere to go. My father had died, and my sister and brother were still in the service.

Dreaming of Trees

I was about twelve when I announced to my family that I wanted to be a forester. One of my grandfathers had been a surgeon, and the other a mining engineer. My father was a soldier and a stockbroker, so no one in the immediate family had any connection
My sister Roses and me, Guildford, April 1945
RELATIVELY ECCENTRIC

to forestry or to being a forester, or even knew what one was. They thought I was crazy, but there were a lot of crazy people in my family so no one noticed.

I think the idea must have come from Uncle J. He said to me once that he thought the foresters in Kenya had the best job of all, and that’s the only thing I can think of. Maybe his comment piqued my interest.

During my last year of high school I realized that I needed to go to university if I wanted to be a forester, and to do that I would have to pass an entrance exam. My father had a photographic memory, and I was able to memorize everything I needed whenever I really needed it, so perhaps it is genetic. I do remember that I studied extremely hard and passed the exam. In fact, I did quite well.

The war was over when I applied to college in September 1945. At the time, only three schools in England offered forestry courses, and not one of them welcomed my application. The line given me was that all the places were to be allocated to returning servicemen, and that I should wait another year.

I might have waited more patiently if I hadn’t been drafted into the English Army. Soldiers were required to ensure the safety of the Palestine protectorate against the Haganah, a Jewish terrorist organization determined to form the State of Israel. The terror campaign gathered steam in 1945 and 1946, and the British Army was trying to maintain order. I decided I really didn’t want to be part of that. The idea of going to the Middle East to fight terrorists just didn’t appeal.

The British couldn’t draft me because I had been born in Canada, but that situation changed if I stayed in England another year. Around that time I met a Canadian woman in a pub in Littlehampton and she happened to know the president of the University of New Brunswick. She mentioned that UNB had a forestry school and suggested I write to the president and mention her name. I did, and was accepted.
My brother David, and the cover of his first book. He eventually wrote four published novels, as well as numerous articles and commentaries. He sold film rights for all except the first one, “Tram Stop by the Nile,” but none of them made it into the movies. After the war, David taught English in French schools and French in English schools.
The problem was that there were no planes or boats available to carry me across the Atlantic to UNB, so for thirteen months I was on twenty-four hour notice for a passenger spot. In the meantime, I accepted a position with the British Forestry Commission pulling over six-hundred-year-old oak trees in order to start the Alice Holt seedling nursery. This work was accomplished by hand, with the aid of come-along winches. The Forestry Commission constituted my first real job.

For those ten months I lived in a farm cottage in Surrey, near what is now the Alice Holt Experimental Station. I earned thirty shillings a week, which paid for my room and board with enough left over for weekends, when I might go down to see my family or buy a beer at the pub.

Word finally came that I was to go to Liverpool and join a mini-aircraft carrier being used to ferry food from Canada to Europe. The guns had been stripped off, and the thirteen pilot cabins were now available for passengers. I was told to report to the dock within twenty-four hours.

Just before I sailed for Canada, three men from my father’s First World War regiment asked me to join them for an evening. Sitting around a table in a smoky pub in London, they told me stories about my father that made the hair stand up on my neck. One of those stories involved an horrendous trench warfare battle that left a lot of wounded soldiers stranded in no-man’s land. Under heavy machine gun fire, my father ventured into that bleak space and brought back fourteen wounded, one at a time. It took him all night. He was awarded his first Military Cross for this act of bravery.

I didn’t ask whether any of them had been personally involved, but when we parted the men gave me five hundred dollars to see me on my way. That was a huge sum of money to me in 1946.
I am wearing my brother’s suit

Mum and me outside the headmaster’s study, Martin Hall
I sailed from Liverpool late in the evening of September 13, 1946. In the middle of the night we hit the remnants of a hurricane, head-on. In the pitch dark night, I went up onto the flight deck, which had no railings. Giant waves flooded down the deck and I could hear the props spinning out of the water. Had I been washed overboard, no one would have known until the next morning, and they most certainly wouldn’t have turned around to look for me. Eventually it sunk in that I should get the hell out of there and go below.

I was promptly seasick for the next three days. When I finally woke up, I found that one of the passengers had died and was to be buried at sea. The captain read the words, but nobody could hear him above the roar of the wind. When they lifted up the end of the stretcher and slid the body over the side, I remember being surprised at how long it took before we heard the splash.
The rugby team at Ellesmere. I am back row, second from right.
My mother and me on my 18th birthday
My sister knit me a (long) scarf to take to the University of New Brunswick.
Mother and Sis after the war
The inhabitants of Alexander College, Hut 13, March 1947

Larry Presso (with the camera, on the right) had a telephone and a pet rabbit, both rare commodities then. We thought the rabbit might be lonely, so we found another one, dressed them up as bride and groom, and held a shotgun wedding. I am on the extreme left; Jerry Seed is next to me. The ‘priest’ was Bob Clark. Les Snook is holding the ‘bride’; Sherman Scott is holding the ‘groom.’ My friend and study partner Al Smith can be seen (head only) in the doorway, left. He and his wife, Barbara, now live in Ottawa, and we try to stay in touch.
I froze my ears twice in New Brunswick. The first time involved a Chemistry Society dance, when I had to walk a mile along the railroad tracks from the main campus to my residence at Alexander College. When you arrived at the dance, they handed you a beaker filled with fifty percent pure ethyl alcohol and fifty percent Apple Jack. After one or two of those, you were bombed out of your gourd. I walked the mile home without my coat or hat and froze my ears solid.

I lived in Hut 13 at Alexander College, which looked about the way it sounds and was notorious for the misdeeds of many of its inhabitants. I studied with Al Smith and Ken Mosher, both war veterans six or more years older than I was. The huts, remnants of an old Army camp taken over by UNB, were heated by wood-burning stoves, which I stoked at night for 50¢ an hour when I ran out of money. I gave that up when I found I could make a lot more playing poker. It was primitive living, with gray army blankets hung across the openings to serve as doors. We had a lot of drunken parties at UNB, for which we made our own brew. On Mondays, the residence dean came around with an assistant to assess the damages and bill us accordingly.

My first summer at UNB, 1947, I joined the ROTC program and signed up to go to Chiliewack, BC, where the Canadian Army Corps of Engineers trained. My second choice was artillery. They assigned me to artillery, and sent me out to the prairies of Manitoba as an officer trainee cadet. The camp in Manitoba had been an
In my ROTC uniform at UNB
Air Force training base for parachutists during the war, and I remember climbing the parachute tower and taking a picture due west of a whole lot of nothing. Many nights we had violent, long-lasting thunder and lightning displays.

The experience reminds me of the film, “An Officer and a Gentleman.” A drill sergeant was always right in your face, although they couldn’t actually hit you. The drill sergeant absolutely hated me because I was sloppy: my shoes weren’t shined, my buttons weren’t right, my tie was wrong and my bed was never made properly. It didn’t matter what I did, I was always on his shit list. Then they started with the actual artillery and gunnery practice, and I was always the first to finish and I always got it right. The drill sergeant was so surprised that he almost forgave me my other sins.

Two summers spent working in the woods was a condition for graduation from the forestry program at UNB. During my second summer at the University of New Brunswick I worked for the Ontario & Minnesota Lumber Company north of Lake Superior. We left the train at Heron Bay, paddled our canoes up the Black River and set up camp. From there, we leap-frogged up the river toward Hudson Bay, going deeper and deeper into the woods. This was wild country. In the absence of roads, small-scale aerial photographs were the only guidance we had available. We spent the summer setting up and breaking camp as we worked our way steadily northward, cruising the timber as we went. The only sign of a human presence was the occasional portage trail around a rapid or waterfall forged by an unknown Indian or trapper in years gone by.

Our group comprised five two-man crews and a French Canadian cook, all of whom lived in big canvas tents. Every morning we woke to the cook swearing at us
My passport picture, 1945
in French. Nothing but fun because here you are in the North Woods, living in tents, surrounded by wolves and moose and black flies and eagles. Trout and otters populated the rivers; walleyes and northern pike abounded in the lakes. These woods, with its rapids, waterfalls and un-fished lakes, was a spectacularly beautiful place.

Every two weeks or so, we’d pick a lake from the aerial photographs and request the supply plane for a certain day. It was our job to make our way down to the lake ahead of time, select a beach accessible to the plane, then find our way back to camp with the supplies. At eighteen, I thought this was absolutely the most perfect way to spend a summer. I understand they can’t sell those jobs to kids now.

John Perry, my partner and compass man, was a freshman at UNB when I was a sophomore, so I was big time. I was older, I knew more and I could actually cruise timber. Basically we were mapping the area, making an inventory of where the different species of trees grew and how big they were. Johnny kept us on course while I measured the trees, calling out the species and size while he wrote it all down. When we finished in one spot, we moved on another chain length and did it all again. We were carving our way through uncharted territory, creating trails as we went. On one occasion we had to forge a trail up a cliff, requiring me to climb forty or fifty feet up sheer rock. I had my hands flat on the top and pulled myself over the rim of the cliff only to find myself looking directly at the back end of a startled skunk. I lowered myself gently, waited a few minutes, then lifted myself up in time to see him strutting indignantly away, his tail straight up.

The guy in charge allocated a certain amount of work each day. We did it all at a dead run because Johnny wanted to keep in shape for the boxing team, and as a result we were always back in camp by noon, our work completed. Afternoons, we shot spectacular rapids in our wood-and-canvas Chestnut canoes, made in Fredericton, NB.
Me in front of UNB Forestry building. Before I left England, someone gave me a Merchant Seaman’s coat with a huge collar that came up over my ears, and a pair of boots lined with felt. That coat kept me alive in New Brunswick.
By the weekend, I had deduced which rapids you could shoot and live, and proved it to the others by taking a trial run. Because everyone took pictures of me doing this before trying it themselves, most of the exciting photos featured me. In my little red album there is a picture of me going over an eleven-foot waterfall in a sixteen-foot canoe. I nearly drowned in the undertow. You had to hit it absolutely right, and it took me three tries to succeed. No one else tried it.

Of course, we hit a lot of rocks in the process and absolutely wrecked the canoes. We applied patches on patches and made new ribs out of spruce to replace those we’d caved in. I think the canoes weighed about ten tons each by the end of the summer. We also did a huge amount of work and mapped a vast amount of land, more than the company had figured we would.

At the end of the summer, we paddled down the river to Hemlo, portaging the laden canoes. From there it was the train back to school.

My third and last summer at UNB I was hired by John Liersch, a vice-president of the Powell River Company and a former UNB grad, to work as a logger in British Columbia. It is there, based at Port Hardy at the north end of Vancouver Island, that I fell in love with the big trees. On my first day, the crew was moving the “setting,” and there were cables everywhere. The rigger in charge, Ernie Alexander, was continually shouting at me to “get out of the bight.” He kept me alive, and I learned a lot from him.

By that time, my sister had married a Canadian and emigrated to Vancouver. Their belongings had been shipped by freighter in a huge wooden crate, and I proceeded to convert that container into a little cabin for myself at the back of my sister’s lot. When the logging camps closed, I set up shop in this little cabin. I taught her kids to swim and took them for their first haircuts.
My graduation picture, UNB, 1950
Prior to 1950, the normal forestry graduating class had numbered three or so. The first post-war graduating class—my class—was swollen by returning vets, and there weren’t enough jobs for the more than one hundred twenty-eight foresters receiving degrees in 1950. I was one of the nine awarded first class honors. I went for an interview with the Ontario & Minnesota Company when they came to our campus with an unusual offer. They had one job opening for a forester, but they said they would hire twenty graduates in all, at the same pay: the other nineteen would have to do whatever needed doing anywhere in the company until a job opened up in forestry. During the interview, the guy asked me if I had ever worked in the woods before.

“Oh, yes,” I said, “last year I worked as a logger on the West Coast and the year before that I worked for your company.”

“Where?” he asked.

“Oh, up on the Black River, north of Lake Superior.”

Looking straight at me, he said, “I know you. You’re the guy who wrecked six canoes in one summer.”

A mildly unjust statement I thought, but I had to admit that I had had something to do with it. Once he said that, I knew he couldn’t do anything else but offer me a job because I seemed to have become a company legend. I was among the twenty selected, but the problem was that I had fallen in love with the big trees and the process involved in moving them. I wanted to go back to British Columbia, so I didn’t accept his offer.

After graduation I wandered out west, where I contacted John Liersch, the fellow who had previously hired me to work at Port Hardy for the Powell River Company. He told me there were no openings for foresters, but that if I would work as a logger, he would see to it that the superintendent put me into every job that existed in the logging industry. That experience would, he assured me, be very useful when I finally
Northern pike, summer 1947

Fishing in the Nimpkish River, 1953
went into the logging engineering field because I would know what all the equipment could and couldn’t do, and be able to place the roads and landings in the best places.

I started with O’Brien Logging and moved on to other Powell River subsidiaries as I took on the various logging jobs. In those days loggers were primarily Swedes and Norwegians, or people who had been given floaters by the Vancouver police—get out of town, work as a logger or go to jail. They tended to quit logging at the drop of a hat. One day, my roommate Roy Hansen threw his caulk boots up toward the bunkhouse ceiling, announcing that if they stuck to the roof, he would stay. If they didn’t, he would quit. They didn’t; he left.

Because of the huge personnel turnover, I had a chance to try everything. I was a boom man, a high climber, a rigging slinger, a loader and even a gandy dancer when a car went off the track and tore up several miles of the road bed before the engineer noticed. Gandy dancer is a slang term used for early railroad workers who laid and maintained railroad tracks in the years before the work was done by machines.

In those days, we were clear cutting huge stands of old-growth timber. The survey crew (us) came in first to mark where the road or rail center line should be. We were followed by timber fellers and buckers, who dropped the trees and cut the timber into logs. The fellers and buckers were paid on a piece basis, determined by the scaler who came in and measured the volume of the logs. Once the scaler had done his work, the powder monkey blew up the stumps, clearing the way for the bulldozers and shovels to level the road bed.

One day, as the crew and I were walking along the trail created by the fellers, I suddenly realized that it was too quiet, and told the others to get the hell off the right of way. We had just made it up into the trees when the first stump blew behind us. More than sixty stumps in all exploded around us, throwing big chunks against the
One night, when we were surveying for the railway from Nimpkish Lake to Beaver Cove on Queen Charlotte Sound, we were in our tents when I heard a noise and thought that some caribou had come around. I rushed out and ran right into two bears. I woke the Latvian cook, who decided that the bears weren’t going away, and promptly cooked pancakes to divert them. I walked twenty miles to pick up a gun, leaving the cook alone in the camp, scared witless. Above is a picture of our cook making pancakes and (right) feeding them to the bears.
trees where we were sheltering. The powder monkey counts the number of explo-
sions, and when I heard him yell all clear, we walked in. When he saw us coming, he
went white as a sheet. He had forgotten about us.

“Trouble wit’ me, boys,” he explained, “is no edumacation.”

Logging was dangerous work, killing or maiming an average of three people a
year in the camps. While I was working as a logger at O’Brien, the union tried to
organize the camp and elected me president of the local chapter. We compiled a
list of demands, I isolated those I thought were reasonable and within the camp
superintendent’s power to change and the next day he agreed to every sugges-
tion. I had to resign from the union when I was offered a management posi-
tion as logging engineer. I still have my discharge papers from the International
Woodworkers of America.

The bunkhouses were built on sleds, part of the “cut out and get out” philosophy
that prevailed at the time. It rained upward of three hundred inches a year where we
were, and as there was no insulation in the bunkhouse ceilings, most winter morn-
ings we woke to the thunderous roar of rain beating down on the corrugated iron
roofs. About all you could say for it was that we stayed dry. We slept on cots, two cots
to a section, four sections to a bunkhouse, with no doors separating us. The stove in
the middle kept the place warm. There was also a big bathroom and a huge cook-
house. A logger’s breakfast started with four eggs, bacon, ham, sausage and a small
mountain of pancakes swimming in butter and syrup, all washed down with black
coffee, a meal that supplied about six thousand calories.

I had four particular friends from that time. Two of them, Andrew Rucker
and Ray Magdo, were Hungarian refugees who had managed to escape when the
Russians moved into their country. They were known as DPs, Displaced Persons. I
From the Atlantic Coast to the Pacific West, the story of the many and varied railroad operations and the history of Canada are inextricably tied. Perhaps no other form of transport has affected the fortunes and lives of so many Canadians during the last 100 years.

