

# MORE THAN A MEMOIR

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*For Caltech, with appreciation.  
Nelson J. Leonard*

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## *Dedication*

To the four women in my life:

My mother, Olga

My daughter, Marcia

My wife, Louise (Nell) Vermey  
and

My wife, Peggy



## *Preface*

This autobiography was written originally as a test of memory, as a means of diminishing piles of stored papers and file folders, and in an effort to record events as they actually happened. It had been my experience as a child, hearing oral histories presented by adult family members, that there was great variance in their perceptions. Perhaps I could set down the “facts” of a life and leave interpretations up to any readers.

Each of the chapters was distributed to my four children, Kenneth, Marcia, James and David. Inasmuch as they read the sporadic mailings, I incorporated their corrections and tried to answer any questions they raised. I relied upon friends to check specific chapters against their memories and upon Peggy Phelps to offer penetrating criticism where she discerned opinion masquerading as fact. Diane Orona deciphered my handwriting sufficiently to produce a handsome, typed manuscript, and I thank her for her patience and her aim at perfection.

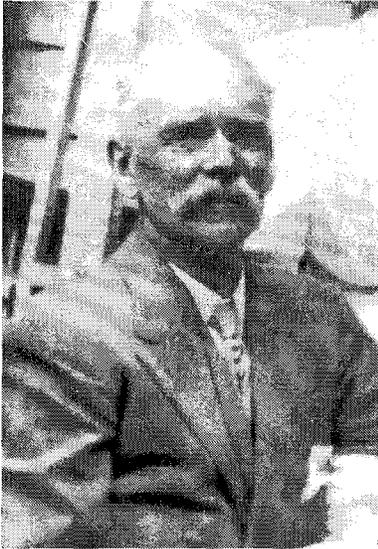
Who will read such a manuscript? Who among the grandchildren or children has the time for it? With the completion of the story, can I hope that others may find it of interest? The very personal nature may decide against that. The diverse nature of the subject matter would guide toward selective readings: organic chemistry with some biochemistry and plant physiology; music, but mainly singing; bi-continental living and romance; family; travel; universities; extraneous material about foundations, research support, national and international organizations, even some talks (in the appendix). However, there is a whole to it—the story of a sample life in the twentieth century and a bit into the twenty-first. I have found life’s journey exciting and rewarding. I have been fantastically lucky.

NJL



## MY PARENTS

**M**y father, Harvey Nelson Leonard (1877-1949), born in Buffalo, New York, was the son of William Nelson Leonard (1848-1915) and Julia Angeline Reynolds (1851-1935). His parents, whose ancestors had come from England in the first half of the seventeenth century, also had two daughters, Flora and Kate, who were born in 1871 and 1874, respectively. My mother, Olga Pauline Jordan (1882-1958), born in Hoboken, New Jersey, was the daughter of Caroline Klein and Henry W. Jordan, whose dates are less certain. Their forebears were Huguenots, who left France for Germany in late eighteenth century and sailed to the United States in mid nineteenth century. Olga was the oldest of four children, and she had some responsibility for the younger three: Henry, Louis, and Emma. Nevertheless, she was able to finish high school. She played the piano and could play the organ, while Henry played the cello. There was always music in their home.



Grandfather, William Nelson Leonard



Grandmother, Julia Angeline Reynolds

My father was unable to finish high school because he had to aid in the support of his two older sisters. I gather that his father William was not a very successful breadwinner, although he was adored by the family. My father, Harvey, went to work in a bicycle shop in New York City when he was fourteen. His stories of that time had an heroic quality, e.g., how he used to be able to lead two bicycles along for delivery, steering his own bicycle as necessary with his feet, and how he was fortuitously saved from being trampled when he, riding south on Broadway and turning east on 42<sup>nd</sup> Street, collided with a horse-drawn tram, coming north on Broadway and also turning east on 42<sup>nd</sup> Street. The triangular frame of his bicycle was caught on the whiffletree and lifted safely between the two horses. He helped to construct a bicycle built for six, for the Flora Dora Sextet, who were a Broadway act. He obviously enjoyed his bicycle days, and he was mechanically inclined. It was his parents' desire, however, that he should become a white-collar worker, quite possibly with an improved salary. Accordingly, he became a salesman of men's clothing and worked for many years for F.R. Tripler, an upscale store in New York City. My mother held the opinion that if he had stayed in the bicycle shop, he could have made the transition to automobiles and could have enjoyed a more interesting and profitable occupation. Nevertheless, my father adapted well to the retail trade and developed a large and loyal following of customers—friends, he called them.



Father, Harvey Nelson Leonard



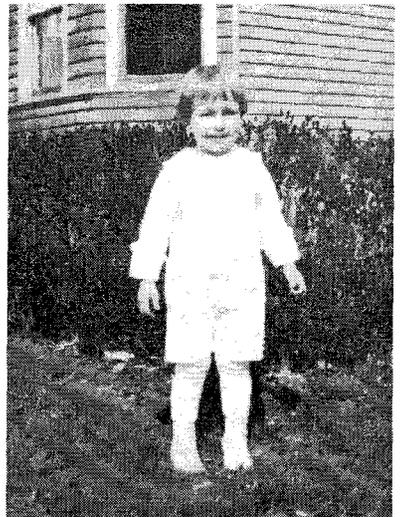
Mother, Olga Pauline Jordan

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The first meeting of Olga and Harvey took place in Red Bank, New Jersey. It happened this way, according to my mother. She was visiting Carrie Mount, who was her sister-in-law, the sister of Ralph Mount, whom Emma had married. A Mr. Canfield, a sometime suitor of Carrie, was also coming for the weekend and was bringing along his friend, Harvey Leonard. The Mount house stood by itself with a clear view of the street (I visited there as a small boy) that led from the railway station. Olga spotted the two men walking from the station shortly after the scheduled time of arrival of their train from the City. It seems to have been a case of “love at first sight.” Olga was about five feet, five inches tall. The dapper Harvey came striding along, six feet, one inch tall, sporting a cap and a handlebar moustache, and carrying his suitcase on his shoulder. Olga needed coaxing from Carrie to come downstairs to meet the new visitor. Family history does not record how long it took for shyness to give way to interest and affection, but that happened. In the first decade of the 20<sup>th</sup> century, it is also not clear how young people ever advanced to the engagement stage, especially when they came from “proper” families like the Jordans and the Leonards. Most contacts were made at weekend visits with friends or family members, or at church, or at “house parties,” where married chaperones were present. Flora and Kate were not initially receptive to the



NJL, fourteen weeks



NJL, two years, seven months

idea of a sister-in-law, but the financial implication was relieved somewhat by the marriage of Kate to George T. Macbeth. He was a gas engineer

from South Carolina, who had been educated most recently at Temple University and who had been hired by the Westchester Lighting Company, with its main office in Mount Vernon, New York, where the Leonard family lived. Olga and Harvey were married on August 19, 1911, with Emma Mount as matron-of-honor and George Macbeth as best man. The couple honeymooned at Glen Falls, Watkins Glen, in upstate New York, and they started life together in Arlington, New Jersey, north of Newark.

In September, 1913, they had a son, Harvey, Jr., but he survived only one month. It was not until September 1, 1916, that their second son, namely Nelson, was born in the Presbyterian Hospital, Newark, New Jersey. I frightened them with a milder form of colic than my predecessor had, but I survived and grew. In 1918, the family recovered from another scare when my mother and I both had the influenza that was sweeping the world at the close of the first World War. Somehow, I felt assured that my parents, ever attentive, would always take care of me. I was allowed to be outside the house alone, and I was supposed to stay on the sidewalk in the small block on which we lived. If someone was concerned about my being lost, I was to recite, "I live at two two two Brighton Avenue." We moved to Mount Vernon, New York, on the north side, when I was two and one-half years old in order to be closer to my paternal grandmother and to give my father an easier commute to his place of work in the City.