In the scene above, steam locomotive Number 113, a 138 ton. Also built 2-8-2 is seen pulling a train of log cars across the Nanoose Creek trestle in the beautiful Nemehes Valley on Northern Vancouver Island, home of the Englewood Logging Division of Canadian Forest Products Limited.

This operation is the largest logging railroad in Canada and in October of 1974, after the derailment of two modern diesel units, Number 113 made a rare appearance under steam to haul logs between Nemehes Camp and the log dump at Beaver Creek. This gave the veteran engine the distinction of being the last steam locomotive on Vancouver Island to haul timber over a main line logging railroad.

Englewood Logging Railway, 1971
met Andrew and Ray when I was wandering around the bunkhouses one evening and found them playing chess, a rarity among loggers. I am a chess player, so I put them both on my survey crew. We worked for many years together and became fast friends. When I quit, both Andrew and Ray left very shortly thereafter.

Andrew Magdo eventually owned two Ford dealerships in Vancouver, and we stayed in touch. The picture of the bridge on the Englewood Logging Railway, which now hangs on our wall in Vermont, comes from the time that Lois and I visited him. Andrew had an extra copy of the picture, as well as a genuine Nimpkish railway spike converted into a beer can opener and sold in a red cedar box by the Hudson’s Bay Company store in Vancouver. The Canadian Forest Products (now known as CANFORS) Englewood Railway was the last logging railway to operate in the North American continent and, as such, has acquired cult status. The picture shows the trestle bridge, Nimpkish Lake and Pinder Peak in the background. They are all correctly depicted, as is the steam locomotive, which was brought out of retirement briefly in 1971 when both modern diesel units were derailed. The railway is part of the direct rail link between the head of Nimpkish Lake and the Queen Charlotte Strait at Beaver Cove. The bridge had been designed but not yet built by the time I left British Columbia.

Ray Rucker, my other Hungarian friend, moved to Ontario, where he married a very rich widow. They were so rich that it was impossible to find a telephone number or address for them. When I finally located Ray’s son, he was guarded about talking to me. I said that if his father was the Ray Rucker who had worked in the woods in British Columbia, I had some photos to send to him. His son told me to send them to him, so I did. Ray rang me up when he received the pictures, but died shortly thereafter. We never had the chance to renew our friendship.
Ronny Waddell at the drafting table, Nimpkish Survey Office
clockwise from the top: Ray and Andy; Andy; me
A Nimpkish firefighter, wearing my hat in order to remain anonymous
Ronny Waddell, whom I met through a girlfriend at a party in Vancouver, was another good friend. He had more or less recovered from a bout of TB, but his doctor wanted him out of the city, so I found him a drafting job. After I left the logging camp, Ronny went to dental school, returning summers to work in the woods. When Ronny graduated, he went up to Prince Rupert, near the north end of the British Columbian coast, where he worked for years as the town dentist. Those were my three good friends—Ray, Ron and Andy—and we were very close.

When the forest dried out, we responded to the increased fire hazard by going onto an early shift, starting at 3:30 in the morning and finishing at noon. I would spend the rest of the day fishing for sea-run cutthroat, native rainbows, and, in the winter, steelhead and salmon. So many trout fought over the lure, with three or four of them persistently attacking the fly right to my feet, that I often fished with the hook cut off.

Following one very dry summer, we had a big forest fire in the old growth timber above Camp Woss. Blazing trees, three hundred feet high and twelve feet in diameter, shot fiery debris in every direction. Hearing an incredible roar, I walked through the forest to find out what it was. A big red cedar, trees which are generally hollow at the bottom, was sucking air in through the bottom, where it was rotten, creating a huge blast furnace that sent sparks four or five hundred feet into the air.

I was one of ten men—people used to wandering around in the wilderness with a compass, an axe and little else—who were dropped onto the shores of a lake north of the blaze. Our job was to walk over the mountain and down to the Nimpkish River, behind the fire, in an attempt to set up a fire line. It was hard, dirty work, and the only way to clean up was to take a dip in the ice-cold river. You jumped in, let out a shriek and got out as soon as you could. When the fire blew up and swept over our camp, we walked down the river, through the fire, and out to the main camp.
My first love, Carol Wayne
The fellow in charge of the fire camp was a tough old logger named Louis Wayne, who used me as a sort of scout. We did our work without the benefit of walkie-talkies, radios or cell phones. I went around the fire lines and reported back as to where the fire had jumped and where it hadn’t so that Louis could allocate the crews. Scouting was extraordinarily dangerous work, not least because in my spare time I packed gasoline to the pumps, with fire and sparks falling all around.

I became very friendly with Louis and visited him often after the fire. It wasn’t long before I noticed that he had a very pretty daughter named Carol. When I went up to Camp Woss the following week, Louis assumed I had come to play pinochle with him in the kitchen, as we did most evenings, but instead I took his daughter into the living room, where she and I talked. Carol was my first real love.

Eventually, I asked her to marry me, and she said no.

“Why?” I asked.

In her words, she “didn’t want to be dragged all over the world.” Her dream was a little cottage on an island just south of Vancouver. She later married a man from the Canadian Pacific Railroad and had her little cottage. It seems she knew me better than I knew myself.

Some hair-raising things happened to me while I was working in British Columbia, involved in solo, long-range reconnaissance. I was often miles from the nearest road armed with nothing but an axe, something I’m sure isn’t allowed now.

One snowy day, when I was on a solo reconnaissance, I sensed that I was being followed. I turned repeatedly to look back through the forest, but I didn’t see anything. I stopped for lunch, built myself a big fire and toasted my sandwiches, my back resting against a huge Douglas fir as I watched the back trail.
Ronny Waddell’s bachelor party in Vancouver.
(l to r) me, Ron, Andy and Ray
I continued on. By the end of the day, I had left the main river valley and was up on the side hill when I decided to cut diagonally back down to the trail. When I reached the river I found my tracks in the snow, covered almost the whole way back to the truck with cougar prints. I never saw him; I couldn’t hear him; but I knew he was there. You develop an uncanny sixth sense if you’re alone in the woods for long periods of time. I felt much better when I was finally sitting in the cab of the truck with the heater on and the doors shut.

On another solo reconnaissance, looking for the lowest pass through an area that had been logged many years before, I saw an old trestle on the far side of a grassy meadow. Cutting down the slope, I was halfway across the meadow when I heard scratching on my right and noticed two baby black bears scrambling up an aspen. Suddenly, on my left, I heard a series of big huffs. Turning around, I saw Mama Bear bounding toward me at full speed, see-sawing up and down and giving a huff every time her front paws hit the ground. Turning, I ran up the slope as fast as I could; when I reached the top, I cut back about twenty yards. Axe in hand, I jumped onto a big stump, only to see Mama standing on the crest of the hill looking for me. Black bears have notoriously bad eyesight, so I stayed as still as a statue for what seemed like an eternity. Eventually she gave up and went back to coax her cubs down. I gave her a wide berth before proceeding.

I appreciated the solitude. I enjoyed seeing so many wonderful things in places where no one else had been. That sort of experience hardly exists now, except perhaps in parts of South America or Africa. In the course of that experience, I picked up the ability to get along in any culture and to feel at ease wherever I was.

In the middle of this woodsy saga, I went down to earn my Master’s in logging engineering at Oregon State. There is a letter from the logging superintendent to the
Summer of 1949, standing on a “cold deck” with two of my choker setters. These logs have been drawn into one spot and are waiting to be transported six hundred feet through the air to the road. Notice that none of us is wearing a hard hat. I am on the right.
head of the department at Oregon State, saying, in essence, that he was sure they would be very happy with me providing they could arrange a program that fit my needs. His statement should have been a red flag for things to come.

I finished the coursework at Oregon in nine months, then went back to British Columbia to write my Master’s thesis. I was still working for Canadian Forest Products in the Nimpkish Valley. The chief engineer was absolutely useless, and he was also the son of the superintendent in charge of the logging division. I did all the work and he was paid for it, which didn’t sit well with me. It didn’t help that his wife, a very beautiful blonde and a former University of Washington homecoming queen, who really wanted out, went so far as to suggest that she and I elope. After I left, she did just that with my friend Andy. They were very happy, but she died suddenly while still quite young.

I quit the Nimpkish and took my completed thesis down to Oregon State, where my Major professor suggested I have it typed. Defend your thesis, he said, and you’ll be finished in two weeks. That’s exactly what I did. He also mentioned that there were jobs going vacant, and recommended I apply for some of them. The problem was that I was still a visitor from Canada, where I had been born. I didn’t have a work permit for the U.S., but that didn’t stop me from going to the University of Montana, where they were looking for an Assistant Professor to teach surveying and photogrammetry. The latter involves making maps from aerial photographs.
I enjoyed the teaching. It didn’t pay much, but that didn’t really concern me because I was single and I could make more money during a summer as a logging engineer than the University paid me for the other nine months. My first summer at the University of Montana I worked for Malarky & Malarky, a company based in the Willamette Valley. Of course, I loved the company name. Two guys worked for me, and we had use of the company pick-up. Malarky & Malarky paid for everything: motels, meals, laundry. Everything. They paid me three dollars an hour: anything more than an eight-hour day was time and a half, and Saturdays and Sundays were double time. We worked twelve-hour days and weekends, and took Mondays off.

The surveying course I taught at Montana was required of all forestry students. At the time, the University of Montana had a policy that any native son who had attended high school—you didn’t even have to have graduated—could gain entrance to the university. The result was a huge freshman class, most of whom flunked out at the end of the first year. I had been warned that I might find the students in my sophomore surveying class mathematically challenged, and that turned out to be true. I had ninety students in three sections, and the first thing I did was to give them a math exam, and we’re talking about simple algebra and trigonometry. When they had finished the test, I put the answers up on the board, they switched papers, graded them and handed them back.

“Now,” I said, “anyone who scored below such and such a grade, raise your hand.” Most did, at which point I suggested they should drop the course because they were mathematically unprepared and would fail. Of course, none of them dropped out because surveying was a required course. I ended up with a lopsided bimodal distribution: five A’s, a smattering of B’s, C’s, and D’s, and seventy-five fails.
Virgil Miller, my best friend at Oregon State, and me at a bar outside Corvallis. One night we were there after everyone else had left, and the bartender wanted to close up. We wanted more beer. He said the only way we could get more would be to hold him up, so of course I said, “This is a stick-up.” As I pointed my index finger at him, with my thumb over the imaginary revolver hammer, Virgil ran behind the bar, picked up a case of Olympia beer, and we left, driving the back roads in case the bartender called the cops. I guess it all worked out because Virgil and I went back to the bar many times after that. The bartender never asked us to pay for the stolen goods.
This was my first teaching experience, so when it came time to put the grades in I asked the secretary how to do it. She explained that I should take the grades over to the Registrar. On my way over, the Dean’s secretary mentioned that her boss was in and asked if I would like to see him. I poked my nose around the corner and told him that I had the grades from my class, and that I was on my way over to the Registrar.

“Well, as you’re here,” he said, “why don’t I have a look.”

He scanned quickly over the results.

“Not as bad as I expected,” he remarked, so that’s what I turned in.

I went to the Dean of the Math Department and complained that many of the students must have been given courtesy passes in their freshman math course, and that this practice was totally unacceptable as far as I was concerned.

“If they had a legitimate C,” I protested, “these students would have been able to pass my course.”

“As it was,” I went on, “the C students weren’t up to standard, so I should really require a “B” grade.” I added that if a “B” level didn’t do it, I would require my students to have an “A” qualifier, and if that didn’t do it, I would teach them math myself.

The Dean looked at me for a minute.

“That’s the best news I’ve heard in a long time,” he said.

From then on, I didn’t have any of the mathematically ill-prepared in my class, with the result that my students didn’t have any trouble passing my course. Ironically that generated an argument among the students, many of whom believed that I must be softening up because I wasn’t flunking everyone.

At the end of the first year, one of the kids who hadn’t passed my course came to me. He agreed that he had failed all the exams, but he argued that he had done all his field work and thought he had been quite successful at it. Could he repeat the exam,
COPY OF LETTER SENT TO O. S. C. AT TIME OF APPLICATION
FOR GRADUATE WORK

Englewood Logging Division
Nimpkish Office
June 20, 1953

Mr. George H. Barnes
Chairman, School Graduate Committee
Oregon State College
School of Forestry
Corvallis, Oregon

Dear George:

I have your letter concerning Mr. James R. Wallis
who is applying for graduate work in Forest Engineering
at Oregon State College

Mr. Wallis has worked here for something over a
year and one-half and we regard him as a capable and com-
petent field man who will develop into an extremely cap-
able engineer. He discussed this matter with me some time
ago when he applied for leave of absence to take graduate
work. I recommended that he apply to your school for ad-
mission since that I rather felt that Washington would
want him to take the extensive field work of their Engi-
neering courses. This field work is, to a considerable
extent, a duplication of work which he has already done
and he wanted to spend his graduate time on more basic
science and advanced engineering courses rather than on
extensive field work.

I am certain that you will find Mr. Wallis an ex-
tremely able man providing his requirements can be fitted
into your curriculum.

Very truly yours

Russel Mills
Manager
he wondered, and not have to do the field work the next year? I said yes.

That same student came to see me at the beginning of the next year, by which time he had been elected president of the Student Forestry Association. He invited me to their first meeting, which was held in the basement of the Forestry Building. There I was, with two or three hundred students in this huge room, while they introduced the faculty one by one. Each received polite applause. I was last. A student introduced me, and when I stood up there were boos and hisses and catcalls. The noise was deafening, and it seemed to go on forever. Finally I raised both my hands, signaling for quiet. There was a deathly hush.

“My goodness,” I said, “I thought I flunked all you people out last year.”

They roared with laughter and that was the end of it.

Afterwards, we had cookies and tea and mingled around. A professor who had been there for years came up to me.

“That was quite a reception they gave you.”

“Yes,” I answered.

“Well,” he said, “I would have been worried if they had been completely silent.”

After my second year of teaching, I worked for the Bureau of Land Management, first at Coos Bay, Oregon, designing roads in the coast range, and the next summer in their Medford office. Youngblood was my supervisor in Medford, and he was a tough old bastard, but fair. Apparently at some point Syracuse University had a vacancy and asked Youngblood if he knew someone suitable. He wrote a lovely letter extolling my virtues, saying he would hire me permanently in a second if he could, but I was a Canadian citizen, so he couldn’t. He added he was sure Syracuse would find I was wonderful for the job, followed by an aside, “I don’t think Jim can be pushed around much.”
In retrospect, I realize how funny that comment was. It is really not the sort of thing you usually include in a positive recommendation. I never submitted an application to Syracuse, having decided that teaching at an American university without a Ph.D. was a recipe for disaster.

The Bureau of Public Roads was in charge of new road construction. The problem was that while they knew a lot about building freeways, they knew nothing about locating logging roads strategically in steep, mountainous terrain. The solution was to hire people like me to hang plastic tape where the center line of the proposed road should go. In principle, the Bureau of Public Roads was not allowed to deviate from that pre-set line.

That work put me in a gorgeous, pristine valley up toward Crater Lake, an area filled with giant sugar pine trees standing on very steep slopes of decomposed granite. The trees stood at an angle of repose, rooted in material that looked like granulated sugar, held together by tree roots. Other than the rattlesnakes, the valley was lovely. When you hear a snake hissing and rattling, your hair stands up on end, especially when you’re all alone, miles from nowhere.

One day I stopped to eat a sandwich, my back against a giant sugar pine. The squirrels a hundred-and-fifty feet above me screamed and clucked in protest at my intrusion, and proceeded to wage war. Their weapon of choice was sugar pine cones, which can be as much as two feet long and landed like V2 rockets. Fortunately squirrels aren’t blessed with a very good aiming mechanism and the cones didn’t land very close to the base of the tree.

When I finished my reconnaissance of the valley and reported to Youngblood, he posed a question I couldn’t answer. That question altered the trajectory of my life.

(left) Standing at the base of a redwood tree scheduled for logging. That tree is now history.
Professor James Wallis  
School of Forestry  
Montana State University  
Missoula, Montana

Dear Professor Wallis:

Your name has been suggested to me by Bill Wheeler at Oregon State as one who might be qualified for and interested in a teaching position which we expect to have available here in September.

In general, we are looking for a man to teach a regular course in logging and wood harvesting, in the fall semester, and to teach a course in forest roads, in the spring semester. These are both upper class courses, in our forest land management program. This person would also be expected to maintain continuing liaison with industries and land managing agencies in the above subject areas, and to guide or carry out such special studies or research as may be possible within budgeted time and money, including direction of one or two graduate students.