NJL, four years

My maternal grandfather moved in with us when he became a widower, and my mother, as the older daughter, assumed responsibility for him until he died. My memory of Henry Jordan is that of an amicable man with a moustache who used to read to me as I sat on his lap. We moved to the south side of Mount Vernon when I was four, and from that time forward we lived never more than one block away from the house in which Grandmother Julia, Aunt Flora, Aunt Kate, and Uncle George lived. I grew up surrounded by adults, all of whom offered advice and discipline, and all of whom "spoiled" me to some extent. There were, however, plenty of children my age in the neighborhood, and there was a growing contingent of cousins with whom I could spend holidays (Louis' and also Emma's children).

My parents never owned a house, never owned a car. Trolley car stops were two blocks from the house. One route would take us to the head of the subway line in the Bronx at 241<sup>st</sup> Street and White Plains Road on the Lexington Avenue line. The other route would take us to Pelham, New Rochelle, and the beaches on Long Island Sound (with one transfer for an extra five cents). A station on an electrified railroad line ambitiously named the New York, Westchester, and Boston Railway, was about five blocks away. The railroad was never extended beyond 139<sup>th</sup> Street in the Bronx going south and beyond White Plains going north. Six days a week, my father walked to and from the Mount Vernon station of the New York, New Haven, and Hartford Railroad (about 12 minutes), on which he commuted to the Grand Central Station at 42<sup>nd</sup> Street (about 24 minutes). There were small food stores, a drugstore, dry cleaner, and a fresh fish store two blocks away from our house and the major shopping avenue stretched between three to five blocks away. My mother shopped frequently because we had only a small ice box at the first addresses we occupied. I went along as a carrier when needed and with my little express wagon for bigger shoppings on Saturday. All of the schools I attended in Mount Vernon were within walking distance—elementary, middle school, junior high school, and high school. They were good schools with excellent teachers, and my mother was active in the PTA (Parent-Teachers Association).

We did not suffer from the lack of a car because of the efficient public transportation. Moreover, the houses in which we lived did not have any space for a garage. It was customary for us to take family walks, especially on Sunday afternoons or on holidays, although occasionally friends or relatives with an automobile would take us for an afternoon ride. While this was a treat for my parents, it was never a treat for me because I suffered from motion sickness. In my Uncle George's seven-passenger Franklin, I usually sat on one of the jump seats with my nose poking through a small window opening. In addition to walking around Mount Vernon, it was a custom to take a trolley car to the end of the line and then walk from there in the more open spaces. Dad always walked briskly, swinging his cane.

In the years when I was growing up, the churches were a major source of social life as well as spiritual guidance. The rented house in which I lived from the age of about four was adjacent to Trinity Episcopal Church. My father went to an early communion service on Sunday and was then free to work in his basement shop or to do various house repairs. My mother went to a later service and then came home to finish preparing Sunday dinner, customarily a feast. She was in the Women's Guild and in

some club which seemed to be devoted mainly to the playing of bridge. My father was in the Men's Club, which boasted, although not too loudly, of having one billiard table and two pool tables in their basement clubroom. I thought that room was a kind of "heaven," for I was allowed to come and watch the proceedings as long as I could sit absolutely still. It is enigmatic that a pool hall was considered an acceptable place for a child because it was in a parish house. My father was a skilled pool player and, when I was considered old enough, my patient teacher. Adult dances were held regularly in the parish house, plays were performed, and musicals and operettas were produced. All this was in addition to the special choir music that one could hear on Sunday evenings. A gymnasium with an almost-regulation basketball court was available to the young people of the church and for Boy Scout and Girl Scout meetings. The Boy's Choir, which I joined, rehearsed on Wednesday and Friday afternoons in a small room adjacent to the gym. When the combination of strong discipline and repressed energy became too explosive, we were released into the gym for a brief intermission. The phenomenon of church-centered social life that was pervasive in the 1920s can still be found in selected regions of the country and in certain churches, but other opportunities and diversions now abound.

What other social life did my parents have? It was mild, I can assure you. It was a custom for them to join friends, other married couples—perhaps three of them—for an evening of cards and dessert. I remember being taken to Aunt Flora's to stay overnight when, on a Saturday, my parents would be "going out to play cards." When it became my parents' turn to be the hosts, I probably made a nuisance of myself. After being put to bed, I would sneak down and sit silently on the stairs, trying to absorb the scene, if not to be a part of it. Someone would discover my presence, and I would have to retreat quickly. The process would be repeated until no one found it amusing. Bribery with a small dessert would end the incursions when tiredness did not. Occasionally, my parents would go out to a movie and, when I was considered old enough, they would take me, but only to films that were either uplifting or funny.

Both parents loved to swim. My mother always did the breast stroke with her head well out of the water. My father liked to float, which he could while remaining remarkably still. I once bet him that he couldn't read a newspaper while floating. I swam out to him, holding a rolled-up paper out of the water and placing it in his hands. To everyone's amusement, there was a gentleman floating and reading a newspaper out in the small bay. My dad was not shy in demonstrating his prowess. On the next swimming outing, I ventured to bet him that he could not read a newspaper *and* smoke a cigar while floating. He agreed to try. Accordingly,

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a friend and I swam out to the floating parent and assisted in placing the lighted cigar in his mouth and the spread newspaper in his hands. Then we swam away. Now, to everyone's amazement, there was a gentleman floating out in the bay, reading a newspaper, *and* smoking a cigar. Wonder of wonders! All of a sudden, the peaceful scene metamorphosed into one of great splashing, coughing, and confusion. With my dad's hands occupied holding the newspaper, as the cigar burned down, there was no place for the cigar ash to go but all over his face. He recognized that the outcome might have been anticipated, but when he swam in following recovery, all he said to me was, "You son of a sea cook!" It was one of his favorite expressions.

There was a time of approximately seven years of my Dad's life when he was in excellent physical shape. Almost every Sunday after early church service, he would hike to Hunter Island in Long Island Sound, which was reached by a small pedestrian bridge from the mainland. The distance he actually walked was about seven miles round trip. The purpose was to take a dip in the Sound at a secluded, rocky spot on the east coast of Hunter Island. When I was about seven, I asked if I could go with him on a warm Sunday—he went the year round. We shortened the walking portion by taking a trolley part way. I enjoyed the excursion and the brief swim, but I did my usual trick of stepping on a piece of broken glass, and I needed bandaging. My variation on that trick was to step on a nail, which I did on several other swimming or clambering occasions. Two Sundays later, I asked to accompany my Dad again. After strong admonitions given by him and earnest promises on my part that I would watch where I was stepping, we made our second joint expedition to Hunter Island. It went very well. My mother, who had been so concerned about my wound on the first occasion that she did not ask me anything about the swimming, made up for her unasked questions with the following (approximate) exchange on the second occasion.

"Which bathing suit did you take?"

"None. You don't need one. I had a towel."

"Did Dad have a bathing suit?"

"No, he had a towel."

"Were there only men swimming there?"

"No, there were women also."

"Well, did anyone have a bathing suit?"

"I don't think so. Dad said they were mainly Swedish people, who liked to swim without anything on."

On the Monday that followed, my father said to me somewhat accusingly, "Son, you sure qucered it for me!" He seemed to lose interest in those

Sunday walks and swims. Some seven or eight years later, we initiated a different practice on Sunday afternoons in the early summer. We would rent a rowboat near Hudson Park, New Rochelle, New York, and row out from shore. My father would try to fish, and I would jump out and swim around nearby. He never did catch anything, but he liked being out on the water and he indulged my whim to swim freely quite far from land. I was reminded of those afternoons in 1942 when I was about to leave New York for my job in Illinois. He questioned me, "Son, how long will you be able to be away from the sound of oarlocks?" It was an old-fashioned statement, but I understood its significance. For my part, the question was answered when Nell and I discovered Dunewood on Lake Michigan (1949). It is still being answered in my present fortunate locations with Peggy on weekends in St. Malo, Oceanside, on the Pacific Ocean, and in Desbarats, Ontario, during the summer.