We desire a forester with two to five years of appropriate field experience, who has at least a Master's degree and is interested in furthering his professional knowledge. The position will probably be that of Assistant Professor, with salary of approximately $7,000, depending upon the man's qualifications.

Should you be interested, I would appreciate your sending me a summary of your education and experience and at least two references so that we may be able to consider you. In event you are not interested, you may wish to recommend others among your professional associates who might care to learn about this opportunity.

Please act promptly.

Sincerely,

[Signature]

Paul F. Graves, Chairman  
Department of Forest Management

PFG: mh
“How,” he asked, “are you going to stop the whole mountainside from sliding down into the bottom of that lovely sugar pine valley after we have cut the trees and put the road in?”

I looked at him.

“I don’t know.”

None of the coursework I had taken addressed Youngblood’s question.

Remember that in the fifties the environmental movement hadn’t yet caught hold and there were no environmental laws. When they built roads in those days, they cut down trees, dynamited rocks and stumps too big for the D-9 caterpillars to move as a single piece then pushed the rubble clear of the roadbed. That continued until there was a solid base.

Youngblood’s question really bothered me in that it highlighted a serious problem. Maybe, I thought, I could find the answer in the process of earning my Ph.D.
I knew that if I was going to pursue university teaching as a career, I needed a Ph.D. I also wanted to go back to school to address the question of erosion, which I understood basically to be an engineering problem. I wrote a letter to David Todd, a professor of engineering at University of California, Berkeley, enclosing my transcripts from Oregon State and the University of New Brunswick; a brief resume; and a proposal for the work I hoped to accomplish. I received a very nice letter back. This all took place in the middle of the summer of 1958, and I was applying for the coming fall. David Todd told me that I had been admitted to the Engineering School, but that I had to be admitted to the University as well, so he had forwarded all my papers to the Registrar and doubtless I would hear from him soon. School was due to start in September and I hadn’t heard anything, so I rang up Professor Todd.

“Well,” he said, “I know all the courses you need to take, so why don’t you come and start school.” I did. As Christmas approached, with final exams on the horizon, I realized that I couldn’t receive any credit for the courses I was taking if I wasn’t registered. I went to the Registrar’s office, where I talked to a wonderful student wife.

“What’s the problem?” she asked me.

I explained. She went away and came back and said, “I have good news and bad news. Which do you want first?”
I didn’t care.

“Well,” she said, “the good news is that I have gone through the stack of rejected applications waiting for letters, and you’re not there.”

“The bad news,” she went on, “is that I have gone through the pile of acceptances, and your name isn’t there either.” That meant, she explained, that my application was buried in the even larger pile that no one had yet looked at.

I pointed out that exams were in a week, and as I had done the coursework, it would be most helpful if I were registered.

She said she would see what she could do.

A few days later, I was registered.

**MAKING FRIENDS WITH THE 610**

I applied too late for financial aid, and after three months I began to realize that I had insufficient money to continue at Berkeley. All of a sudden it struck me that I had better drop out of school for a while and find a job. The problem was that there were very few jobs in the Berkeley/San Francisco area for someone with my background. At one point, a UNB psychologist had run me through some aptitude tests and concluded that I could succeed at anything I put my mind to, but that I would probably be best as a salesman. I had no intention of going into sales.

So here I was in San Francisco when I would have been most useful out in the woods. Fortuitously, I heard that the Pacific Gas & Electric Company was surveying their lands around the reservoirs in the Sierras that they used to produce hydropower. They were looking for someone to determine the value of the surrounding timber.

I went to PG&E’s head office at 245 Market Street in San Francisco, only to
discover that they didn’t have a Forestry or Land Department listed on the directory. As the next best course of action, I went to the Personnel Department, which, under normal circumstances, I would never have done. I always felt that the Personnel Department was the last place you wanted to go to apply for a job. I had all my transcripts, including the First Class Honors from UNB.

The guy was impressed and sent me up to see a lovely Irishman named Joe Brennan, who was running a mini Operations Research Center with one other person. He was looking for a third member for his group, which was part of the valuation department. I discovered they had been looking for more than a year for someone with a Bachelor’s degree in math and a Master’s degree in statistics, and I was the closest they’d seen. Joe asked me three questions: I couldn’t answer the first two, but I told him where I would go to find the answers. That seemed to satisfy him. The third question was “Could I run a computer?”

“What’s a computer?” I asked.

In December 1958, computers were rare and primitive. They were certainly not yet part of the general culture.

“We have one,” he said, and took me upstairs to show me the IBM 610, which had been introduced in 1957. The 610 is often referred to as the first PC, and was about the size of three refrigerators. Total sales of the 610, each of which sold for $55,000, numbered a hundred and eighty. It had a 9-track paper tape with an input reader and punch, and an output tape reader, with a big tray for storing the tape if you had a calculation looking for a limit. The only way you could program it was to open up a board that looked like an electric telephone exchange, with wires that you plugged in from here to there. You actually made the electrons jump where you wanted them to jump.

Glancing at the unread manuals, I told Joe I could learn how to run the 610.
With my mother somewhere on the south coast of England, probably Brighton
This was Friday afternoon.

"Okay,” Joe says, “how about starting Monday?"

He rushed me through Personnel and I showed up Monday, only to find that Joe wasn’t there. It turned out that he was an alcoholic and had gone on a bender, so I took the manuals and learned how to run the computer on my own. By the time Joe returned, I was able to program.

Joe was the number one person arguing PG&E rate cases before the Public Utilities Commission. I went to the hearings with him, and before long he would ask me to program the situation at issue and provide him with supporting figures. I’d disappear back to the office, where I sometimes spent the night wet-nursing the computer, which only had a memory of seventy-eight bits. Hour after hour, the 610 would punch out paper tape: for a calculation looking for a limit, the reader had to go through every one of the negative responses on the paper tape before the 610 could continue to the next step. It was an incredibly slow process by today’s standards, but the alternative then was a roomful of people sitting for hours and hours with Monroe calculators. Using the computer, PG&E could now do these wonderful calculations overnight, demonstrating the necessity for a rate increase for this or that. The Commission, which did not have a captive computer at their disposal, had absolutely no way to challenge our findings. We won every rate case we fought.

Joe had studied statistics in Germany, but moved on before finishing his degree. His father had wanted him to complete his Ph.D., but Joe resisted putting the added financial burden on his family. He wanted to be independent. Joe always regretted that he hadn’t finished his degree, and made it his mission now to see that I went back to Berkeley to complete my studies. PG&E refused to let me work part-time
A letter from Joe Brennan to PG&E stating that I would be “difficult to replace” and reiterating his belief that the company wouldn't lose anything by taking advantage of my skills for five years, part-time.
in order to return to school on the grounds that I probably wouldn’t come back to work for them when I was through. Joe argued that it didn’t matter whether I came back because five years at part-time was all he needed, but Mr. Lage, the head of the Valuation Department, denied the application anyway.

Undaunted, Joe continued his efforts to find me a job that would allow me to go on with my studies. Every day, he sat there at his desk scouring the San Francisco Chronicle and the Examiner help-wanted ads. When he found something promising he would ring them up, with me sitting in the room, and explain that he had an employee who could do whatever job it was, and do it really well. The catch was that this guy (me) could only work part time because he was also going to school.

Joe was a great guy.

Eventually, I did find a job with the Pacific Forest & Range Experiment Station that allowed me to work and attend university. This involved a project on erosion on Forest Service land in Northern California, and it couldn’t have been more ideal because the office was only two blocks from the Berkeley campus. I worked for the Experiment Station during the seven years I was at Berkeley, and their project provided the subject for my dissertation, as well as material for a number of publications.

Because I was still a Canadian citizen, the Forest Service had to apply to the Civil Service Commission for a work permit on the grounds of “No Qualified Citizen Available.” Each application covered six months, and after three years of this the Civil Service Commission rebelled and refused to renew my contract.

“Look,” they said, quite reasonably, “in three years you could have trained a citizen.” The Forest Service solved the problem by turning the project funds over to Berkeley, which put me on the payroll as an associate engineer.

It was at Berkeley that Kathy came into the picture. I was in an organic
chemistry lab, doing very badly, and I needed a passing grade. A buddy of mine was doing equally badly, and together we concocted a plan. All students were given the option of dropping the last six official labs in favor of a special project, and he and I came up with one that measured the inherent erodibility of Northern California soils. This task required a special piece of spectrographic equipment, and Kathy, who was in charge of guarding this special piece of equipment, taught us how to use it. Kathy and I dated, married, acquired a house in Berkeley and had two children, Andrew and David. The house we bought was the ancestral home of the Jacuzzi family, and came with a very big garage where the Jacuzzi prototypes had been made. Grandmother Jacuzzi sold us the house for $18,000, of which we provided $1,000 and she and the bank provided the rest.

Both my friend and I earned A's in the course. Our paper on the subject was published in the Transactions of the American Geophysical Union.

**Computer Generation**

At Berkeley I took a course in factor analysis, which turned out to be very useful. At the time, no one had ever tried to use factor analysis to investigate problems with actual physical variables. I also discovered Dr. Meredith, a wonderful psychology professor who had masses of grants for work on the computer. I became chummy with his programmer. I had learned to run the computer while I was at PG&E, a rare skill to have in 1959, and decided along the way that I would write my dissertation on the computer. Dean Claxton was writing a computer program called IRMA, short for Information Retrieval and Manuscript Assembly, which allowed us to use the computer as a word processor in 1963, when there were no word processors available.
commercially. We used my dissertation to debug the program.

In those days, computers printed everything in capital letters on rolls of paper perforated along each side. I loaded up boxes and boxes of punch cards, fed them into the hopper and bingo, if the program queue wasn’t too long, I had my manuscript back in an hour or two. True, it was all in capital letters, but there were paragraphs and punctuation and all those good things.

This was a revolution. It was wonderful because I could take two or three chapters of my dissertation around to my committee and haunt them day after day to see if they had read it. I had five people on my committee, and four of them got fed up.

“Look,” they said in so many words, “there’s more than enough here for a dissertation; I don’t care to read any more of it; I will sign anything your major professor will sign.” My guess is that only one person actually read the dissertation all the way through, but all five signed it.

I was very interested in the subject and the conclusions. Originally I perceived erosion as an engineering issue, but I realized after a couple of years of writing that this wasn’t an engineering project at all. If we could identify areas that were prone to erosion more probably than others then we could avoid putting roads there. Thinking it might be a soils problem, I switched to the Soils Department and went off to find out what causes soils to erode. It was a statistical problem as well, so I was amassing all kinds of statistics and taking a number of geology courses. That’s why it took me so long to get through.

When the dissertation was virtually finished, I realized that erosion wasn’t a soils problem or an engineering issue or a statistical calculation: it was a socio-economic problem. We could prevent erosion if we wanted to, but it would cost someone
something, and chances are that that someone didn’t want to pay the price.

There are two times during the school year at Berkeley when you can formally complete your degree requirements, but there is only one commencement, and that’s in June. I was planning to turn in three copies of my thesis to the University on a Monday in January, which was already past the official deadline, but they shut down the computer center for three weeks over Christmas. My claim that I needed extra time because of their computer problems didn’t endear me to the Graduate Division. In those days the typing instructions for a dissertation were on the order of a New York telephone book. There was a specified font and margins were calculated down to the millimeter, requirements I found to be ridiculous. After all, my thesis had already been typed on their computer and I thought they should accept it as is. I didn’t think I should have to wait another month while the thesis was typed by a typist. Eventually they agreed to let me turn it in as a computer-generated dissertation, certainly the first of its kind at Berkeley.

My thesis was all ready to go in December, but I couldn’t run the final set of changes because I didn’t have access to the Berkeley computer. Instead, Bill Regan, the head statistician at the Forest & Range Experiment Station, arranged for me to go up to the Lawrence Radiation Lab, where all the physicists hung out and where they had three IBM 1794 computers. The lab was a top security center and required a pass.

The fellow at Lawrence Lab asked me what day I had last run my program IRMA on the Berkeley computer. I included a date on every page of my dissertation in order to keep track of the different, updated versions, so I was able to give him a precise answer. To today’s computer scientist, this might seem like an odd question, but it was relevant then. At a time when computer science was not yet a recognized discipline, computers were essentially Math Department toys. Every graduate student
in math at the time could alter the system code; if you put your program in and it didn’t run, you had to find out which math grad student had changed the operating system that was preventing your program from processing. When this happened, I wasn’t the most tactful person. You could even say that I was unpopular among the programmers because I made such a fuss when they delayed me.

The Radiation Lab wasn’t connected to the Berkeley computer, but they could mimic the university installation. Racks and racks of nine-track magnetic tape stored at the Rad Lab, provided a daily record of all operating systems run on the Berkeley computer. Once I provided the date, he loaded the operating system for that particular day, put my program on, ran off what I needed and I left with the “final” version on magnetic tape.

Forty-eight hours later I had three copies. Kathy was sure I had a girlfriend: there was no phone in the computer center, and I was determined to stay until the thing was done. New operating systems had a habit of crashing the computer, at which point someone had to start the operating system all over again. Before long, they determined that my program was causing the computer to crash, and asked me not to run it. The newly-installed operating system went down every time it hit the end of a file mark on the magnetic tape, and I had something like nine different files.

After days, during which I lived in the computer center, they straightened out their mess. I walked over to the north side of campus for pizza and a beer, then went back to collect my four copies, three for the university and one for me. Before I left, I set the computer to print a hundred and twenty copies.

After a little sleep I was faced with tearing each sheet of computer paper down the perforated edges. Fortunately, the Forest & Range Experiment Station printed a lot of its own manuals and reports, and they had equipment that removed the perforated
University Archives 7 April 1985.

Mr. James Wallis
Pacific Southwest Forest and Range Experiment Station
1960 Addison Street
Berkeley 94701

Dear Mr. Wallis:

Many thanks for your letter of the 30th and for sending along the sample of tape, and the cards. (May I say that despite your detailed oral explanation, I'm still sort of up in the air about how these things are done, but...)

I received a call this morning from the Computer Center about whether or not yours was the first computer-written dissertation; they didn't know, suggested that I call the Graduate Division, which I did, and they say, yes it was.

I'm toying with the idea of an entire exhibition on dissertations, centered around yours, which should provide tremendous public interest. I do hope that you will write, for CU NEWS, the Library's "house organ", a statement of how you accomplished the task. Perhaps six or eight sentences would do, although you may make it as long as you like. Something, too, that I'd be able to use to explain your dissertation in the exhibit.

Many thanks.

Sincerely yours,

J.R.K. Kantor, University Archivist.

UNIVERSITY OF CALIFORNIA—(Letterhead for interdepartmental use)

The letter from University archivist J.R.K. Kantor referring to the exhibition featuring my dissertation as the first to be computer-generated.
edges and separated out the pages. We ran the whole bundle through their system.

I took the four copies up to the Graduate Division in January of 1965. The riots and tear gas had exploded on campus in November 1964, and as a result, Sproul Hall, the Administration Building, which had been taken over by the students during the riots, was barricaded. Once the students had been carried out, the powers that be stacked sandbags around the building and installed the National Guard. The National Guard was still there when I went over to turn in my dissertation. I waited patiently until it was my turn.

The woman looked at the dissertation.

“What’s this?” she asked, pointing to the date in the upper right-hand corner of each page.

“That’s the date.”

“Well, it shouldn’t be there,” she announced.

“You should have told me that before,” I answered peevishly. “The Computer Center isn’t open, and I can’t make that change now. It isn’t my fault.”

“Oh,” she said in a worried way, “Mrs. Smith isn’t going to like this.”

I figured Mrs. Smith must be the one who measured the margins and all that.

In the end, they accepted my thesis. I went back to my friend Bill, and we cut and pasted all the other copies and put them into folders.

I have a letter from the head of the Berkeley Library indicating how radical my use of the computer was considered then.

“Was it true,” he asked, “that this was the first machine-generated dissertation accepted by Berkeley and how was it done?” He set up an exhibit in a glass case at the library, complete with punch cards, a bit of a program and a sample of the output. As far as I know, it is still there.
The Big Soil Robbery

By Harold Gilliam

A UC GRADUATE student digging around in the redwood country has made what may be this decade's most startling and ominous discovery about what is happening in California land.

James R. Wallis, a Ph.D. in soil science, has presented elaborate statistical research as evidence that in several redwood region watersheds, covering more than a million acres, every square yard of soil is losing an average six pounds each year by erosion.

From each square mile of these watersheds, he reports, an incredible four tons to six thousand tons of soil are washed away annually by rain and runoff.

This is soil that is literally priceless. Dirt is cheap only by the reckoning of people who fail to understand that life on this planet is an ongoing process and that it is a crime against humanity for any generation to destroy resources that its successors will need for sustenance.

Fires and Logging

Aldo Leopold has written eloquently about the creation of soil in his own prairie country: "The black prairie was built by the prairie plants, a hundred distinctive species of grasses, herbs and shrubs; by the prairie fungi, insects and bacteria, by the prairie mammals and birds, all interlocked in one humming community of cooperation and competition, one biota..."

This biota, through ten thousand years of living and dying, burning and growing, preying and fleeting, freezing and thawing, built that dark and bloody ground we call prairie.

It may be picayune to find fault with such a promising enterprise, but this writer must admit uneasiness with some minor aspects of this issue. In the course of some first-rate coverage by reporter Bruce Brugmann in garbage dumping in San Francisco Bay, there are suggestions as to alternative ways of handling the refuse. The only method listed here I would regard as acceptable is aerobic composting, which converts garbage into fertilizer.

Incineration would be ridiculously wasteful, even if it did not besmog the air. Putting garbage through the sewage systems overburdens the sewers, as home disposal units are already doing, and only leads to the further problem of where to pour the sewage.

Lachrymose Title

The magazine particularly commends the "landfill" method used in San Diego, Los Angeles and some Peninsula communities. A runway is filled with garbage and a park is planted on the surface. This is a gimmick also used to justify bayfill dumps: "We'll put a park on top." But, park or not, the result is destruction of the bay. And the result of the landfill method is the destruction of the natural landscape.

The greatest danger to which "Cry California" could succumb in its future issues is symbolized in its lachrymose title. The Californians know that things are in bad shape. What we need to know is how they can be fixed.

Presumably the magazine will not yield to the temptation to become merely a chronicle of land failures. "Cry California"
Mexican Standoff

I had annoyed the powers that be at Berkeley in a thousand ways. For example, you had to take an oral exam for your Ph.D. and the orals committee could not include someone with whom you had taken a course or an individual on your dissertation committee. The orals committee for my department had to include four scientists-at-large who would ask you questions about their own research. They appointed a biochemist as chairman of my committee. One of the other names listed was a mystery because I couldn’t even find him in the Berkeley catalogue. When I discovered that he was a physicist on the Davis campus, I phoned him and he suggested I go up and see him. He asked me a lot of questions over a period of about an hour and a half.

“I tell you what,” he said. “You’ve proved to me that you don’t know physics, but on the other hand you’ve proved to me that you can think. As far as I’m concerned you will have no trouble from me in your oral exam.” He was as good as his word.

Another of the five committee members was Clide Wahrhaftig, about the only professor in the Geology Department from whom I had not taken a course. My dissertation was clearly tied to geomorphology, but very early on I talked to Clyde and we became friends. We talked as professional colleagues, so there was no point in my taking his course. I had already picked his brains.

His idea of asking me questions about science in my orals was to dump three rocks on the table and ask me what they were—what minerals did they contain and how had they been formed? I picked up each rock and answered the questions, one by one, all completely correctly.

The third member of my orals committee was a professor from whom I had taken a summer field course. His was the only course at Berkeley in which I received
The cover of “Cry California,” one of the publications to which I sent my thesis
a B grade. He asked me a few questions and I answered them.

On the day of the exam, three of the examiners said that as far as they were concerned I had passed everything, a very rare statement in the world of Berkeley’s dissertation orals. Usually, they invite you to leave the room, they discuss the findings, then invite you back in to tell you whether you’ve passed or not. The problem was that the chairman, the biochemist, hadn’t shown up. Everybody else had finished and signed off by the time he arrived. He proceeded to ask me three questions that I couldn’t answer having to do with his biochemical research, and promptly told me I had failed.

As the chairman, he was the person who turned in the results. When he tried to turn in a “Fail” there was a Mexican standoff: he couldn’t persuade the others to agree that I had failed. It took more than a year to settle that. Meanwhile, the chairman and I had a personality conflict that grew steadily worse over the next twelve months.

Being a graduate student at Berkeley was a way of life. Graduation was something that happened eventually, but the idea appeared to be that you were having such a good time that you shouldn’t worry about it. As a result, they had a lot of very discontented graduate students who wanted to get on with their lives, and I was one of them. At one point Kathy and I attended the department Christmas party and sat opposite a Japanese woman. Kathy asked her when her husband was due to graduate, and she told that us he was scheduled to get his Ph.D. a week after their daughter graduated from high school. Their daughter had been born just after they arrived at Berkeley, eighteen years earlier. The system was ripe for revolution.

I went back to the Dean of the Graduate Division, complaining that I would never be able to satisfy the chairman and that I had already been at Berkeley seven years.

“How long will this go on?” I asked, irritated.
“I don’t know what you’re complaining about,” he said to me. “You’re still going to graduate faster than most people do.” He added that he was the only one who had completed graduate work in that department at Berkeley faster than I had.

The upshot of that conversation was my suggestion that they reconstitute a committee and I would take my orals again.

“Oh, you don’t want to do that,” he said. “Think of all the work you’d have to do. Come back in a week and I’ll see what I can work out.”

When I went back, the Dean told me that if I took an extension course in biochemistry and received an A, the requirements would be satisfied. It seems that the other three committee members were insistent that I had passed, a vote of three to one, so the Dean had come up with this compromise.

I agreed. What else was there to do? The extension course was taught by a chemist from the Shell Cracking Station, and it turned out to be absolutely fascinating. I had zero trouble getting an A.

I was finally allowed to turn in my dissertation, but it had been delayed more than a year. There were all kinds of committee meetings and disagreements among the faculty, what with the problems over the orals and everything else I’d done. I’m sure that at that point they were as glad to be rid of me as I was of them.

It is funny to tell about it now, but it wasn’t funny for me at the time. I was fit to be tied with the place. Looking back, there was something in me of “be reasonable, do it my way,” and they weren’t used to that. The administration had its own bureaucratic way of doing things, and didn’t look kindly on change.

The statistical procedure I developed for my thesis was new, and everyone who read it commented positively on what I had done. A famous British statistician on a temporary assignment to Berkeley, a woman who smoked big cigars, came stomping
into my office one day looking for reprints of some of my papers.

“I don’t read your stuff,” she sniffed, “but one of my students thinks it’s good and wants copies.”

I was doing things that no one else was doing, and there were people at the University who thought my work was worth supporting. My ideas were original for the time and totally out in left field as far as most people were concerned, not least because my work slopped over into five different departments at a time when cross-disciplinary studies didn’t exist.

Mine was the first environmental dissertation at Berkeley, right at the beginning of the environmental movement. I just happened to have all the necessary skills at a critical juncture. I didn’t have economics or political science, but I had degrees in three fields and a lot of knowledge in a couple of other fields. I also had a lot of practical experience. All this made it very difficult for anyone to attack me or my conclusions. I could go out there and set a choker or put a road through the woods with the best of them, so it was hard for critics to dismiss me as a wooly-headed academic.
The family revisited
(top row, l to r) My mother; Jeanie Van Stockum; Una’s third husband, Mike; Ann Berganon
(front row, l to r) Honor Wade; my cousin, Jim Van Stockum; Mollie Jones; Jim’s wife; Una;
Honor’s daughter, Patricia Wade

Photo taken at Aunt Una’s home, August 1969
The conclusion, as expressed in my thesis, was basically that the California Forest Practices Act was totally inadequate to deal with the erosion problem, and that the problem was caused primarily by factors that could be addressed. I sent copies of my manuscript to the Science Editor of the LA Times, the San Francisco Chronicle and the science writer for the San Francisco Examiner. I sent it to the Sierra Club and Cry California, and before long the shit hit the fan. The California Senate decided to hold hearings and I was subpoenaed to give testimony. Oh, dear. I was absolutely the villain, persona non grata as far as the power structure was concerned. They put some political pressure on, but at that time I was actually working for the University, so there was damned little they could do. They did manage to choke off funds, meaning I didn’t have money to run the computer or to attend meetings. Unless I was subpoenaed, no one was going to hear what I had to say.

Subsequently, the Forest Practice Act of California was declared unconstitutional by the California Supreme Court. Governor Brown, Sr. appointed Clive Wahrhaftig, the geomorphologist who had been on my orals committee, as one of the new commissioners, a post he held for the next twenty years. They had to write a whole new Forest Practices Act, so I think my research rocked the boat a little.
Despite claims to the contrary by the redwood logging industry, the practice of sustained yield logging—the process that theoretically will produce endless crops of timber—will become impossible on any meaningful scale over hundreds of thousands of acres in the North Coast Redwood country.

This prediction, which has long been voiced by many conservationists, no longer must rest on observation and subjective evaluation. It is now based on evidence developed by Soil Scientist James R. Wallis in doctoral studies completed this year at the University of California and in continuing studies at the US Forest Service’s Pacific Southwest Experiment Station.

It takes soil to grow trees, and present rates of erosion are so severe that, barring the establishment of controls, vast tracts of once-virgin redwood land will be stripped of their soil cover in what amounts to a fleeting moment of geological time.

Wallis found four principal causes for accelerated erosion: fire caused by human negligence and arson; lightning-caused fire; construction of unimproved roads, most of which are built for logging operations; and logging operations themselves.

Forty per cent of the logged areas he studied are losing soil at an average rate of more than 140 times that which is normal to undisturbed forest land.

The watershed of the South Fork of the Eel River, which covers approximately 384,000 acres, is losing soil, according to Wallis’ measurement at the rate of 5,789 tons per square mile each year, and, again barring effective controls, will be stripped to bedrock in 300 years.

Among other watersheds showing severe losses are the main stem of the Eel (measured at Scotia): 4,880 tons per square mile annually; the Van Duzen River watershed: 4,228 tons per square mile annually; and the Middle Fork of the Eel River (at Dos Rios): 4,012 tons per square mile annually. These figures average out at six pounds of soil lost per square yard every year.

To put it another way, more than a foot of the soil in these areas is being carried off by the rains every century. This means that soil mantles which average three and four feet in depth, and which took 30,000 to 40,000 years to form, will be carried off in just three or four centuries.

His evidence clearly points out that if we do not act to stop the process, we will have abdicated our responsibility to succeeding generations. We know what overcutting and overgrazing can do to land. China, Mexico and the Near East serve as telling examples of innocent land abuse which ultimately resulted in catastrophic erosion.

We can no longer claim innocence in our depredation. It does not take further study to recognize the need for erosion controls. Fires caused by human negligence, road building practices, and logging practices are three contributing causes which we have the power to alter now.

A subcommittee of the California Assembly Committee on Natural Resources, Planning and Public Works was recently formed with the express purpose of reviewing the State Forest Practices Act, which, as qualified observers will attest, is inadequate to protect our forest lands. It is not only weak, it is not enforced.

The hearings, which may begin in June, 1966, could and hopefully will lead to remedial legislation sufficient to avert the long-term catastrophe.
This was the charged atmosphere when I was finishing up at Berkeley and looking for a teaching job. In addition, no one wanted to hire a Berkeley graduate in the wake of the riots. Berkeley was a “bad address” in the mid-1960s, so things were pretty grim for me. The other problem was that people didn’t know which department to drop me into. Environmental Science was not a recognized discipline, exemplified by an advisor’s statement when he asked me why I wanted to work on environmental issues when there weren’t any of significance. That’s the way it was then.

I did have two job possibilities. The first was at the University of Washington, a joint appointment between engineering and forestry. That suited me perfectly. When they didn’t answer my application, I went up there to find out what was going on. It turned out that the foresters really wanted to give the job to a graduate of their forestry school, and it had been nothing short of an embarrassment to have my application appear on their desk because I was much better qualified than he was. In the end, Professor Campbell, the engineering professor who had urged me to apply, asked me to withdraw my application, and I did.

The second opening was at the University of Arizona, where they were setting up a Hydrology Department. Their Hydrology and Water Resources degree would be the first one in the country. I went to Arizona and found that they had hired one fellow already, Chester Kisiel, a person whose research I admired. We had been corresponding for about two years, but had never met. Halfway through the interview, we suddenly realized that we had been writing to each other all that time. He was going to head up this new group, and he certainly wanted me on board.

After my conversation with Chester, I went to meet the Dean of Everything and he was horrified by me. They put me on the plane with the assurance that I would hear from them in two weeks with an offer. I am still waiting.
One of the conditions for the interview at Arizona was that you had to have your degree in hand. You had to physically bring the parchment with you.

“But I don’t have it,” I protested. “This is February, and I don’t get the piece of paper until June.”

“Well, go to the Graduate Division and get a letter to say that you’ve satisfied all the requirements.”

It turned out that getting a letter to that effect was like trying to get a visa from the Polish embassy in the middle of the Cold War, something with which I have had personal experience.

I went back to the Graduate Division and took my place in the long queue. There was a little window behind which sat a young female. I clicked my heels together very smartly, but before I had a chance to say anything the woman said to me, “Oh, yes, Mr. Wallis, what can we do for you today?”

“For a start,” I said, “you can tell me how, out of 27,000 students, you know my name.”

She flashed an angelic smile and said, “Oh, Mr. Wallis, I’d never forget someone who has caused as much trouble as you have.”

I regard that as the high point of my career at Berkeley.

A Free Ride 1965-1967

Bill, my statistician friend, was going back to Harvard for a visit and said he would look around to see what was available there. When he returned from Cambridge he announced that I was going to be a Bullard Fellow and instructed me to write a letter to the chairman of the Bullard Search Committee. He wanted
to review the letter before I sent it. When I showed him what I’d written, he said it was too negative and sent me off to write a second version. Bill didn’t like that one any better.

Meanwhile, I was busy chopping up my dissertation for publication and dealing with the political waves created by my thesis, which basically asserted that unless they reformed the logging practices they wouldn’t have any forest to worry about. I never did write a third draft of my letter to the Bullard Committee, and I never needed to, because the head of the Bullard Search Committee wrote to me. He said he had heard that I was interested in applying, and enclosed a form for me to fill out. I was also asked to provide the names of three referees. Bill declined to write a reference, but advised me on my choices.

I was working as an Associate Engineer for Research at the Engineering School at Berkeley when God-almighty-in-charge-of-engineering-research, someone I had never met, called me into his office. He had heard that I was being offered a Fellowship at Harvard.

“Are you going to take it?” he asked.

I hadn’t bothered to answer Harvard because, as I explained to him, I didn’t see how I could accept. The Fellowship didn’t offer enough money, I had a wife and two kids to support and I had to get us all across the country.

“Well,” he ruminated, “if you use the Fellowship’s $5,000 stipend for transportation there and back and run the computer while you’re in Cambridge, then you wouldn’t have to file any expense accounts, would you?”

“No.”

“You see,” he went on, “if there are no expense accounts involved, it’s within my power to assign you to a temporary duty station anywhere in the world.”
November 5, 1965

Dr. James Wallis
2339 California Street
Berkeley, California

Dear Jim:

Please accept this belated thank you for participating in the October 16 discussion of forest practices. It was most interesting to Assemblyman Warren and me, although our initial concern over the difficulty of arriving at a precise problem definition and the apparent lack of data to substantiate a change in the law appears to have been well placed.

However, the decision has been made to proceed with a legislative inquiry into this matter, and the first public hearing will be scheduled for early next summer. I would appreciate it very much if you can continue to assist us as we proceed with this complex matter, and that you go on record where it appears justifiable, appropriate, and necessary.

Thanks again, and we look forward to further association with you in what we know is an important, and we hope is a successful, venture.

Sincerely,

O. James Pardau

OJP:dr
At the time, I was earning $13,500 at Berkeley. Add the $5,000 stipend to that and I would be making $18,500 as a student at Harvard. That was pretty good money in 1966.

I never asked how he knew Harvard was going to give me a stipend of $6,000—I had never mentioned it to him. On reflection, I am pretty sure that there must have been some powerful people who wanted me “out of the state.” My dissertation had caused a ruckus and made lots of people unhappy. They planned to put in a Redwood National Park and my dissertation asserted that there wasn’t much point in doing that unless they changed the California State Forest Practices Act and subdued the accelerated upstream erosion. If they didn’t revise their policies, those redwood trees would be destroyed by the sediment deposition. That was not what anyone in the power structure of California in 1966 wanted to hear.