There were swimming vacations in the summer when I was young, but they were a brief one or two weeks according to my Dad's allotted time off. I recall the locations of Lake Hammersly near Pawling in Dutchess County, New York, and Atlantic Highlands, Sea Bright, and Ocean Grove on the New Jersey coast. My parents enjoyed the Atlantic surf. In those days, there were ropes stretching out into the water that people would hang on and thus prevent their being washed out to sea. The waves appeared huge and threatening in my recollection. My father spent some time fishing when we camped alongside Lake Hammersly, but he was not a very lucky fisherman. At one stage in his life, he went occasionally with his friends on weekend excursions that were billed as deep-sea fishing adventures. The strange thing was that he never brought home any fish or, in fact, any part of a fish. My mother observed, moreover, that he was always very tired when he returned home on the Sunday evening. Those were prohibition years, and our supposition was that fishing was never really an important part of the adventure. The fishing vessel would make for a location outside the twelve-mile limit where it would be legal for a "rum running" ship to deliver whiskey to the "fishermen." Then, overindulgence in reasonable, tax-free liquor combined with the chop of the Atlantic could easily produce the "tiredness" that was so obvious at the end of the weekend.

Dad's other interests included pool, which I have mentioned, flying kites (for my benefit, of course), working in his shop in the basement, and playing checkers with a friend of his, Arthur Babcock. He also liked to ride trains despite the fact that he commuted six days a week. He tried all the little branches of the New York, New Haven, and Hartford Railroad and of the New York Central Railroad that served parts of Westchester

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and Dutchess Counties in those days. These included the Silvermine Branch of the N.Y. Central, which actually terminated at a mine.

If Dad had had engineering training, he might have been an inventor. He could make and repair things. He made a fancy doorbell for the house at 342 South Third Avenue, Mount Vernon. It was made of brass, had a light inside that we could turn on at night and that shone through perforations reading "342". The front of the small brass box was tilted down so that the number could be read without the necessity of coming up the steps onto the front porch. Dad tried to patent the construction, but it was deemed to have been a composite of known materials, as so it was. I have seen some versions of a lighted doorbell with a house number on it, but none so grand as our "342." Summers could be very hot and humid in Mount Vernon, so Dad fixed up an outside cold shower in the grape arbor behind the house. He laid linoleum on the wooden floor of the arbor and constructed two canvas folding side doors that snapped into place, forming a corridor between the back door to the kitchen and the vine-protected shower. Cold showers outdoors before bedtime made it possible for all the family to go to sleep even on the hottest nights. Dad constructed a simple pinball machine for me as a gift when I was about ten years old. That game, made of wood, brass strips, brass nails, bells, sunken chromium pockets for the stainless steel balls, and a spring-loaded releasing device for the balls, remained in the family and was used by our children and the neighbors' children until electronic games came into being!

Dad was fascinated by fires, and I was also, although frightened as well. Mount Vernon had a volunteer fire department that was summoned by a certain pattern of whistles to the site of a fire in the city. There were fire boxes distributed throughout the city and all were numbered. In our section of the city, most of the streets and avenues were numbered. By inspecting the numbers that appeared on the fire boxes (red, with a handle that could be pulled down) and relating these to the street and avenue crossing, I could decipher the code. The number of whistles and the number of pauses between whistles defined the location of the box that had been "pulled." Thus, we could know where the trouble was and whether it was a walk or a bike ride away, or whether it was in another part of town. Nevertheless, I learned that it was not really fun to see someone's house burn and also to worry about where the wind would carry the sparks.

What else did we do together? We went to Coney Island, on—or just off—Long Island. All three of us went the first time, and Dad and I went on subsequent visits to experience the more energetic rides. Steeplechase

Park within Coney Island was named after the mechanical steeplechase ride that circled the outside, high on the building. The riders sat on painted horses that traveled on parallel tracks that went up a high incline to begin with. This provided the potential energy that was then converted to kinetic energy for a fast trip downhill and lots of ups and downs thereafter as the tracks circled the building. It added the factor of a race to the individual roller coaster experience of those riding the parallel horse tracks. My favorite amusement was a high wooden slide with bumps that deposited one onto a flat array of polished wooden disks, with adjacent disks turning in different directions at different speeds. The body took a lot of “to-and-froing” until it was finally pushed off to a side trough that surrounded the square table of rotating disks. I would spend my time on the slide while my Dad liked to sit in a nearby theater with a stage that was actually the exit of a fun house. People would stumble onto the stage, groggy from the experiences of the dark fun house, but feeling that they were finally safe. They were not. A clown equipped with an electric cattle goad would threaten them into position over holes in the stage floor through which sudden blasts of air would raise the skirts of the girls and ladies. Such sexist exploitation and the “shocking” procedures visited on both males and females would probably not be acceptable practice today. I am speaking of 75 years ago. Amusement at the victim’s expense.

Luna Park had a Shoot-the-Shoots, so-called, that was really a short roller coaster ending with a splash into water. Outside these two parks were other amusements that challenged courage. One was a huge ferris wheel in which some of the carriages were fixed and some, when they had reached the apex, would slide down a track as though they would fly beyond the circumference of the wheel. A switch of tracks would bring them back into the interior of the huge wheel. Thrills could also be obtained on a wooden roller coaster called the Thunderbolt that lived up to its name and was one of the tallest of the time.

My father was not always in a good mood. His salesman’s job, always catering to the public, to the customers, often discouraged him. He would do some carpentry work to recover his spirit. When he was in good spirits, he would whistle. Mother and I loved to hear him whistle because he was very good at it. He invented a family whistle that, when he performed it from the front porch, meant that I should come in for dinner. It took only one whistle. Dad was superstitious, as were many of his era. It is not worth reciting some of his concerns, although I find that I unconsciously avoid some of the practices, such as raising an umbrella over your head in the house, placing a pair of shoes on the table, etc., that he was convinced brought bad luck. In later life, he developed ailments that were debilitating.

Varicose veins eventually led to ulcerated sores on his legs that required him to sit at home with his legs elevated. When the legs had healed, he could return to work. Adam Gimbel, who ran Saks Fifth Avenue, provided him with a folding stool that he could sit on when not waiting on a customer. I believe he was the only salesman in the store who had permission to sit or lean during working hours. He used the privilege only as much as necessary. He developed cancer of the prostate. After a prostatectomy, he remained in good health for several years until metastasis to the bones occurred, with its painful, eventually fatal consequence. My mother had a hard time taking care of him in his final half-year, but they arrived at a full and sympathetic understanding of each other during that period. When Nell and I drove from Illinois to Mount Vernon for the 1948 Christmas-New Year vacation in our new Mercury convertible, we organized the christening ceremony for Kenneth to take place in Dad's bedroom, much to his satisfaction. He was relieved to have another male Leonard in the family, the first one of the next generation. He was charmed by Ken's happy nature. When it became time for us to leave in January, I said goodbye and told him that I was praying for him. He asked rather aggressively *what* I was praying. I could sense that his pain was making death a welcome friend, so I answered simply, "For God's will to be done." He appeared relieved, and we parted on that note. He died in March, 1949, at the age of 72. I returned for the simple funeral.

My mother died at 76, so that she had some happy years to be Grammy to all four children. Although she had some nervousness and a tendency to high blood pressure, both were in control at the time of her death, which occurred suddenly during a heart attack. She had been playing bridge with "the girls," all old friends about her age, and was waiting for a bus to take her back to the apartment when she was stricken. I happened to be lecturing at the University of Rochester when my friends there were notified. (The value of a distributed itinerary is indicated.) I was permitted to finish the lecture and to answer questions, after which I was told as gently as possible. There is really no way to soften the blow of the loss of a parent or loved one, however. One moment you don't expect anything, and the next moment you know the worst. Resilience is necessary because death is followed by so many requisite formalities, not the least of which is the arrangement of the funeral and the burial. My parents' bodies occupied the last two graves in a pleasant cemetery in West New York, NJ, where my mothers' parents were buried, also the infant Harvey, Jr.