The Bullard Fellowship was their way of getting me out of Dodge.

Strangely, that never entered my head at the time. On the other hand, I’m not aware of anyone else having been paid by a university to leave and go somewhere else to study. I presume even God-almighty-in-charge-of-engineering-research couldn’t have made that offer all on his own.

I thoroughly enjoyed my year at Harvard. The only condition imposed under the terms of my Bullard Fellowship was that I take one course for credit each semester—that was all. Otherwise, I was free to do whatever I wanted. I took Donald Price’s “Relationship of Government to Science” both semesters, and I audited about fifteen other courses, including economics, public policy, systems analysis and statistics. It was a wild time, a great time, and I was a big sponge, absorbing all this incredible stuff and meeting incredible people.
In November 1966, while I was at Harvard, I received a letter from Berry, David, Lewis and McInerney, attorneys-at-law in Oakland, California. This letter reiterated the fact that while I was having fun in Cambridge my thesis continued to stir up a hornet’s nest in California.

Mr. Berry wrote the following:

*Just recently I obtained a complete transcript of the hearings on the Forest Practices problem held in August. Before that, I wasn’t in a position to tell you exactly what happened there. Enclosed are copies of pages 143-146 etc. of the transcript, wherein Mr. Callahan, Secretary/Treasurer of the so-called Forest Protective Association [a spokesman for the lumber industry], comments upon your work. Since that time, I have debated Mr. Callahan before a meeting of the Society of the American Foresters and dealt his cause a great deal of punishment using your thesis as a bludgeon. I also used an independent study by Dr. Clyde Wahrhaftig of the University of California, which comes to almost the same conclusions respecting the rate of erosion.*

*During the debate I had a lot of fun with Callahan, pointing out that he knew nothing of statistics, and that your method had won a significant prize and a post-doctoral fellowship at Harvard. I also made much of the fact that Wahrhaftig came to the same conclusions using alternative methods. This was all too much for Callahan, who stopped talking about your questionable statistics and began to challenge your good faith and Wahrhaftig’s, too. This was all quite silly, I thought, and actually hurt Callahan’s cause with the audience.*

*Reading between the lines, I would judge that none of the members of the audience, composed mostly of Southern California members of the Society, by and
large watershed managers, were taken in by Callahan’s ranting because they realized (1) you and Wahrhaftig have the academic credentials and (2) Callahan does not and (3) Callahan himself had an obvious bias inasmuch as he is the paid front man for all the big lumber interests.

It nonetheless probably annoys you somewhat to have Callahan using your name in vain. Maybe you can challenge him to a debate before one of the learned societies. I bet we’ll see him scramble like mad for the tall timber if there is any left.

... You would be utterly amazed at the volume of conversations about forest practices now being carried on out here involving, to my amazement, some members of the School of Forestry itself. This is all to the good, as I’m sure our cause will benefit ultimately from free exchange.

At Harvard, I discovered Professor Harold Thomas Jr. from the Civil Engineering Department. He was the brains behind what was called the Harvard Water Program, where, for the first time, the idea of using systems analysis for the design of water resources had shown up. The book that came out of that project was known by everyone for the next fifteen or twenty years as the “Blue Bible.” Thomas was a wonderful, original mind, but in many ways he was an anomaly at Harvard. He had only about three papers to his name, but he had a wonderful selection of graduate students over the years who did great things. Thomas’s name never appeared on papers written by his students, a practice totally foreign to the usual “publish or perish” culture endemic to research institutions.

Professor Burden, a full professor at Harvard, had the job of keeping track of Professor Thomas. Thomas had so many things going on and was helping so many people with so many different projects that it was a full-time job keeping track of
him and his schedule. Thomas and I got along very well. He wanted me to stay on in Cambridge as a liaison between Berkeley and Harvard under an arrangement whereby Harvard would pay my computer time and give me an office, and I would remain on the Berkeley payroll. He thought I could be a useful bridge between the two universities. Harvard signed off on the idea because Thomas had such an illustrious reputation, but Berkeley was into budget cuts, the chief of the center had changed and no one there was in a position to make the decision regarding my continued stay at Harvard.

Once again, I was out of work.
Wild Duck
1967-1996

Professor Todd in Berkeley’s Civil Engineering Department, who had served as my thesis advisor, went on sabbatical and turned his position over to Professor Orloff. When it came time to read my dissertation, Todd was in Turkey and didn’t have anything to do with it.

Back from Turkey in 1966, Todd was elected to a two-year appointment as president of the Hydrology section of the American Geophysical Union. At the time, 1966-67, the Vietnam issue was raging, students were rioting on campus and the magic rallying cry for scientists was “Are you relevant?” For that, read “Are you relevant to the anti-war movement and the nascent environmental movement?”

Meanwhile, IBM Research was sitting in Yorktown Heights, home of their main think tank, dealing primarily with solid state physics (about fifty percent). The other fifty percent of their attention was focused on software, including computer security, networks, languages and email. They had company-wide email at the time, which they later linked up with a few universities. When I started with IBM in 1967 I had an email address, and I’ve had only two email addresses since then.

Spurred by national discontent, IBM Research formed a special committee. That committee came to the conclusion that, no, IBM Research wasn’t relevant to the times, and advised the company to institute a program in environmental science attached to the Research Center. Given the corporate culture at the time, where most of management
The picture I sent in when I was running for the presidency of the AGU Hydrology Section
had come up through the legal, advertising or data-processing divisions, this finding was really rather amazing. The committee also recommended that IBM management go out and find the world’s leading environmental scientist, offer him enough money to come to the lab and let him choose some colleagues from the field to round out the project.

Management hedged. “We don’t know who the world’s leading environmental scientist is, and even if we did, we’re quite sure he would be quite happy where he is.”

“Why don’t we choose someone who knows how IBM management and research works,” they countered, “and let him or her go out and find the best people.”

A very fine physicist, Sam Smart, was appointed chairman of the IBM Relevance Committee. His specialty was magnetism at a time when all the memory coils for early computers were magnetic. Sam took charge of the search process for environmental scientists and, after some thought, decided to narrow potential candidates to the field of hydrology. Water is very important and requires a lot of numbers and statistics, a role where computers could plug in nicely.

Then Sam narrowed the process down even further. Where do you find hydrologists? In this country, you could be a hydrologist in the American Society of Civil Engineers or you could be a member of the Geological Society of America (if you were a ground water hydrologist). The other place to look for a qualified hydrologist would be the American Geophysical Union, of which organization hydrology was a major component. When the AGU was founded, some very prominent hydrologists served in leadership roles, so Sam saw the AGU as a good place to look.

As an aside, when I ran later for president of the Hydrology section of the AGU, I sent in a photograph of myself hanging off a cliff in a McDonald’s tee shirt. They cropped it as much as they dared, but you could still see the top of the McDonald’s arches. One guy said he voted for me because anyone who would send in a photo of
April 25, 1966

Dr. James Wallis  
PSW Forest and Range Experiment Station  
P. O. Box 245  
Berkeley 1, California

Dear Jim:

Enclosed is a copy of the letter which I received some time ago from Dr. Smart of IBM describing the establishment of a small hydrologic research group at the IBM Research Center.

This appears to me to be an outstanding opportunity for a few hydrologists who have an interest in research and applications of computers. As indicated in the letter, I think that you can contact Dr. Smart directly for more detailed information.

Sincerely yours,

David K. Todd  
Professor of Civil Engineering

A letter from David Todd at Berkeley to Jim about the job at IBM
himself wearing a McDonald’s tee shirt had to be okay. I was very proud of two things I accomplished as the section president: one was bringing sense and order to the election of Fellows of the Union, and the second was arranging for the remaining proceeds from the Horton Bequest to be allocated solely to the Hydrology Section of the AGU.

Sam Smart sent a letter to the president of the Hydrology Section of the AGU explaining what IBM was hoping to do. He described the person they were looking for as someone who could do research and work entirely on his own: this person would have total freedom of choice as to what he wanted to work on at IBM, an unlimited computer budget and an industrial-scale salary. I have a copy of that letter.

Sam also selected five universities as likely sites for inquiries about up-and-coming hydrologists—Caltech, Berkeley, Stanford, MIT and Johns Hopkins—and sent letters to the deans. David Todd at Berkeley responded that there was only one person he could think of who fit those specs, and that was me. I never actually saw what Todd wrote about me, but that’s what Sam told me years later.

It is amazing when you think that in 1966 IBM, a major player in corporate America, was planning to gather a group of people to work on whatever they pleased in environmental science, with total freedom of choice. When you look at the three major projects that came out of the time I spent there, none of those projects would have attracted grant money on the open market. It is important to emphasize that I was able to accomplish what I did only because I had total freedom.

Over time, as IBM began to lose money, that creative policy changed. The field of research also changed for IBM, as well as for other corporations, when the tax laws were altered to specify that research had to be directly and obviously related to the company’s primary business to qualify as a business expense for tax purposes. That spelled the end of wild duck research.
I am on the right in this picture that accompanied an article in the IBM magazine.
Another Quarter Heard From

At the time Sam Smart was beginning his search for environmental scientists, I was preparing my dissertation for publication. One section went to Water Resources Research, a new journal in the field, and another I delivered in Montreal at a meeting of the International Association of Scientific Hydrology. When I won the Horton Award for best paper in Hydrology from the American Geophysical Union for part of my dissertation, travel funds suddenly became available, enabling me to attend the 1966 AGU meeting in Washington. This was just after the riots, and troops with machine guns were posted on every street corner.

Some of the presentations at the AGU were good and some were not. One was so dreadful that I walked out. In the hallway outside the meeting room I found a long leather couch and sat down. After a few minutes, the guy sitting at the other end of the couch stood up and came over to stand in front of me.

“You’re Jim Wallis, aren’t you? How would you like to work for us?”

I could see from his tag that his name was Sam Smart and that he was from IBM, a company with a reputation for white shirts and a buttoned-up culture. I thought he was kidding. He said no, he wasn’t kidding, and why didn’t I come to Yorktown Heights for the weekend and interview for a job instead of going back to California. They would pay for hotels and all expenses, including those incurred in changing my flights.

I said, no, I didn’t think I would. I told Sam I had applied to Harvard for a fellowship, and if it went through I would most certainly prefer that to joining IBM. I added that he could reach me at Harvard at the end of my year there, and I might consider an interview then. That’s the way we left it. I went back and forgot about it, figuring that IBM would do the same.
AGU Award
To Local Man

James R. Wallis, 38, of 2337 California St., has been named to receive the Robert E. Horton award of the American Geophysical Union (AGU) for the best paper in hydrology during 1965.

The paper, titled "Multivariate Statistical Methods in Hydrology — A Comparison Using Data of Known Functional Relationship," was presented at the Western National Meeting of the AGU and appeared in the 1965 fourth quarterly issue of "Water Resources Research," the chief hydrology publication of the American Geophysical Union.

Wallis is a soil scientist with the U.S. Forest Service Experiment Station here. A graduate of the University of New Brunswick, Canada, he received a master's degree in forestry from Oregon State University and a PhD from the University of California.
They didn’t. Sam must have had an automatic tickling mechanism set up because once a month he sent me a summary of the project, along with any papers they had produced, inviting my comments. I replied out of professional courtesy. That correspondence continued throughout my time at Harvard. Sam Smart always included something on the order of, “Looking forward to your coming down for an interview.”

At some point in January or February of 1967 I did go to Yorktown Heights for an interview. I quickly discovered that no one at IBM knew anything about the issues I was working on, but I was impressed by the fact that although it wasn’t their field, they were asking the right questions.

The IBM interview process was one of the most astounding things I had ever experienced. I ended up with the head of the Physical Sciences Group, who had six hundred or so Ph.D.’s reporting to him.

“If we were to offer you a job, and if you were to consider taking it,” he asked, “what additional offers would you be considering?”

I told him I might choose to stay at Harvard.

The only people who were allowed to talk to me about money were from Personnel, and they laid out the benefits and my salary and terms. I had been told that I would be entitled to an industrial-scale salary, but when they asked me how much money I expected, I didn’t know quite what to say.

“It says industrial-scale salary,” I pointed out, “but I have no idea what that means.”

“Oh,” he said, “it means that we rate you according to what Bell Labs would pay if you were working there, and pay you slightly more.”

“How many foresters does Bell Labs employ?”

“None. In your case we would rate you as a physicist.”
An article that appeared in the IBM magazine when I won the Outstanding Contribution Award
“Okay,” I said after a moment’s thought, “I want $20,000.” I was making $18,500 at Harvard, of which $5,000 was a payment from the Bullard Fellowship.

I figured I could sell my house in Berkeley, move to Yorktown Heights, buy a house there, and if I didn’t like it, I could sell up and move back and still break even.

“Well, that might be a little high, might be a little low, but it’s about right.”

The next week I received a letter confirming the offer of $20,000. I didn’t answer because I wasn’t at all sure I wanted work for IBM. I really wanted to teach, but I couldn’t find a university job. Eventually, Sam rang me up to ask if I had received the letter from IBM. I said I had.

“How long do I have?”

“That depends on whether you really haven’t made your decision, or whether you’re hoping someone else will take the job and you won’t have to worry about it.” He added that if I was serious about IBM, I had as long as I wanted.

The spring of 1967 found me finishing up at Harvard, without much prospect of staying on there and with no other jobs in sight. I was getting ready to go to the annual AGU meeting, and I was sure that Sam Smart would be there. I decided I should write to tell him that I would take the job. When we met at the AGU, he told me I could start any Monday after July 1. The Fourth of July was a Tuesday, so I started on July 3rd 1967, and took the next day off.

I worked at IBM for thirty years, and in the course of that thirty years they only asked me three times to work on a particular project. Other than that, they left me completely alone. To work that way, you have to be quite sure that what you’re doing is what you should be doing. I can think of lots of good scientists for whom such an arrangement wouldn’t work, but it worked perfectly for me.
Receiving my first Outstanding Contribution Award at IBM
One of my first projects at IBM involved a paper I had written, a paper that had been criticized by Nick Matalas, a head-honcho in USGS water research. Professor Thomas at Harvard arranged for a joint seminar where Nick and I could present our sides, but when push came to shove, Nick and I didn’t really have conflicting views. In the end, we worked together for five or six years publishing all kinds of papers, Nick at USGS and me at IBM.

IBM Research was changing. By 1967, they were putting about sixty percent of company money into hardware—silicon chips and memory units and things like that; thirty percent into software. Ten percent of the budget remained free-floating to support what they called the “wild ducks.” Wild ducks, including me, could work on absolutely anything. IBM understood they couldn’t cover the whole field of science, but when a problem outside IBM’s field of expertise came up in the future, they wanted to have someone available who knew what the words meant and who they should talk to. I was hired as a wild duck in environmental science in 1967, and from that time on, they never said boo to me.

My first performance report appeared as a form prepared by the Personnel Department, page after page of questions regarding my accomplishments. The answers were to be filled in and commented upon by my manager, Sam Smart. Sam didn’t fill in any of the blanks, and in the space for additional comments he simply said, “Performing as expected. No major problems.”

I signed it. Three weeks later, I received my first Outstanding Contribution Award from IBM.
Going Corporate
In 1970, at the height of the Cold War, just after the Polish riots in Gdansk, I was busy doing research and publishing papers when I received a handwritten note from a fellow named Kaczmarek. He was, it turned out, number three in the Polish Communist Party; the Minister for Science and Education; a professor of hydrology at a Polish University; and Secretary of the Polish Academy of Sciences. I had never heard of him. Kaczmarek was in California, and he wanted to come and see me at IBM Research in Yorktown Heights.

I took Kaczmarek’s letter to the head of Personnel to see if such a visit was possible.

“Oh, I don’t think so,” he said, “but we’ll ask the State Department.”

I learned that the Russians had blocked off parts of their country to United States personnel, so our State Department had closed off parts of the U.S. One of the areas where the Russians were persona non grata was the east side of the Hudson, north of New York City, all the way up to Poughkeepsie—IBM land.

The head of Personnel contacted the State Department, and within twenty-four hours he was told that Kaczmarek could come to Yorktown Heights after all. The top brass at IBM Research, figuring that Kaczmarek had to be a double agent, wanted to meet him and arranged a luncheon.

When we met, I discovered that an international conference on Mathematical Models in Hydrology had been scheduled in Warsaw for the following July, and
Kaczmarek wanted me to give a paper. Could I, he asked, come to the meeting?

“Don’t ask me,” I said, pointing to Ralph Gomory, the head of Research. “Ask him.”

On the spot, Gomory replied, “Yes, of course.” I was all set to go to Poland.

Six weeks before I was due to leave for Warsaw I discovered that I needed a visa. I went down to the Polish Consulate in Manhattan, where I was told I would have to go to Washington, which I did the following week. I took a taxi from National Airport to the Polish Embassy, a well-protected mansion with a little old lady sitting at the front desk. When I explained that I wanted a visa, she asked if I had my passport and thirty dollars, then told me to go into the other room and fill out the form.

I began to read the questions, all written in Polish-English.

“Is this your first trip to Poland, and how long have you been there?”

They only allowed one inch for the answer, and I didn’t know how to answer anyway because I wasn’t sure what the question was.

I went back to the little old lady and she gave me the answers.

I returned to the other room. About half an hour later a gorgeous Polish blonde came in, handed everything back to me—money, passport and visa application—and told me my application had been rejected. I laughed.

“Would you please call your boss down here,” I said. “This is an international meeting, I have hotel reservations, I was invited to attend,” and so on.

Eventually, her boss came in and confirmed that he couldn’t give me a visa.

“Why?”

“Because you’re too late applying. It takes six weeks.”

“Why does it take six weeks?”

“Reciprocity demands it. Your consulate always takes six weeks to process a visa to come to the United States, so we will take six weeks to give you a visa.”
I laughed. He told me it wasn’t funny.
I told him that Kaczmarek had come personally to Yorktown Heights to invite me to the meeting. That wasn’t good enough. I had to have a written invitation on Polish Government letterhead.
I went over to see Nick Matalas at USGS in Arlington, Virginia. He had been on the U.S. International Committee that had agreed to have the meeting in Poland. Everyone he phoned in Washington in an attempt to rectify my visa situation was in a meeting and could not be disturbed.
“This is ridiculous,” he said. “We need to call Kaczmarek.”
We had a few beers while we waited to call Poland. Nobody knew how to call Eastern Europe in those days, but eventually I reached an operator who could help. By now it was five in the afternoon in Washington, and everyone on the East Coast had gone home. Nick wanted to charge the call to my office phone rather than to his. Fine. I explained this to the operator.
“Is there anyone at your office?”
“No, it’s after five o’clock and everyone has gone home.”
“When will someone be there?”
“I’ll be there tomorrow.”
“Oh, that’s all right then.”
Eventually Mr. Kaczmarek came on the line. I explained what had happened, and asked if he still wanted me to come to the meeting. If so, I said, he would have to do something about my visa. There was a lot of heavy breathing on the line; for that amount of breathing, there had to be at least six people listening in. There was a deathly hush at the end of my little speech, then a voice came on and said, “Vee got the wrong Kaczmarek.”
“Can you find the right Kaczmarek?”
“He lives with his mother, and is out right now. He will be back.”
At 2:00 a.m. Polish time Kaczmarek rang us. I explained the problem.
“Okay,” he said, “I will see the Foreign Minister in the morning. Good bye,” and he hung up.
I caught the last plane out of National and was back in my office in Yorktown Heights at about ten o’clock the next morning. There, sitting on my telephone, was a message. The Polish Consulate had called and my visa was ready.
I rang Nick and he sent one of his researchers over to pick it up.

At the conference in Poland, the real science superstars all had private assistants, part NKVD and part guide. Anything you wanted, they knew where to find it. Much to the amazement of all my friends, including Enda O’Connell and Nick Matalas, I was assigned a personal guide by the name of Gabriella. She was my own personal spy, and was there to arrange anything I asked for. People on the street offered to change dollars for zloty at the black market rate, but that wasn’t practical as visitors were required to prove that they had exchanged any hard currency at the official exchange rate. If you couldn’t account for your American Dollars, German Deutsch Marks or British Pounds, there was a good chance you would spend the rest of your life in a Polish jail. Nick had cautioned me about that.
Our first day in Poland, they took the big shots out for lunch, and I was invited. The waiters came around the long table, and Gabriella, sitting on my right, translated. I was looking at the menu and listening to what people were saying, when I realized the items were listed on the menu they just weren’t available. I asked Gabriella what was going on.
“It’s Monday.”
“What’s that got to do with it?”
“The government passed a decree that you can’t serve meat on Mondays.”
“Why?”
“To cut down on the per capita consumption of meat.”
“How long has that law been in existence?”
“Seven years.”
“Has it cut down on the per capita consumption of meat?”
“You’re a stupid man to ask that question.”

For the next three days, every time I asked Gabriella a question, “stupid man” was her first reply. There were many things I wasn’t supposed to ask, but Gabriella felt free to ask me a lot of questions.

“Vot do you think about the Pentagon Papers?” I didn’t even know what they were, let alone think about them. Most of my answers were facetious. She’d stamp her foot and say “stupid man.” Nick suggested that the way things were going, I had better travel with him to Athens on Wednesday instead of returning to London on Saturday as planned. I told Gabriella I wanted to change my reservations and fly to Athens instead.

“It can’t be done.”
“What do you mean?”
“It takes three days to change reservations.”
“That’s ridiculous. They press a few buttons on the computer, you give them some money and it’s done.”
“No, it can’t be done. I won’t help you.”

Wednesday morning I went to Kaczmarek.

“Something’s come up,” I said. “I want to go to Athens today with Nick, and I need
My brother David and my sister Roses when they visited me in New York
to change my tickets."

He assigned me a car and driver. We went to the Polish airline office, which was crowded as hell, where we waited in a long line. We were in the wrong line; over to another long line; again, the wrong line. After waiting in a third line, it was finally my turn. I clicked my heels.

"Oh yes, Dr. Wallis. What can I do for you today?"

I had just enough money to change the ticket, but then he wanted to see my passport. The desk clerk had confiscated it when I arrived and wouldn’t return it until I left. When the airline representative rang the hotel, the man at the desk refused to look for my passport and hung up.

"I don’t really need the passport," he said as he put the phone down. "Do you remember the number?"

"How many numbers do you need?"

He wrote the numbers down as I spouted them off, and stamped my exit visa. It was now 10:30, and the flight was due to leave at 1:00, twenty miles away from town. He handed everything back to me and reminded me that because this was an international flight, I had to be at the airport one hour before flight time.

Back at the hotel, I packed and we headed to the airport. There were Russian tanks everywhere along the route. We arrived at the airport at 12:30 to find that the Customs inspectors were having lunch. I cooled my heels as I watched Nick on the far side, waving at me. Eventually an inspector came along, opened my bags, closed them again, and I joined Nick. They drove us out to the plane, I climbed on board and told Nick the story.

When we looked at my exit visa and my passport, there wasn’t a single number that matched.
You should know a river's moods if you live along its banks.

Through the centuries, Florence has flourished on the banks of the Arno River. Today, it's a vital city of commerce and industry. A renowned centre of art and architecture. And the river contributes to its charm.

But not always. The Arno can burst its banks and flood the city—as it did in 1966. Destroying art. Damaging buildings. Disrupting lives. Such a catastrophe is an ever present threat wherever a river runs.

That's why specialists at the Pisa Scientific Centre are working with Italian University and Public Authorities to meet the challenge. They're experimenting with computer mathematical models which can supply hour-by-hour rainfall-runoff forecasts, discharges, water levels and flow by time. Although only a small part of the Arno River Basin has been studied to date, the computer models have demonstrated an ability to give reliable advance information on floods. Another step in understanding the river better.

Whether it's helping analyse automobile exhausts in Germany, planning urban development in Canada, or managing water resources in France, man is using computers to help make his world a better place in which to live.

Computers help people help people

IBM
During the go-go years of research in the early 1970s, IBM set up what they called Scientific Centers in every country where they did business. These centers were staffed entirely by nationals and were designed to focus on “problems of local interest,” which invariably turned out to be environmental problems. One of the IBM centers was working on the accelerating subsidence of Venice. Another, in Pisa, was looking into what could be done about the frequency of floods, and ways to mitigate the effects. Because the employees in Pisa had been forced to go to the office by boat for two days after the flood of 1966, they decided that Arno River floods qualified as a problem of local interest.

The Italians in the Pisa center had been working on the flooding problem for four years when the head of the Scientific Center there visited the IBM lab. In Yorktown Heights, he discovered that there was a hydrologist—me—whom he should see. I was sitting in my office when he banged on the door, and I found myself face to face with an Italian man, accompanied by an interpreter, trying to explain their work on a model of flood predictions for the Arno.

I interrupted to explain that I didn’t think what they were doing was going to work, and why. He asked whether I would consider becoming an advisor on his project. Of course, I accepted.
When I arrived in Italy as advisor to the Arno project, I was told to go around the office so that everyone could tell me what he or she was doing. I thought it was stupid until I came to Ezio, who was working on a Ph.D. at the university at the same time that he worked for the project. This picture was taken later in Milan. I loved his calendar.
When I arrived in Italy, I discovered that they had already done the very thing I had told them wouldn’t work, and it hadn’t worked. I could have saved them a lot of time.

Just before I left for Italy, someone in Personnel invited me to lunch. Also at lunch was a young Italian girl who would be studying for her Master’s in systems analysis at Stanford and working in IBM’s Palo Alto research lab. I was sitting opposite this girl, who, in 1972, was wearing seventeen different colors of eye shadow. I was totally bemused. When I told her I was going to become an advisor to the Arno project, she asked me what an advisor did. I told her an advisor was someone who took questions between two and four in the afternoon on Tuesdays, and gave advice between two and four in the afternoon on Fridays. An advisor, I continued, didn’t care whether someone took the advice or not, because it was the other person’s problem, not his.

Flashing an angelic smile, she told me I was going to love Italy. I did.

I didn’t find out until it was about time to leave the States that I needed a work permit for Italy, but I didn’t worry about little things like that. IBM Italy insisted that I stay in Italy for at least one year; IBM Research said I couldn’t stay away for more than a year, so there was really only one day I could return to the States in order to satisfy both parties! That day came and went as I became increasingly involved with the work. All this time, I was on full IBM salary, deposited into my bank in New York, plus an additional forty percent of my pay in lira to compensate for the hardship of living in Pisa. The hardship allowance was enough to support a family of four quite comfortably in Italy. I never touched my paycheck.

We—my wife Kathy, our two children and I—traveled across the Atlantic on the SS France to Hamburg. I gave a paper in Helsinki, following which we drove down to
Sandra Scrimali, a friend, a member of CAI and a student at Pisa Medical School. Photo taken at Procinto Refugio 1974.
Switzerland. At this point, I still didn’t have my work permit, so I called to ask IBM Italy what I should do. They advised me to enter the country as a student.

The week after I arrived, I was asked to give a talk at a conference at Bologna Polytech. The project boss warned me I would probably be invited out to dinner following the conference, and told me I should pick up the bill on behalf of the company. I put it on my American Express card.

I was given an honorarium for my talk at the symposium, and on my return I showed my boss the check and asked him what I should do with it.

“If I had seen it,” he said, “I would have told you to put it into your bank account.”

Then I handed him the bill for the meal. He gave a long whistle.

“Wow,” he exclaimed, “that’s way over IBM guidelines. On the other hand, the guidelines are written in Italian, and we wouldn’t expect you to be able to read them.”

Every time there was someone to entertain over the next eighteen months, I seemed to be the one doing it. When IBM Milan complained to IBM Pisa about the bills, the issue was shunted aside on the grounds that I was “patso Americano.”

We lived seven miles from the coast, separated from the Italian equivalent of Camp David by a national park. When my sons Andrew and David wanted to see the wild boars that roamed the park, I said okay.

Giant billboard-like signs, all written in Italian, announced “Pain of death, no admittance, you’ll be shot on sight,” as we approached the high-security area. Of course, we just walked past them all. We followed the animal tracks, took some good pictures of the wild pigs and landed up on the coast, north of the river. At that point, the kids decided they didn’t want to walk back through the forest.

“That’s no problem,” says I, “we’ll just walk down the beach. The presidential
June 21, 1973
RES. - Thomas J. Watson Research Center
Yorktown Heights, New York
412 - Placement and Counseling
862 -- 1598

Assignment to the IBM Scientific Center in Pisa, Italy

This memorandum confirms our discussions and your discussions with Dr. S. Smart relative to the terms and conditions of your assignment.

It is anticipated that your International Assignment will be for a period of one year. It should be understood, however, that the length of your assignment is based upon present position requirements at the work location and is subject to change at the discretion of IBM.

Your International Assignment Employer is IBM, Italy. Upon completion of the assignment, you will be expected to return to your Home Country. While you are on assignment, the provisions of the International Allowance Plan (COM.-14), as amended, will apply.

1. Base Salary Your monthly base salary, is $2,417.00 and will be paid by Yorktown Research. Should present or future law of the work location country require payment of bonuses or profit sharing payments, your base salary will be adjusted so that your monthly compensation does not exceed the amount indicated above.

2. International Service Allowance (ISA) You will receive an ISA of $704.50 per month. This amount is based on the following:

- Your assignment work location in Pisa, Italy
- You are married and have (2) eligible children/dependents.
- You are not authorized to ship household goods.

Payment of the ISA will begin when you are no longer on an expense account basis. It will terminate when you leave the work location or go on expense account at the end of your assignment whichever comes earlier. The amount of your ISA may, during the term of your assignment, be increased but not be decreased except as required by relative changes in currency values.

A page of the terms and conditions of my posting to Italy
palace is there, and I’ll bet you there’s a road out to the sea that we can use.”

Sure enough, we walked down and found where that road came out to the sea, as I suspected it would.

“You wait here,” I said to Andrew and David. “I’ll see if this is all right.”

As I walked up the road, the palace carabinieri met me with submachine guns cocked, pointed in my direction, and asked what I was doing. They didn’t speak English, and my Italian was pretty horrible. They wanted to see my papers, but I didn’t have them with me. Eventually, I asked if I could take out my wallet, and I showed them my business card, IBM Centro Scientifico Pisa.

“Oh, IBM!!! Go straight through.”

“Duo bambini on the beach, okay?”

The two guards were waiting when I returned with the kids. When we came to the palace, one of the men mentioned that the president wasn’t in residence and asked if we would like to look around the gardens. A guided tour around the palace followed. When I recounted the experience, it turned out that the only people in Pisa who had ever seen the palace were the carabinieri and me.

My wife hated Italy, and spent most of her time at the Officers’ Club at the Livorno Army base. My kids went to the Army base school. I, on the other hand, went totally native. Among other problems you love to have, here I was, a research nerd, being literally chased by females. I had no idea what to do.
Some of us took to climbing the west wall of the IBM Research Center at lunchtime, practicing our technique on the stonework. I am just behind Carol. One day, I was late to work, and when I arrived, everyone was stunned to see me. It seems someone was in the process of climbing the World Trade Center and they had been convinced it was me.
Italy and the Climax Forest
1973-1975

I had been in Italy a week when the phone rang. The caller, who worked for an advertising agency hired by IBM, said they wanted me to fly back to America to shoot a commercial about some research I had done on what was known as the climax forest. The advertising people were of the opinion that the actual researchers should appear in the commercial. When I told them I had just arrived in Italy and had no intention of flying back, they offered to return me to America for a few days of “essential shopping” to stock up on items I had overlooked. I told them if they put that in writing, I’d do it. The Italians on the Arno project came up with all sorts of wonderful ideas for things they wanted to give their nephews for Christmas, important items like a jigsaw puzzle of the Golden Gate Bridge, so I had a huge collection of essential shopping to take care of. I went back to Italy with everything on my list.

The project featured in the commercial concerned an early IBM computer simulation, produced in a cooperative program with Yale, of what are now known as gap models of ecologic multi-systems forest growth. Basically, we were saying that there are multi-species of trees, all with individual niches and individual strategies for survival, all differing in life span, amount of water and light required. Our theory postulated a continual dynamic renewal process, with forest composition in dynamic equilibrium. This countered the prevailing theory, a theory the pundits adhered to and taught in forestry schools, advocating that natural processes resulted in what they
A Sixty-Year-Old Forest Simulated in a Minute

How can you log a forest without causing soil erosion and dwarfism or destroying the atmosphere for campers, hikers and fishermen? Up until recently clear-cut answers have not always been available—not only because of the complexity of forest ecosystems but simply because trees do not grow fast enough for controlled experiments.

Now with the help of a computer simulator one can "grow" a two-and-a-half-acre portion of a forest at the rate of a year a second and immediately see the effects of a wide variety of simulated conditions. This development, according to one of the originators, allows research studies to be made which would ordinarily require centuries in an actual forest.