It was not until two weeks later that I broke down, when Nell and I had started to go through my mother's things in order to clean out her apartment in Mount Vernon. I was unable to act fast enough in deciding

what to do with her few possessions; accordingly, Nell shooed me out of there and made her own decisions quickly and unencumbered, with very good results. Nell and my mother really loved each other and enjoyed each other's sense of humor. In all Mother's visits with us in Urbana, Illinois, and in Manistee, Michigan, she never interfered with the running of the household or with the way we were bringing up our children. She really loved the four children, concocted various forms of mischief with them—as grandparents are supposed to do—read to them, played games, and occasionally cooked some desired specialty. Grandmotherhood was a happy time for her.

My mother had love for everyone. I am unsure as to whether this developed over time and experience or whether she had love in her heart from the beginning. She followed the approximate biblical words, "For now abideth faith, hope, and love, but the greatest of these is love," from the King James version. Her feelings of love were real; they did not prevent her from being full of fun as well. She would have been surprised if someone had doubted the authenticity of her warmth. She had many friends and was always doing something for someone else. I felt her maternal concern and affection, even when I was being punished. I received spankings when I deserved them, accompanied by calming words such as, "I'm doing this for your own good." When the accompaniment changed to "This is hurting my hand more than it is your bottom," we both ended up laughing, and she concluded with "You will just have to behave yourself," making it a matter of pride for me to "toe the mark," which was my father's usual admonition. Forgiveness was always quick.

Mother was usually there when I came home from school in the afternoon, but if she planned to be away, the key was placed under the mat. If this were forgotten, I could climb up the trellis at the end of the front porch, ease myself onto the roof overhang, and enter the house through one of the unlocked bedroom windows that opened onto the roof. She asked for a demonstration as to how I could do this because she questioned that it was really possible. Imagine my surprise when, some weeks later, she arrived home before I did, had forgotten her key, and I found her in the process of climbing the trellis. The overhang would certainly have defeated her. I made her promise not to try it ever again. There was always a snack waiting for me in the kitchen in the afternoon, including milk or homemade root beer that my father used to concoct. When I was in middle school and junior high school, I walked home for lunch because we lived so close to both schools.

All of my friends were welcome to come to the house. There was ample space to play—in the house, in the yard, or in the churchyard next

door. My aunts thought I should be restrictive in my playmates. By contrast, my mother said that anyone I regarded as a friend was welcome, and, furthermore, that she would be very disappointed in me if I were not willing to bring *any* friend home, no matter what his religion, national background, or color. I am sure that my father felt that way as well. They had true democratic instincts. In local politics, they were Republicans, who were in the majority in Mount Vernon. Accordingly, it was in primary contests that most of the candidates were chosen. My mother was the Republican precinct manager; she was most interested in doing a fair and honest job. My father's political slant was more or less derivative of the newspaper he read on his commute home from New York each day, *The World Telegram*. When Roosevelt became President, Dad was appreciative of the Minimum Wage Law and the Social Security Act. I suspect there were some split ballots in the family. Dad's favorite reading material was Arthur Conan Doyle's *Sherlock Holmes*, which he reviewed several times, sharing the stories with me.

There were good books in the house plus *The World Book* for reference. I was given practically every book I asked for—at Christmas or on my birthday—and my mother and I were regular borrowers from the Mount Vernon Public Library. My friends and I took advantage of the library incentives and reading contests (i.e., numbers of books) in the summers. My mother particularly liked to read of the women of history or novels about “wicked” women, as she called them. They must have allowed her an escape from the quiet and good life that she led. She played the piano on request and when she wanted to play and sing some favorite hymn. She tried teaching me to play the piano, but I never got beyond one-finger sight reading. When I finally could carry a tune, she would play accompaniments for me, except when the key had too many sharps. We got to be quite a “team” with practice, particularly for the rendition of lieder and art songs. We regularly sang our rehearsed selections at my grandmother's house on Christmas evening and on Thanksgiving Day, well after dinner. Let me put it this way: we enjoyed it and the family expected it. Mother spent considerable time visiting with her friends, dropping in to cheer up some church member who was ill, and playing bridge with “the girls.” She was a great seamstress and made most of her own dresses. She mended the clothes that my father and I wore until they would mend no more. When I shifted my soloist job from Trinity Episcopal Church, adjacent to our house, to the Chester Hill Methodist Episcopal Church, which was a mile and a half away, Mother lost interest in Trinity Church but would only go across town for special music. She changed allegiance to the First Baptist Church, which was only several blocks away,

was less formal, and was more community-oriented. The minister, the music, and her friends made her feel at home in that church. Among those good friends were Ed Meury's mother and aunt. Reverend Ed Meury, my friend since kindergarten, later performed two important marriages in our family (Nelson and Nell, David and Elena). My father remained content with the early communion service at Trinity, which left him free for the rest of Sunday, and eventually he found he could forego even that early service.

Mother kept in contact with her siblings, especially Emma and Louis. Mother and I would go by train in the summer to stay in Providence, Rhode Island, where Emma and Ralph Mount first lived with their four children: Ralph, Dorothy, Edwin, and Frank. During some summers, we would stay in a cottage that they rented on Narragansett Bay. I have happy memories of those brief periods when I was in the midst of the large family of cousins. Visits to the Jordans in the less exotic location of East Orange, New Jersey, were more frequent and were made exciting to me because of the Delaware, Lackawanna, and Western train ride between Hoboken and East Orange. Cousin Virginia, who is four years younger than I, did not share my early enthusiasm for baseball and toy trains; nevertheless, we grew to appreciate each other and have maintained a close friendship over the intervening years. Uncle Louis had an endearing sense of humor and an investment-level of interest in mint U.S. postage stamps, which, for me, made him intriguing. I was less interested in his celebrated rose-growing ability. Aunt Alice played the piano and would accompany my singing as long as I kept the repertoire to Stephen Foster and semi-classical music. When I visited East Orange, as I did frequently while I was attending Lehigh University in Bethlehem, Pennsylvania, Uncle Louis would always greet me upon my arrival at the house with "Now, when is it that you have to leave?" He was always joking (I think). When I took son Kenneth to meet him for the first time, years later, Uncle Lou convinced Ken that he kept a mouse in his pocket. For many years thereafter, Ken would refer to him as my "uncle who kept a mouse in his pocket."

My parents' humor was seriously tested during the depression years. The rented house we lived in during the 1930s had four bedrooms, an attic bedroom, and one bath in addition to the living room, dining room, and kitchen. I had a small desk in the corner of the dining room where I did my homework. Through 1929, a "roomer" occupied one of the second floor bedrooms. After 1929, Dad was unemployed for lengthy periods. Accordingly, a number of economic adjustments had to be made. We added another "roomer" and then a "boarder," who took breakfast and dinner

with us. I was moved from the second floor bedroom to the third floor bedroom and then to the adjacent attic bedroom. Mother put her sewing ability to good use and made dresses for her friends, especially the unmarried school teachers. She put her baking skills to use. I would deliver her luscious, home-made coffee cakes on Saturday night or Sunday morning to neighbors on our block. Because of her maturity and experience, she became a favored babysitter. I delivered groceries and sold magazines. I no longer received an allowance, but I was paid for chores at my home and at my grandmother's house. I was allowed to bank my pay for singing in the choir. My father, when he was not employed in New York, "took to the road." He and his friend, Arthur Babcock, who supplied a car, sold Hoover vacuum cleaners. There were generic jokes about vacuum cleaner salesmen during the depression, but Dad and Mr. Babcock had remarkable success. They mapped out our section of the city and were relentless in their pursuit of a sale. They would demonstrate the efficiency of their product for weeks (free house cleaning), would enjoy the visiting process, and eventually their prospects would succumb. They enjoyed each other's company and seemed to indulge in some amateur psychotherapy when the customers needed it. The mere process of people befriending each other during the depression was therapeutic. Finally, Dad had our rent reduced a bit by doing repair and maintenance work for our landlady, who lived next door. Somehow, we managed, as did countless other families in the same circumstances. My father was re-employed at Saks Fifth Avenue.