The project developed out of a cooperative effort between the Yale University School of Forestry and Environmental Sciences and IBM's Thomas J. Watson Research Center in Yorktown Heights, New York. Dr. Daniel B. Botkin, a Yale ecologist and two IBM researchers—Dr. James R. Wallis, a hydrologist and Dr. James F. Janak, a theoretical physicist—worked together on a mathematical model for forest growth to simulate environmental factors and various properties of each of the tree species in one ecosystem, so that hypotheses about the interactions could be made and tested.

Dr. Botkin and others collected the original data at the Hubbard Brook Ecosystem site in the White Mountains of New Hampshire, which contains 13 different species from sugar maple and white birch to mountain ash and red spruce. They then worked up a number of relatively simple equations to represent many of the interrelated conditions which affect the growth rate of a tree—soil quality, climate, topography of the plot and competition from other trees.

These key equations were included in the subroutine, Grow, along with two other subroutines—Birth and Kill. These took into consideration the annual growth increment for each tree, random planting of new saplings and killing off of other species to reflect the cumulative effect of weather, plant succession and competition.

While the original model deals with a limited number of variables, it has the capacity to handle an infinite number. Pollution, insect infestations—even the rate at which deer nibble young systems.

Dr. Wallis notes: "While the present simulator reflects conditions of a forest in New Hampshire, it is especially adaptable to many other ecosystems.

The computer model developed by the three scientists is the first of its kind. Other computer programs have simulated simpler patterns of growth and development—projecting, for example, productivity in a corn crop—but none before had been able to reproduce the major characteristics of a system as complicated as a multi-specied, mixed-age forest.

One of the most enthusiastic users of the forest simulator approach has been a multi-university research project on the West Coast funded by the federal government. Scientists there, along with researchers from Washington State's Department of Natural Resources, hope to adapt the forest model to the entire western region from Alaska to Southern California.

It is possible in the not-too-distant future that foresters will be using the computer on an everyday basis to plan reforestation of land swept by fire or clear cut by loggers. In that event the computer will be able to furnish such information as how many trees to plant, which species, and how often they should be thinned—all depending on the particular ecosystem of the region.

America's forests are one of our most valuable natural resources. With computer simulation, the best conditions for maximizing the growth of our forests can be determined more accurately.
called a climax forest. Ecology was based on the assumption that the mature forest—the climax forest—would comprise a dominant species. Once the climax forest had established itself, that was that. The forest would stay that way indefinitely.

Conversely, our gap models implied that there was no such thing as a climax forest, that there was no status quo. What you have instead is a series of random accidents constantly occurring in forests. A tree is blown over in a windstorm, leaving a big gap. Plants that like a lot of light come in and grow there, but they don’t survive very long before another, more efficient, species crowds them out. Continuous, random changes take place in this mixed community of species, all of which are fighting for their niche. Things are changing all the time on a very small scale throughout the entire history of the forest. We claimed that it was just an accident to find a forest comprising a hundred percent sugar maple or a hundred percent beech or white pine.

Now, the concept we modeled on the computer is widely accepted, but it was incredibly controversial at the time. For 1970s ecologists, this was an eye-opener. Our findings created an uproar.

The gap model we explored in cooperation with the Yale School of Forestry was one of a series of short, weird and wonderful cooperative research projects that IBM Research undertook one summer. It was natural that I be involved. We went to New Haven, where we met a senior and exceedingly stuffy professor who was primarily interested in talking about the order of names on any publications emanating from this cooperative effort. He wasn’t interested in what we were actually going to do or how we were going to do it.

Daniel Botkin, then an assistant professor at Yale, knew of a large data set that had been collected at Hubbard Brook, where there were multiple plots, each with
I am on the left, Yurik Collaser is on the right, climbing in the Dolomites, 1974
different mixes and sizes of tree species. In the course of our conversations, the question came up as to whether we could create a model of forest growth that would explain the observed data. I was put in charge of the project.

We were successful in modeling the forest and first presented our gap model at a meeting on Long Island. We called our model “Jabowa,” derived from the names Janak (a physicist); Botkin (an assistant professor at Yale); and me (the “wa”). Jabowa is the first example of a gap model, and it was a very hot concept for several years. Jabowa was also one of the three major projects coming out of my time at IBM.

This project is a good illustration of the way in which radically different solutions emerge when you are free to let your mind wander without regard to existing science. The freedom afforded by IBM allowed us to reach an innovative and important conclusion. Conversely, the gap model would never have seen the light of day in a university environment, where research is dependent upon grants and the power structure is voracious when it comes to protecting its interests.

Now IBM wanted me to make a commercial about the gap model, but I proved to be incredibly bad as an actor. I had about ten lines to say, and I always got them wrong. Finally the script writer stormed furiously out of the filming room. The producer told me not to worry, that they had lots of takes and they could patch it together and it would look fine. Later, the script writer sent me a note: “What else can I say? You have great future in sound!”

My script called for me to say the word “spruces” instead of the correct plural form, “spruce.” When I pointed out the grammatical error, they argued with me instead of looking it up in the well-stocked library one floor up. In the end they took a vote: the woman taking out the trash had a vote, as did the woman who had wired me for sound.
“Over the Hill”
El Dorado, Canyon, Colorado
All votes were weighted equally. Thank God, “spruce” won by one vote.

They had also scripted Yale’s Professor Botkin to stride past a beautiful red dogwood tree outside the research lab. The producer loved the shot, but I felt compelled to mention that there are no dogwoods in New Hampshire, where the commercial was set. The producer said that if I noticed the dogwood, he was sure to receive ten thousand letters about it and he wanted it changed. He shot the scene again in front of a birch with brilliant yellow autumn leaves.

The commercial was displayed on national television while I was in Italy. IBM sponsored Katharine Hepburn in a PBS production of “The Glass Menagerie” in 1973, and there was only one commercial interruption—ours. It didn’t play in Italy, but I was deluged the next day with messages from people all over the world who had seen it. As a result of that commercial, a lot of companies began to use our computer model for forest management.

While I was in Pisa, I was introduced to Giovanna Finzi (as in the garden of the Finzi-Continis), an Italian girl who appeared to be about eighteen years old. She was working on her Ph.D. in Systems Analysis at Milan Polytech, and had exercised some of her political pull to work for me. As part of the degree program, Milan Polytech sensibly required a six-month work/study assignment with a company. Giovanna said she had chosen me because she wanted to do her dissertation on the continuation of a paper I’d published.

It was hard to see how Giovanna was going to “help” me when she didn’t speak a word of English and I didn’t speak a word of Italian. The last thing I needed at the time was a young female assistant who was mathematically gifted but who knew nothing about computers. She did identify a major error in a widely-used EPA computer program: when I insisted that she publish her finding, she agreed,
My Club Alpino passport
but held out very strongly that it would be better for her if I appeared as co-author. She and I produced three joint papers before she graduated, which provided quite a boost to her career. Giovanna went on to become a full professor.

While I was in Italy, I climbed in the Apuanes, the Alps and the Dolomites. Three of us—including a Polish graduate student, now a professor in Canada, and an Italian Count, now a professor in California—climbed together. I was a member of the Club Alpino Italiano, which required an identification similar to a little passport with your picture in it. Every year you were given a stamp depicting a different Italian wildflower, and that stamp entitled you to a discount at all the refugios.

I had two pictures taken for my club passport and I remember asking Giovanna which one she liked best. The other I threw into the waste basket. Many years later, when Lois and I were visiting a now-married Giovanna and her young family in Italy, Giovanna gave the other passport picture to Lois. She had fished it out of the waste basket and kept it all those years.

One of the critical clauses of my contract stated that I wouldn't pay any more in tax than I would have if I had been working in the U.S. After a few months in Italy, there was a crazy mix-up with my salary that had me owing a huge amount of money to the Italian government! Just before Christmas, when all the big boys were away, I called to complain to IBM accounting headquarters in Milan. Someone low-down on the totem pole answered and agreed to solve the problem by reversing the negative in front of the account and making it a positive. As a result, tons of money was deposited into my account.

When the senior accounting guys returned from holiday, they spotted the error and said it would have to be remedied. Ciriani, the head of the project,
Atop a peak in the Apuane Mountains, the range between the Arno and the Po rivers, Italy, 1974
pointed out that there was a law in Italy to the effect that if your employer paid you too much in error, you didn’t have to pay it back, so I let things ferment. They said they knew I would pay it back because I was a good man. I declared I would, once the whole tax fiasco had been figured out. That didn’t happen until the day before I left Italy.

I had been meant to go to Italy for a year. That time came and went. After awhile, IBM noticed and began to send me angry letters, but everyone knew the Italian mail system didn’t work, so I ignored them. Our work in Pisa was at a critical stage and, as far as I was concerned, much too interesting to leave right then. Eventually, IBM headquarters wrote a nasty letter to the director of the Center, saying that I was to return to Yorktown Heights immediately.

The director of the center in Italy didn’t much like the tone of the letters arriving from New York.

“You know,” he said to me, “we’ve been thinking.”

“It really sounds as though you’re in deep trouble, so we think it would be a good idea if we sent letters to IBM explaining how important your work here is.”

“Well,” I agreed, “it certainly couldn’t hurt because you’re right, they don’t sound very happy.”

“Why don’t you write the letters,” he suggested, “and we’ll sign them. Your English is so much better than ours.”

They were as good as their word and sent letters and telegrams, all written by me, attesting to the importance of my completing the project in Italy. I made it sound as though the Common Market would fall if I left Pisa. The letters were signed by “Head, IBM Italy,” “Head, IBM World Trade, Paris,” and dozens of others, none of whom I had ever heard of, let alone met.
Climbing in the Needles
I hosted a farewell party on a Friday night, at the end of which Giovanna, the lovely, English-speaking Administrative Assistant, read a telegram to the effect that my stay in Italy had been extended to December 23rd. Well, who’s going to go back the day before Christmas? You have to be kidding. They had extended my stay, but they hadn’t told me not to come back, so I flew home. My boss, who knew me well, was on vacation the day I returned to Yorktown Heights, so I went to the new Department Director, who had been appointed in my absence.

“I know nothing about this,” he said. “I’ve only been here two weeks, so you’ll have to talk to my predecessor.” When I did so, he told me that he wasn’t allowed to discuss the matter with me because he was no longer the Department Director.

When no one would talk to me, I went to see Ralph Gomery, the Head of Research, who is famous for inventing integer programming. The secretary wouldn’t announce me because I didn’t have an appointment, so I was sitting outside Gomery’s office when he came out for lunch.

“Jim,” he said, “what are you doing here?”

“Well, it’s a long story.”

He told me he didn’t have much time and invited me to have lunch with him in the cafeteria. On the way out, Ralph found an admin assistant, and the three of us went down to have lunch. I was telling them what I was doing in Italy, when Ralph lifted his hand in the classic stop sign and said, “Jim, why don’t you go back to Italy. Just try to wind things up and do it as quickly as possible.” So I went back to Italy.

Italy spelled the end of my rocky marriage to Kathy. I met Lois a few months after I returned from Europe, when I went up to the Gunks in New Paltz, New York, and ran into a friend who was climbing with three women.
“I don’t have any,” I said to him, “why don’t you give me one of them?”

“Well, as a matter of fact,” he answered, “there is one who wants to go on more difficult climbs. Why don’t you take her?”

So I said I would, and it turned out to be Lois.

She was living in Manhattan when I met her and I couldn’t stand the city, so we bought a little place in Peekskill, New York. I have a picture of that little house in winter, with Lois standing out front.

Every year while I was at IBM in Yorktown Heights I used my vacation to drive out west and climb with friends. We always stopped at Devil’s Tower in Wyoming to do a couple of routes, then moved on. On one visit, the ranger at Devil’s Tower advised us to start very early because the previous day they had rescued a climbing party suffering from heat prostration. We didn’t own a clock among the four of us, not even a wrist watch. I don’t sleep very much anyway, so I woke the others up at God knows what time. It was still dark.

We dressed and went to the mountain, going around to the north face where the climbs are much more difficult. By the time we were on the second pitch, it was light enough for the tourists to be out. The acoustics are such that the sound just floats up the cliff, so you can hear every word people say.

“Oh, look Charlie,” I heard a woman remark, “there are climbers up there. And, oh my goodness, one of them’s got white hair. He’s old enough to know better.”

(left) Lois at Bon Echo, a provincial park in Ontario
At an award party, wearing the gold IBM Outstanding Contribution pin
When I finally returned to the States there was a move on to clean the house of its wild ducks. Some of the wild duck projects were very strange, so much so that it was difficult to pinpoint the objective, let alone how they would ever accomplish the task. IBM put a hard-nosed physicist in charge, and he gathered all the wild ducks into one department called Environmental Science. I found myself with a wonderfully smart and helpful new manager named Betty, who had a Ph.D. in statistics. When I asked her how long she had harbored the burning desire to be my manager, she explained that the department head had assigned her the job the day before my return from Italy. She added that it was not an assignment she would have chosen.

Betty was very worried that I would upset the new man in charge of cleaning house, so she came with me when I went for my interview. I was the last person in the department to be seen.

“Tell me in two minutes or less,” he said by way of an introduction, “what you’re doing, why you’re doing it, and why it’s important for IBM.”

I turned to Betty and asked if he was kidding.

He said he realized I wasn’t doing anything relevant to IBM; what was important was whether I was doing “good science.” When I asked what “good science” was, he defined it as the sort of work that would win a Nobel Prize for environmental science.

When he expanded the definition to include publishing in the best journals and being on National Academy of Sciences committees, he was defining a space where I
Lois and me at a restaurant in Mexico City

Our first house in Peekskill, New York
lived, so that was the end of that! The project came out way ahead in its review, and they granted an increase in head count of three more researchers to our little group. I received three Outstanding Contribution Awards while I was at IBM.

I worked on a number of projects during my time there, but three in particular, including the climax forest, stirred a lot of excitement. The results of those are now widely accepted as being correct.

One of the other important pieces of work involved the watershed model. Computers had just come in and hydrologists had started to use them, when a fellow named Norman Crawford completed his Ph.D. at Stanford on what was called the Stanford Watershed Model. The theory held that you could build a mathematical model capable of tracing a drop of rain from the time it fell on the land until it created a flood at the mouth of the Mississippi. Crawford’s was the first model, and it worked reasonably well.

In this model, the input—rainfall—and the output—stream flow—are coupled with other parameters, such as soil depth and distinguishing characteristics, the kinds of growth in the area and the time of year. I told IBM I wanted to try to figure out how to calibrate these models.

The problem I encountered was that even the best of calibrated models didn’t reproduce the observed statistical properties of stream flow that we needed for water resource design. To obtain statistically significant estimates of the parameters of rainfall-runoff models, you needed very long records of precipitation, temperature and stream flow, statistics that exist in very few places, and almost never where they are needed for water resource design. The Harvard Water Program had side-stepped the issue by using a lag one Markov model to generate synthetic sequences. I found
With Lois
that these models could reproduce most of the necessary statistics, but not the critical storage parameters necessary for successful water resource projects.

Sam Smart pointed out that I was sounding a lot like B.B. Mandelbrot, one of the founders of fractal geometry. Mandelbrot had escaped from Poland before the Nazis invaded, and lived in France for the duration of the war. During that time he couldn’t apply to university because the requisite birth certificate would have shown him to be Jewish. That wartime experience evidently left him incredibly paranoid.

By the 1960s, Mandelbrot was working at IBM Research, and in 1968 we collaborated for six weeks. The result was a series of papers on the use of fractals (although they weren’t called that then) in water resources research. The papers, which represented the first use of the concept of fractals, created a real hullabaloo. Now fractals are used throughout the field of geophysics to model many phenomena.

Our collaboration was fruitful until it came time to write up our findings. At that point, Mandelbrot brought in a New York lawyer, who drew up a contract for me to sign defining what I could and couldn’t do as co-author. I had to promise, among other bizarre conditions, that I wouldn’t publish a paperback version of the book in Taiwan unless Mandelbrot’s name was included. Clauses like this boggled my mind and the mind of everyone else who saw the contract. Why Taiwan? When I showed the contract to the head of Physical Sciences, he remarked that he had seen ghost writers walk away with better contracts than this.

Sam Smart had warned me from the start that Mandelbrot was paranoid, adding that other joint projects involving him had all ended in disaster. As a result, Sam asked me to put everything in writing, and requested that I send him weekly reports.