No doubt influenced by the high unemployment rate in most fields of endeavor, my mother suggested that a postman's job was a worthy one because, as a federal employee, a postman had security from being laid off. I suggested that I might be more interested in teaching, and she responded well to that, thinking that it could mean a local position for me. I never deviated from my more specific goal of being involved in college teaching. Even to attend college, however, was an uphill climb in 1933, but more about that elsewhere. I visited my parents as often as possible when I was at Lehigh University, but I worked away from home during three of the summer vacations and tried to save money by not traveling. After two years at the University of Oxford, my time in graduate school at Columbia University was concentrated on research, but I managed to visit my parents in their new apartment—the second floor of a two-family house—in Mount Vernon on occasional Sunday afternoons. My first academic position at the University of Illinois put real distance between us, and wartime travel was discouraged except for professional reasons.

Was there no emergency that made travel to Mount Vernon necessary during this period? Yes, indeed. It was due to a misadventure in 1944.

While my mother was eating some chicken, a small bone had penetrated her esophagus, and foreign matter had been aspirated into the larynx and thence into the lungs. Complications had produced pneumonia, and she was losing her spirit. My father was also dispirited and exhausted. After work each day in New York City, he would stop at the Mount Vernon Hospital to see Mother, try to cook something for himself, and prepare himself for the early morning trip to the City. The impossibility of the situation was confirmed by the doctor. I made a late night decision to go to Mount Vernon, a colleague helped me cash a check at an all-night liquor store, and that allowed me to purchase a round-trip rail ticket, with a one-way reservation. There was no credit card economy in those days. I must say that the Mount Vernon situation improved upon my arrival. My mother rallied as I spent the days with her in the hospital until her release. I cooked for my father and arranged for necessary dry cleaning and all such matters to which my mother usually attended. He became less desperate. By arranging for temporary home nursing care, I was able to return to Illinois. It was really the first time that I had taken care of my family! Two of my colleagues in Chemistry at the University of Illinois taught my courses in my absence, in a great show of sympathy and comradery.

My parents made their first trip by train to Urbana-Champaign in 1946. They stayed in the best guest facilities available at that time, the Urbana Lincoln Hotel. My father captivated the hotel staff, so that all kinds of service appeared that had not existed before. I could show them the twin cities and introduce them to all of my friends at the University. They listened to rehearsals with Grace Wilson, Jane Watt, and Leroy Hamp, my voice teacher, but they could not remain for the recital itself that we had been planning. When they left Urbana on the Big Four Railroad for Indianapolis, a rail strike was in the offing. They called me from Indianapolis when it happened, asking what to do next. My advice was that they remain in the terminal and be ready to board their train for New York when President Truman would call an end to the strike, which, luckily, he did after approximately four hours. When they were on their way again, they celebrated with dinner on the overnight N.Y. Central train. Coffee was served while the train was in some station along the route, and my father asked as usual for a full cup of coffee. The waiter tried to predict for him what might happen when the train would be in motion, but my father was adamant. The result of the moving train's wobbly motion: a shower bath of coffee. My mother, who had heard almost every day of their married life, "What I do like is a *full* cup of coffee," giggled all the way to New York, according to my penitent father.

## MORE THAN A MEMOIR

He and I had become accustomed to some of my mother's statements when some piece of art or music was not to her taste, "That's different," or "That's unusual," or "That's interesting." The brutal translation, which my mother would never use, is "I don't like it." I am told I slip into the same judgmental habit occasionally. My mother wrote to me regularly when we lived apart. My father seldom wrote, but when he did, he always affixed a Special Delivery stamp to the letter. This was his signature, and it happened whether I was in Boy Scout camp, away at college, or only twelve miles away in New York City. He wanted me to know "right then" that he was thinking of me! I am still somewhat startled when I receive a Special Delivery letter.

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## SCHOOL YEARS—1921-1933

All of my schooling took place in Mount Vernon, New York, and all of the schools were within walking distance from our house: Robert Fulton, Sophie J. Mee, Washington Junior High School, and A. B. Davis High School, in sequence. These schools, or the buildings that still exist, now have different names and functions. The teachers were a dedicated lot. The students represented a good mix of the population of the city in those years. In elementary school, I skipped the second halves of the second and fourth grades and, in general, found the lower grades rather slow-paced. As a result, I often indulged in mischief and spent some time standing with my face to the corner of the classroom, which was the punishment for minor infractions. If I walked alone to Fulton School, I was sometimes late. The final short cut of my walk was a path through a wooded area, and in the spring there were abundant diversions due to the emerging flowers and small creatures. When it was raining, there was the invented diversion of racing matchsticks down the tracks of the Fulton Avenue trolley. I was frequently discouraged from this pastime by passing motorists because the tracks were in the middle of the road! By fifth grade, I was more attentive; in sixth grade, I became steeped in books; and by seventh grade, I was intrigued by mathematics and general sciences, and was inspired by an English teacher, a Miss Redington. I found later, in high school, that many other students had been influenced positively by her. Junior high school provided a year of Latin, a taste of French, and general music education in addition to the usual subjects.

What did we do in our spare time as boys growing up in Mount Vernon? There were, of course, chores to be done depending on the season: weeding the garden, mowing the lawn, raking leaves, and shoveling snow. The seasonal sports included touch football in the street (discouraged by the police) or on the church grounds (discouraged by the custodian), ice skating alongside Eastchester Parkway or at Playland, Rye, New York, sledding (with luck, up to a mile downhill from the front of our house when the snow on the road was well packed), basketball (at two houses on the street), roller skating and biking, and baseball (on a vacant lot). We learned how to walk the picket fences that separated the back yards and

how to run up and down garage roofs, jumping from one to the adjacent one. We pestered neighbors by pea-shooter attacks on their windows (at Halloween). We found tennis courts where we were allowed to play as long as we scraped and rolled the court afterwards. Two of our number became excellent tennis players and competed in city tournaments in their age group. We went swimming off Glen Island or in Wilson's Woods Pool. The "we" consisted of boys with the family names Minkowsky, Palestine, Fisher, Van Cott, Meury, and Leonard. I still keep in touch with Allan Van Cott and with the widow of Ed Meury. I last saw the Minkowsky twins, a great touch football combination, at our fiftieth high school class reunion (1983). They recalled, for the unwelcome edification of Nell, that I could burp louder than anyone else on the block and that I could climb up to and jump out of selected second story windows in our house.

We boys scrambled to make a little money by payment for chores, delivery of groceries, selling magazines. I wasn't very good at marbles, so I invented a game that involved a friend rolling marbles at a cardboard cut-out which I made and held in place. It had gates designated 1, 5, 10, 5, 1—the number of marbles he would win if a marble went through one of the gates. The "house" invariably won since it kept all stray marbles. When the friend's marble supply was exhausted, I would sell him back his marbles so that he could continue the play. Needless to say, I did not retain the monopoly on this game very long. Other boards appeared even on the second day, and the process was neutralized. I had a similar gimmick based on stamps, for we were all stamp collectors. I bought from Scott Stamp and Coin Company special issues of beautiful stamps that I knew my friends did not have and could not resist buying from me (at a higher price than I paid for them). Some British Honduras issues come to mind, also some of the French colonies. Of course, that process was soon neutralized as Scott gained new Mount Vernon customers. A miniature golf course, actually three holes, served me better. In the alley next to our house, I constructed these skill-testing holes from pipes and turf on several levels. My imagination exceeded my ability to construct professional-looking, complicated challenges, but my friends would shell out five cents a try until they shot par, when it became free. Even adults, e.g., my parents, became players. At least, my construction remained the only miniature golf course on the block. When I became a choir boy, I earned "real" money, but that is covered in the chapter on my musical experiences.

Regular meetings of our Boy Scout Troop #5 at Trinity Church kept me interested, but it was the summer camping that I lived for. The first summer experience was discouraging, however. The Scout camp I attended when I was 11 years old was a collection of tents at an attractive

spot on the Hudson River, about 40 miles north of New York City. I was scheduled to be there for two weeks, but I only lasted one. I developed a systemic *Staphylococcus* infection (“boils”) probably from scratching mosquito bites and abetted by the contents of the river at that point. With no sulfa drugs or antibiotics available yet in 1927, the treatment was only palliative, but my system managed to rid itself slowly of the infection, aided by the regular house calls and ministrations of our family physician, Dr. John Tallman. At the end of the summer, I spent a compensating week at a choir camp that was laid out on the grounds of a wealthy church member, a surgeon, near South Norwalk on the Long Island Sound. The contrasting experience restored my excitement about camping, swimming, and athletic contests as a summer diversion, but not enough to return to the Scout camp while it was still located on the Hudson. Two years later, it was relocated as Camp Waubeeka on a small lake near Copake, New York, and I went as a somewhat more mature camper, attending regularly into the high school years, participating in the horseback riding, swimming, canoeing, athletics, backpacking, and finally serving as a junior counselor. Those summers made it possible to rise through the ranks of scouting, by taking the necessary tests and adding merit badges as required, to Eagle Scout and beyond, including the Order of the Arrow. In my final summer, I spent eight weeks at Camp Waubeeka as a totally enjoyable experience. Imagine my surprise when, 50 years later, I was driving east from Albany, New York, to a summer chemistry meeting in New Hampshire and suddenly realized that the NY Route 22 south exit would take me to Copake. The sleepy town had not changed very much, but it did look the worse for wear. I followed my instinct to take the dirt road out of town that should lead to a small side road bearing left after about one-half mile. Sure enough, there was the small diversion indicated by the sign “Camp Waubeeka.” I drove in and found a trailer camp! The grounds were smaller than I remembered and the lake appeared minuscule in size. None of the Scout cabins, of course, remained, only an office and rows of electric hook-ups for trailers. I hoped that the present occupants of the terrain were appreciating the simple, natural surroundings as much as I had in years long past. I squeezed my eyes tightly shut to imagine the log cabins of the Mohawks, the Gramatans, and the Algonquins, the administration building, the mess hall, the horse ring, the baseball diamond, the water slide and high dive, and the canoes in water fights and tipping contests. Then I drove on, quietly fulfilled.

The early friends continued as such as in high school, and new friendships were forged. John Hess and I played tennis together on a private court across the street from his house. We also worked together on the preparation of Scout merit badges. Johnny’s father taught chemistry in a high school in

the Bronx, so we had access to all kinds of outline material that made our own study of chemistry more efficient. Alex Kaplan was outstanding in English and had cultivated a large vocabulary, so we did some editing together of the high school year book. Bill Weeden, who was not college-bound, became a friend one could rely upon to propose new adventures. At a parents' night at Washington Junior High School, both of our fathers attended and were amazed to see each other again. They had been good friends in a Young Men's Christian Fellowship in New York City about 20 years earlier! Gurney Woodley, an excellent jazz pianist, was my accompanist when I was called upon to sing on high school occasions. Edward Williams was the high school football hero, an unstoppable fullback, who became a teacher and whose son followed him as a teacher. Robert Fulton School was renamed after Eddie, as I learned when I saw him at our fiftieth reunion. At that time, we wrote a note to Catherine Rhodes, over 90 and quite unwell, who had been our inspirational trigonometry teacher.

Another excellent mathematics teacher was Florence E. Brown, who was also my home room teacher for two years. Physics and chemistry were taught enthusiastically by Malcolm MacGregor and Frank P. Bunker, respectively. The chemistry laboratory was a bit haphazard, but I am sure that I contributed to making it so. Emil Nielsen conducted the glee club and coached and directed musicals in a very professional manner, which made participation enjoyable and our performances successful. His daughter Doris and I maintain contact by means of family Christmas cards that are exchanged each year. Elaine Schleicher, who was an attractive (blonde) member of the glee club and appeared in the chorus and dance numbers in the musicals, became a good friend. Together, we went to Radio City Music Hall for occasional Saturday matinees, to parties, and in groups for ice skating and to dances, which we were required by our parents to leave early lest they become rowdy. (They did!). Her mother took kindly to me and occasionally asked me to have dinner with the family. The three sisters, of whom Elaine was the youngest, performed on the radio regularly as a trio, singing close harmony. The older brother was a performing jazz musician.

To finish the roster of teachers, Alice Brower, who taught senior English, really challenged our intellects and inculcated the techniques of writing, whether exposition, book review, short story, or commentary. She incited us, by quoting from the Sunday *New York Times* Book Review Section, to prepare, keep, and modify a book list for intended reading. She was a tough and accurate grammarian. She appreciated her students more than I realized in that final year (1933). When Nell and I were in Bronxville, New York, to be married (1947), Mrs. Brower must have read the notice in the local newspaper. She telephoned my aunt and asked if Nell and I

could stop by her house for a moment, which we did. I thought she wanted to assess Nell, who always “assessed” very well, but she also produced, from a pigeon hole of her desk, the original of an essay I had written 14 years earlier. When Nell and I read it, we couldn’t understand why she had kept it. We didn’t keep it, even though I valued Mrs. Brower’s remembrance.

My activities in high school were limited (e.g., music, French club, student council, hospitality committee, senior (touch) football, secretary-treasurer of the class) because the church choir took a lot of time and because I had to concentrate on getting high grades. Those were necessary if I were to obtain any college scholarships. I also had to do well on the Regents Examinations, required by all New York State institutions and accepted for admission by many out-of-state colleges. My tactics paid off, because I was presented with a record number of prizes at graduation. My friends almost collapsed when, toward the end of the presentations, I also shared in one for perfect attendance. Yet, I was not the valedictorian. That honor went to Grace Kryske, who had excelled in subjects for which not many prizes were offered. I tried to balance the academic concentration during the junior and seniors years by running around the track at the end of the school day whenever I could, usually about two miles. It made me feel good, but my pace was never fast enough to make me a reasonable candidate for the track team. The same was true when I went to college.

Material for the 1933 class yearbook that was gathered at the end of 1932 for each senior included an indication of the college that the senior hoped to attend. In actuality, the hope for attending college became unrealized for many. We were still deep in the Depression that had started when we were freshmen. When the banks were closed in March of 1933, many reopened in a reorganized form that was not favorable to the depositors. When the Mount Vernon Trust Company, where I had deposited my ten or more years of savings, reopened, my balance was half of what it had been before that March. I had enough money for one semester of college, not one year, that is, for living, fees, books, etc! I would still need a renewable scholarship. I retained my optimism about college when Lehigh University offered me a one-year tuition scholarship, largely through the intervention of Morton Sultzer, who was simultaneously a Trustee of Lehigh, Warden of the church where I was a choir boy, a Commissioner of the Boy Scouts in Mount Vernon, and a friend of the family (i.e., my mother was a baby sitter for his young children). He may even have had something to do with the Board of Education in Mount Vernon, so versatile and dedicated was he. Accordingly, I luckily attended the University that was indicated beside my name in our yearbook: Lehigh University, in Bethlehem, Pennsylvania, an all-male, largely engineering school with an excellent reputation.