As a result of Mandelbrot’s paranoia, the book foundered and our relationship suffered. The problem was that we still needed to write up the material, and
I spent several months producing papers with Mandelbrot while we weren’t really on speaking terms. It was a most unpleasant time. When the big bust-up came, Mandelbrot concocted all kinds of fairy tales as to what had happened. The head of the Math Department, where Mandelbrot worked, wanted my side of the story because he suspected that what he had been told was probably a bit one-sided. He would tell me something Mandelbrot had said, and I would counter with “No, that’s not what happened,” and pull out the memos I had written to Sam. In the end, Mandelbrot’s management group sided with me, my management group sided with me and the book project foundered. We wrote up the papers and ceased working together. IBM gave us an award for having done the work, but Mandelbrot and I haven’t had reason to speak to each other since.

That was my first IBM project that attracted notice, and people certainly did notice it. Years (like twenty years) later I was in Brazil, giving a lecture that had nothing to do with fractals. Mine was the last talk of the evening before we broke for drinks. During the question and answer session following my talk, a blonde woman was asking questions that clearly showed a good grasp of the subject matter. At the cocktail reception, she introduced herself and her husband.

His opening remark to me was, “I hate you, and I’ve hated you all my life.”

I’d never seen him before.

It turned out that he was a Ph.D. student of Eagleson’s at MIT when Mandelbrot and I published our papers. The mathematics was obscure, and Eagleson had instructed this fellow to find out what the papers were all about and present a seminar to the group.

“I’ve still got those papers, with all my notes,” he said. “It was a terrible experience, and I’ve hated you ever since.”
Cooking with Lois at home in Norwalk, Connecticut
The work with Mandelbrot showed the over-riding importance of long-term persistence to hydrologic structures with design lives of fifty years or longer. Our FBM models proved intractable, and were replaced by ARMA models documented by Enda O’Connell in his dissertation. Like Allan Freeze before him, the critical work that made both of them so well-known in hydrologic circles was accomplished while attached to our little environmental group at IBM Research in Yorktown Heights.

The third major project connected with my time at IBM—how to best estimate the probabilities of extreme geophysical events such as landslides, floods or droughts—took me twenty years to work out. When I finally had the answer, it all seemed so trivial that I wondered why on earth the solution had taken so long to find. The problem was that until we had computers, it was physically impossible to ask the right questions. Instead of focusing on plotting positions and determining which distribution fitted a small sample of data the best, we were able to ask and answer the fundamental question, e.g., which method provided the most robust estimate of the probability of some rare event. Monte Carlo studies conducted on the computer suggested that all at-site estimates were useless, and that the only hope was regionalization. We invented a new fitting method for distributions called Probability Weighted Moments, or PWM.

In 1981 and 1982, I showed that this method could be regionalized, and, again by Monte Carlo simulation studies, that the probability estimates obtained were much more reliable than could be obtained using any of the pre-existing methods.

I had begun this quest at an AGU meeting in San Jose, when the USGS hydrologist Dave Doherty asked me what on earth was going on with all the California flood stream
At the Henley Regatta
sequences, which were all highly skewed with values of three and four. The records are very short, and the stream value distribution that everyone was using at the time was the Extreme Value Type I distribution, what is now known as the Gumbel Distribution.

“The rivers know the theory; it just remains to convince the engineers,” was Gumbel’s famous quote.

As far as engineers were concerned, the trouble was that the distribution he was advocating has a skew coefficient of 1.14: no one was getting estimates below this value, but they were getting all kinds of values above it. The data didn’t match Gumbel’s theoretical model, and the engineers didn’t use his model because it didn’t represent their reality. The problem was they didn’t know what to substitute, so they concentrated on fitting methods, plotting positions and other distributions. We were trying to estimate the probability of something like the hundred-year flood or the five-hundred year flood from twenty years of data. It turns out that whatever distribution you fit with such short records, it is going to fit more or less equally as well. None of them is likely to give you anything close to a useful or precise answer.

With computers, we could turn the whole thing on its head and say, well, given these sets of data, what is the optimum way to fit the data in order to minimize the error for hundred-year or five hundred-year flood estimates? You could do that with real data if you had a five-hundred-year record, but nobody has that. It turns out that if you try to fit a distribution to the data you have, it just doesn’t work because samples are so variable. You need to know what method of fitting a distribution to data will give you the minimum variability for the quantile of interest.

Graphically, if you take all these points from a site and plot them from smallest to largest on a piece of probability paper, you get an upwards sloping line. The values
The four of us at home in Vermont. We trained the two British Labrador Retrievers, Elfie (right) and Nemo, for work with the blind, and were lucky enough to get them both back as pets.
become greater as the probability that the event will occur becomes less and less.

Now you have to fit a curve to this. How do you do that when you have two non-linear scales? It’s very difficult to do by eye, but when you try doing it mathematically, you find that the variability of your estimate depends on the arbitrary choices of fitting method and distribution. However, you can answer this question through computer sampling, because you can do it a hundred thousand times. You couldn’t live long enough to do the same thing by hand. Using all the distributions researchers had suggested, it turned out that the answer was none of the above. None of them was appropriate. The sample statistics overlapped each other by so much that it was impossible to determine which might be the correct distribution.

There are three possible explanations for that, one of which is that the data are non-stationary, i.e., changing in time. That’s not something an engineer wants to hear. That concept implies that there isn’t any point in measuring stream flow or estimating wind speeds on buildings. If the data aren’t stationary, anything can happen in the future. None of the existing data are of any use in predicting the likely stresses on a building or the height you need to build a levee to stop it from being overtopped. People are going to build anyway, and you have to have some kind of estimate, but non-stationarity is not a useful answer for design purposes,

The second explanation is to ask whether this is a single or a mixed distribution. Say we have two possible generating mechanisms for floods. Maybe they result from hurricanes, or maybe they result from snow melt. In California, you get widely different distributions, depending upon the time of year the annual flood occurs. The big annual flood in the Sierras nearly always occurs in May, when the snow melts in the mountains, but the biggest floods of all time have occurred in December or January, when Pacific storms follow on two or three previous storms that have
Dr. Jared L. Cohon  
Dean, Yale University  
Yale University  
208234 Yale Station  
New Haven, Connecticut 06520-8234

Dear Dr. Cohon:

I am writing you in support of the appointment of Dr. James Wallis to the Yale faculty. Dr. Wallis’ work in hydrology is well known to you and his reputation well established, so I do not need to add support for his credentials except to say that his early papers with Mandelbrot helped me frame my early thinking on climate change issues as part of the Corps contribution to the United Nations Intergovernmental Panel on Climate Change. His numerous papers have always been a refreshing source of insight to my work and invariably has caused me to rethink my assumptions about what we do and how we do it.

I do want to make you familiar with work Dr. Wallis carried out with us recently on a matter of great practical significance, and that is the National Drought Atlas. In 1989, the year after droughts had caused tow boat groundings on the Mississippi, the Institute for Water Resources was asked by Congress to conduct a multi-year study of how Americans could better respond to droughts (reports enclosed). One of the conclusions we came to after a first year survey was that assessments of the risk that droughts posed tended to be relatively primitive compared to the assessments of flood risks. The primary reason for this was that drought planners generally did not have the ability or the data to develop a sound statistical profile of droughts in their region. Instead, in almost all cases, planners formulated their options for a recurrence of the drought of record, with no understanding of how rare that event was, or what the odds of a more severe or prolonged a drought were.

Dr. Wallis and Dr. Jonathan Hosking, both at IBM’s Thomas J. Watson Research Center, had just begun publishing papers on a new method of determining how well relatively small samples of data fit to a population distribution. This new method used linear moments and was particularly well suited to droughts, since there cannot be many severe 5 year droughts in even a 100 year period of record. Wallis and Hosking agreed to work with us to develop estimates of the frequency and severity of droughts (in terms of precipitation) of up to five years duration.
deposited snow. A big, warm storm comes in, melts all the snow that has accumulated and you have a giant flood. That’s a mixed distribution, and there are two generating processes making up the annual observed sequences. Such a situation could give you the sort of results we were seeing.

A third explanation would be that annual floods were distributed in a way not yet specified.

We published a paper, “Regional Skew in Search of a Parent,” in which we asserted that none of the previous suggestions put forward by scientists in an attempt to answer these probability questions was adequate. A single distribution is preferable because multiple distributions introduce extra complications, while non-stationarity questions the validity of using past records to estimate future probabilities.

Professor Thomas, the brains of the original Harvard Water Program, sent me a letter outlining a new five parameter distribution that he suggested might give samples that looked like the observed data. I checked it out, and it did. At that point the game became more interesting. Now we had a distribution generating samples that looked like samples of real data, but how do we reverse the process? Given a sample of data, what are the specific values of the parameters that would produce such samples? There are some distributions, known as inverse distributions, for which the method of moments or maximum likelihood estimation do not work. Unfortunately, Thomas’s new distribution fell into that category. A new distributional fitting method was needed. With the help of J. Arthur Greenwood, whom I had met the year before at an Austrian statistical symposium, we invented a way of fitting Thomas’s new distribution, a method we called Probability Weighted Moments or PWM. We named the distribution the Wakeby because Thomas’s letter had came from Cape Cod, where he summered on Wakeby Pond.
throughout the contiguous 48 states. They also developed estimates of the frequency and departure from normal for streamflows of up to one year duration for hundreds of unregulated streams throughout the U.S.

When we first began, we faced some resistance within the Corps of Engineers because of the difficulty of this task and the novelty of the use of linear moments. Dr. Wallis's reputation, hard work and cogent explanations were all helpful in establishing confidence in this approach. I consider the National Drought Atlas to be a very valuable intellectual "first" for the Corps - not to mention its practicality and usefulness to the average field planner and hydrologist. Dr. Wallis was instrumental in helping us "sell" the practical aspects of the approach. His natural curiosity has since led him to use the Atlas distributions to estimate the recurrence intervals of the floods that occurred in Arizona (1992-1993) and on the Mississippi-Missouri in 1993.

As I have said, Dr. Wallis has a reputation in hydrologic research far beyond my ability to burnish, but I can also attest to the commitment and hard work he brought to bear on a very practical problem. I look forward to working with him some day again. If you would like to contact me to discuss this further, I can be reached at 703-428-6370. We will be meeting soon enough at the BICE meeting on June 5, 1996. Looking forward to seeing you then.

Sincerely,

Eugene Stakhiv
Chief, Policy and Special
Studies Division

Enclosures
We found that PWMs could be used to fit many distributions, both normal and inverse, and that the method was “robust.” PWMs also exhibited extremely good small sample properties, and avoided the problems that one can encounter with maximum likelihood or the method of moments.

Statisticians chose to ignore this major breakthrough because we didn’t publish our conclusions in a statistical journal. It took statisticians a while to wake up to what we were doing. The concepts are really quite simple. When we first fit the distribution and worked out the algebra, it took us three days. I was only sure we were on the right track when I wrote a computer program that generated numbers, and I was able to fit those numbers back to see whether they gave me the distribution parameters I had started with. Then, and only then, did I believe we had our math right.

As far as I know, only one person ever checked the algebra and that was Thomas. He said it took him days. There is a standard joke to the effect that when you write up a complex algorithm, you give the first equation and the solution, followed by something like, “It is immediately apparent to the alert student …” This allows you to leave out fifty lines of algebra and three days of work.

This kind of work has very real consequences. My explanation may seem a bit obtuse, but there are very practical reasons for finding answers as close to the truth as possible. When they built the John Hancock building in Boston, plate glass windows came crashing down because they hadn’t calculated the wind pressures correctly. They hadn’t made correct allowances for the extremes.

It is the same with floods. The Ponte Vecchio in Florence was built after the flood of 1366, the third bridge to occupy that site. Every time, they built the new bridge, they built it bigger and higher and stronger. The Ponte Vecchio withstood the flood of 1966, but only just.
My IBM retirement party at the Stamford Yacht Club, 1996
We are with Hal and Alison and their children, our Godchildren, Teddy and Libby
It was a requirement that your manager at IBM had to be present at a company-sponsored retirement party, but as I did not care for either of my current managers, I refused to comply. IBM solved this by appointing Jon Hosking—colleague, friend and co-author—as my manager for the day. That allowed IBM to sponsor the event.
Then there is le Pont d’Avignon, a bridge that stretches halfway across the Rhône River. Floods destroyed the bridge so often that they stopped trying to rebuild a bridge that would cross the river. Only with the advent of suspension cables were they able to create a long enough span to survive the next big flood.

This is the history of engineering. It’s very expensive to lose these structures, not to mention the fact that people are likely to be killed when a bridge or a building fails. What I’m saying here may seem obscure, but it is of great major practical importance throughout engineering design.

The next step in this progression occurred while I was on sabbatical at the Institute of Hydrology in the United Kingdom. The British Flood Studies Report, FSR, was in trouble, and the Director of the Institute, thinking I might be able to help, invited me over to England. It was there that I met and first worked with Jon Hosking. Ultimately, Jon came up with the idea that PWMs could be related to order statistics and a set of linear moments. As a result, the regional PWM-WAK algorithm has now been replaced worldwide by the Regional L-Moment algorithm, which is numerically equivalent and is much easier to use and understand. It has been used in the British Flood Estimation Handbook, successor to the FSR; it has been used in the U.S. and CAZALAC domains for drought probability studies; for short duration, maximum precipitation probability from Canada to California; and in a plethora of other places and disciplines.

In the end, IBM was losing money and shedding people left and right. The thirty-year-old they put in charge of the Mathematics Department told me directly that I wasn’t doing anything useful, and, in his opinion, never had. I walked out.

When I phoned the head of Personnel to ask whether IBM still had the
(left to right) Lillian Woo; Jon Hosking; me; and Betty Flehinger, my excellent manager at IBM
arrangement that linked people leaving IBM with university teaching positions, he said no, they didn’t, but for me they would make an exception.

I refused to have an IBM-sponsored retirement party because we would have had to invite my current managers, none of whom I liked. Instead, Lois hired a room at the Stamford Yacht Club, and we invited a small, select group of friends to dinner, including Jonathan Hosking, who had followed me into IBM Research in 1986. He presented me with a volume of our joint papers, which went against my dictum of no presents, but was much appreciated. To its credit, IBM appointed Jon as my “manager for the day” in order to allow them to pay for the event.

Jared Cohon, the Dean of the Forestry and Environmental Studies Program (FES) at Yale, recruited me and others into the school in an effort to introduce some mathematical rigor. Six months after I started at Yale, Carnegie Mellon offered Cohon the presidency. Once he left, the tenured faculty, who ran the school by committee, handed walking papers to everyone Cohon had hired. I had a three-year contract; when that expired, my contract was not renewed.

As luck would have it, the Yale Engineering School asked me to join them. I went on to teach Introduction to Hydrology and Water Resources until December 2010.

Life is full of choices and decisions. I have few regrets, and life is still interesting and fun. Looking back, the reasons for many of the choices I made seem obscure, but, as Rod Swartz said one moonlit night in answer to an admitting officer at the Poughkeepsie Hospital, who had asked why you were climbing on the Gunks at two in the morning, “It seemed like a good idea at the time.”
Two happy souls at my retirement from IBM
Dear Dr. Wallis,

Thank you for your presentation on the Colorado River Compact to the Western Resources Student Interest Group (Westres) at the Yale School of Forestry and Environmental Studies. We thought the presentation was excellent—concise, factual, and fun. It would certainly have been difficult to understand the Compact without understanding the history of the river and the problems associated with it. Despite the time constraints, you offered us a lot to think about!!

We really appreciate your visit and wish to thank you for sharing your knowledge, insights, and time with us. Thanks so much!

Sincerely,

Westres
Morgan and Heather
Co-Presidents
On August 10, 2010, former student Adam Schempp sent me his opus on reconciling water conservation with the western water doctrine of prior appropriations. It is a very useful analysis of what works and why for the twelve western states, and how policies have been modified to allow for water conservation in states that use the law of prior appropriation. It is a very useful book. These are the things that make it all worthwhile!
With Kevan in Palo Alto. I went to Kevan’s successful Ph.D. defense at Stanford, where she discharged all aspects of the career path I had laid out for her ten years earlier. Lois made Kevan an apron with the logo, “I don’t need a recipe, I have a Ph.D.”
Certificate of Recognition

This certifies that

Dr. James R Wallis

has been nominated
BEST MENTOR
at the Yale School of Forestry and
Environmental Studies
for unfailing generosity with his time,
wisdom and knowledge.

[Signature]
5/24/99