## LEHIGH YEARS—1933-1937

I had fallen in love with Lehigh, especially the campus, when Morton Sultzer drove my mother and me to Bethlehem, Pennsylvania, in the fall of 1932 to see the University and to be interviewed by the Director of Admissions. I did not visit any other university, nor would that have been necessary after I was offered a one-year tuition scholarship by Lehigh, renewable if my grades would merit it. When it came time to leave for college, I received a wristwatch, a typewriter, some new clothing, and an array of advice. My parents asked me not to smoke and not to drink alcohol, and I promised to follow their wishes. I received practical advice from my two uncles and two cousins who had gone to college, although I felt confident that I would be able to make all the necessary decisions on my own as I became acquainted with my new circumstances. My parents suggested that I keep an expense account monthly so that I (and they) could follow how my finances were holding out. I later found some of those freshman expense accounts among my mother's keepsakes and was amused by the listings that included, for example, one cent for crossing the toll bridge over the Lehigh River. Was it included to show my seriousness about keeping track of expenses or was it my attempt at being humorous?

Freshman orientation week had a number of purposes, including the taking of placement examinations, allowing us time to find lodging, acquainting us with the fraternities on and off the campus, and frightening us about venereal disease. The industrial Lehigh Valley had had a bad reputation for houses of prostitution; accordingly, Lehigh sought to protect its all-male students from association with the sex industry. The descriptions and the slide illustrations of the ravages of gonorrhea and syphilis were sufficiently graphic to make some of the viewers faint. I didn't, but I was impressed by my innocence of some of the dangers of life, especially in the Lehigh Valley. I found lodging in a rooming house only a few blocks from campus where room and board together amounted to \$35.00 per week. The accommodation was Spartan but the food was plentiful. I agreed to join one of the fraternities after my freshman year or when I had enough money to pay for the initiation fee. I was not a very good catch. I held strongly to my independence.

What was different in college from the high school experience? One took notes as the professor lectured and then outlined the material so as to make it digestible and reproducible. Reading assignments were to be taken seriously—both in the textbooks and in related sources. Whole books were to be digested. Essays and reports were to be written and submitted on time. Quizzes and exams were frequent. Questions were expected by the professor and discussion was encouraged. The most important lesson I learned was to keep pace, even to anticipate by reading ahead; otherwise, it was possible to be overwhelmed. I had entered the curriculum of Chemical Engineering, but the freshman courses were in basic science and liberal arts subjects. An additional required course was chapel at 7:30 in the morning. It consisted of readings in moral and religious philosophy by Dr. Beardslee. Unlike most of the students, I enjoyed those early mornings in beautiful Packer Chapel; nevertheless, the grade in chapel, which depended only upon the number of mornings attended, was not counted in one's academic average. Accordingly, I ceased attending when the grade became respectable. In a voluntary course called "Brown and White" after the weekly Lehigh newspaper, I was assigned to do chores for the business editor, but I was a misfit and received a grade of C, which was a blemish on my record, not to be repeated.

Because soccer had been my favorite recreational sport in junior high school and high school, I went out for Lehigh's freshman team. J. Harry Carpenter, who was the coach, concentrated on fundamentals and physical training. My chief remembrance of those intense, late afternoon sessions was that they ended with a cold shower. There was no hot water in the stadium on the other side of town where we practiced. At the end of the season, we had contests to see what we had learned or mastered. I won a medal for heading the ball. However, that was not my real ability. At the position of right-wing, I learned to corner kick so that the ball would land just in front of the goal. Also, at the end of the season, when we played a team of sophomores, I had the thrill of kicking the winning goal. By tradition, if a freshman team beat any sophomore team, the Lehigh frosh would no longer have to wear required "dinks" on the campus. A "dink" was a small, brown peaked hat that was required to be worn by freshmen for one year unless the outcome of an interclass contest decreed otherwise. After the soccer match, we freshmen were no longer victims of discrimination. In the spring of 1934, I was an assistant manager of freshman baseball, which helped to keep me in good physical shape and which gave me a new cadre of friends who were, it must be admitted, occasionally impatient with me.

It was necessary for me to earn some money, and several possibilities appeared: tutoring, selling programs at football games, substitute waiting

on tables on weekends at several fraternities, and, in due course, WPA (Work Progress Administration, USA) assignments in the Chemistry Department. I also received hourly pay for assisting at registration time each semester. I was not paid for singing (alto) in the choir of the Pro-Cathedral Church of the Nativity. The singing, along with that in the Glee Club (tenor for the first two years) is covered in another chapter. Friday night choir rehearsals, with bowling afterwards, and Sunday morning services gave a certain rhythm to each week. Initially, I could not afford any Saturday night entertainment, so I provided my own peculiar diversion—watching trains. There were four railroads with termini in Bethlehem: Lehigh Valley, New Jersey Central, Lehigh and New England (a freight line) and an interurban that ran to Philadelphia. These made the comings and goings, the backing and fillings, the changing of engines, and the snorting, huffing, and puffing practically continuous. I learned the schedules and reveled in the activity while I admired the rolling stock. My presence in the terminals was at first suspect, but then I found conversation possible with some of the Saturday night crews. I could not feel sorry for myself for not attending a movie. I was in my own railroad heaven. I was given an occasional meal at the home of Carl and Emma Jordan, who lived in Bethlehem. Carl, who was my mother's second cousin, had an office position at Bethlehem Steel Company. Their neighbors, the McClintocks, were somewhat more interesting because they had a daughter, Margaret, a freshman at Moravian Seminary, who became a friend, but it took some inventiveness for me to arrange "dates" that did not require much expenditure or transportation other than trolley cars and buses. In retrospect, I realize that she was a very good sport.

My finances stretched to the end of the freshman year. Trips home to Mount Vernon at Thanksgiving, Christmas, and Easter were made by the cheapest means possible—by rail, bus (Golden Arrow Lines), a ride with a friend's parents, or hitchhiking. For part of the summer, I worked as an office boy in an insurance company in Mount Vernon. My full tuition scholarship was renewed for the sophomore year, and I received notice of the award of the Wilbur Second Prize in Mathematics, which was monetary. During the sophomore year, I had a full-time job waiting on tables at my fraternity house, with the result that I was no longer a boarder in the town quarters. I shared a room there with Dick Lake and Bill Dukek, both fraternity brothers, and we became the best of friends despite the limited space available for our study and sleeping on the third floor of the house. The fraternity became impatient with me for not becoming a bona fide member. Andy Buchanan, the Director of Admissions and also an adviser to the social fraternity, heard of the disputation and loaned me the \$75

initiation fee, which I repaid—to his surprise—at graduation. I passed through the informal initiation, then called “Hell Week”, satisfactorily but quite sleeplessly. I felt that the fraternity had to raise its academic standing, which I aided by offers of tutoring, guided by nomination for membership of underclassmen with good averages, and continued to influence as academic adviser and then Vice President. An enforced quiet time after 8:00 p.m. on weekday nights also helped to establish study habits. I dulled the fraternal atmosphere somewhat by suggesting cooperative repaint-and-repair schemes to replace beer-drinking episodes.

“Mustard and Cheese” was the name of the club that put on plays under the able direction of Al Rights. Upon the urging of my fraternity brothers, I tried out for and obtained a part in “Yellow Jack,” a drama concerned with the digging of the Panama Canal. As for soccer, I remained a varsity substitute during most of the season in the sophomore year, and in the spring, I ran around the track, barely attracting the coach’s notice. The truth was that I was studying very hard, learning to sleep minimum hours and to take quick catnaps between responsibilities. It was my best year academically and I was rewarded with the Chandler Chemistry Prize and the Wilbur Scholarship, the value of which—\$200 cash—provided welcome financial relief. I was urged to run for Class President, in which I was successful, and the title took effect in the junior year, carrying with it some additional memberships and responsibilities. The first weeks of the 1935 summer were occupied by taking a laboratory course in assaying, a pet creation of Professor Alpha Diefenderfer, that was required of all chemists and chemical engineers. It consisted of analysis of everything from gold in ore to butter fat in ice cream. I paid for my board by waiting on tables for the ten or twelve friends who were registered in the course and who lived and were fed in the fraternity house, which benefitted thereby from the additional income. When the course was over, I spent the rest of the summer in an analytical chemistry job in the New Jersey Zinc Company, Palmerton, Pennsylvania, where I had a small room in an apartment over a drugstore and took my breakfast and dinner across the main street in a rooming house. My colleagues at the table were a tough lot of bachelors who worked in the heat of the zinc smelters. The food was plentiful, e.g., cabbage prepared in four different ways was available every night, but conversation was spare. As a college student, I was a new phenomenon and was the butt of much humor. Unspared were my home-taught manners and my “puritanical” attitude concerning drink and women. However, by the end of the summer, I seemed to have converted at least two of my companions, who told me that they were settling down, saving money, and planning to find the right person to marry. When I drove

through Palmerton in 1987, the old zinc mills had been dismantled, the train bridge across the river was rusted away, and the landscape was barren.

During junior and senior years, I lived in the fraternity house, where study rooms were on the second floor and sleeping dormitories, one “cold” and one “warm”, were on the third floor. The distinction between them was in the number of sides of the dormitory devoted to windows, three or two. I chose “cold.” My study roommate was Ben Chadwick. I paid for my board by waiting on tables. Fraternity living provided more friendships and more social life, and being Junior Class President provided complimentary tickets to such events as the Junior Prom. My participation in soccer improved to the extent that I went on trips to “away” games, but my track performance never did shift into high gear. My voice had settled to a stable bass-baritone range, which gave me the opportunity of singing solos in Glee Club concerts and playing leads in two original musical comedies. In the spring of 1936, I was approached by Philip M. Palmer, who had been my German teacher and was also Dean of the College of Arts and Sciences, and by Neil Carothers, who had been my economics teacher, to suggest that I might be a reasonable candidate for a Rhodes Scholarship at Oxford. The only hitch was that I would have to shift from the Chemical Engineering to the Chemistry Curriculum. No one had ever been successful applying as an engineer. The exciting suggestion was a godsend because I had become disenchanted with chemical engineering. As taught, it seemed too empirical, and I also recognized that I was not very practical. The change in curriculum was to take place in my senior year. Harvey Neville, who taught a comprehensive course in inorganic chemistry, encouraged me to make the change, pointing out that it would lead to more career options following graduate study. I was pleased to recall his advice when, in 1963, as President of Lehigh University, he bestowed on me an honorary doctorate degree.

Joseph Walton, who was captain of the football team, and I were elected as juniors to Omicron Delta Kappa, the senior honorary fraternity that was based upon activities as well as scholarship. Joe and I would become skiing buddies in the late 1970s when he and his wife Louise visited us regularly in Snowmass Village, Colorado. The final required academic experience of the junior year was a four-week summer course on heat engines, given by the Mechanical Engineering Department. It was a terrific course, quite distinct from any other experience I had had. An arrangement similar to that of the previous year was made with the fraternity to feed and house some of the registrants in the course and to include Ben Chadwick, who was taking the assaying course at the same time. For amusement on weekends, we would drive to Hershey, Pennsylvania,

where the big bands of the 1930s played in a large dance hall. Ben and I had summer jobs at the Solvay Process Division of Allied Chemical Company in Syracuse, New York, that were obtained through the influence of his father, who was a New York executive in the company. My job was in analytical chemistry where I substituted for staff members on vacation. Ben's job was much more arduous and physical, for he was part of a crew installing pipe lines. We remained compatible through the summer, and we benefitted socially from contacts provided by his family's friends in town. As a result, some of the non-working hours were passed agreeably in swimming, eating home-cooked meals, playing duplicate bridge, and dancing at the local country club, where I also caddied for Ben. When Ben and his car left for his home in New Jersey, life was somewhat less convenient because I had to walk to Solvay every day, four miles in each direction. Nevertheless, I had saved enough money for expenses in my senior year, and I was in good physical shape when I returned to Lehigh.

In the senior year, I had to make up courses that had not been required in the engineering curriculum but were required for the degree of Bachelor of Science in Chemistry: philosophy, history, English literature, and senior research in chemistry, all of which made my last year thoroughly enjoyable. The famous historian Lawrence P. Gipson taught a course in International Politics that was exciting and contemporary. The set times required for laboratory courses in past years became free time for library work. I obtained the job of attendant in the Browsing Room, where I had access to shelves of current works, and, because of the light traffic, I could read selectively among the books on history, current affairs, and biography. Vahan Babasinian ("Dr. Babs"), who had taught advanced organic chemistry, allowed me to use his private laboratory and special small-scale apparatus for the study of electrophilic substitution on thiophene in comparison with benzene. I was given the chance to play in most of the varsity soccer matches. The fall semester was a prelude to appearing before the Rhodes Scholar selection committees in December, first the state and, upon success at that level, then the regional committee. Both interviews were held in Philadelphia, where I was given hospitality by Bill Dukek's parents. I can still remember some of the questions I was asked in those oral confrontations. Those questions or my partially adequate answers occasionally return to haunt me in dreams. I lost four pounds during those Philadelphia days, but the world had opened up for me! Now, when I attend annual meetings of the American Philosophical Society, I step into the APS building where the final successful interview took place, to remind myself of how much in my life was a result of those memorable days. During the procedure, I was particularly attracted to the

other three successful competitors from the district: James Gardner, Harvey Wellman, and Robert Harmon. Chadbourne Gilpatrick, probably the most interesting of the lot of us, competed again the following year and came up to Oxford in 1938. The four winners were announced at the end of the district-examination day.

During my euphoric final semester, Professor Babasinian encouraged me to write a two-part senior thesis. In the second part, I reviewed the published work of Neville Vincent Sidgwick, Professor of Inorganic Chemistry at Oxford, who was a don of Lincoln College. His comprehensive contributions to the organic chemistry of nitrogen convinced me that I should make Lincoln my preference among the Oxford colleges, where I was fortunately accepted for matriculation. My new status allowed me a somewhat larger voice in the academic and social affairs of the fraternity. Donald and Mirjane Kemmerer became favored



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chaperones at our fraternity dances. Don had been my teaching assistant in economics and would appear in my life again as a professorial colleague at the University of Illinois, where he taught economic history. The Kemmerers offered me exceptional hospitality when I came to Illinois. The Dean of Men, Max McConn, would drop in selectively on fraternity house parties to check whether all the rules were being followed. I suggested that we invite Dean and Mrs. McConn to dinner, when everyone would be on best behavior. They accepted, but they enjoyed themselves so much, they stayed for the entire evening. I received a lot of teasing about that ploy. The Dean was the author of a very amusing book about student life from a Dean's point of view. It was also obvious that he enjoyed being with young people who were willing to chat with him on a frank and cordial basis.

The week of final exams was a lark because of the enlightened Lehigh practice of excusing seniors from final exams in courses if the seniors were satisfied with their cumulative course grades prior to the finals. Since I was well satisfied, I used the time to visit friends and relations. I had to deliver the Ivy Oration and plant some ivy on behalf of the class of 1937. It was not a very original speech. A large family contingent came to the graduation and enjoyed both the social and the formal proceedings. I seem to remember my Aunt Flora saying to someone that she put me through

school (sic). In the lineup for the march into the chapel, I was visiting friends earlier in the alphabet. When I returned to the Ls, my friend Moses Lore, who was just behind me in line, gave me an envelope that an unknown lady had entrusted to him. This long-time Lehigh supporter had written a note of appreciation for my enthusiastic participation, scholarship, and contribution during my four years at Lehigh and had enclosed a check for \$200. That large sum, which almost paid for my ship passage to England in September, was completely unexpected. Her spontaneous act was most poignant. Lehigh University had been the right place for me to be for my undergraduate years—the right size, the right environment, and the right quality level! My Uncle George and Aunt Kate organized a graduation party, a dinner dance, for me at the New York Athletic Club on Long Island Sound for ten of the graduating seniors from the fraternity with their dates. I was not too enthusiastic at first because I had to use up my supply of girlfriends as “blind dates” for those who came alone. The dinner dance was very successful, even though it was alcohol-free. The Athletic Club staff claimed that they had never served any group that had enjoyed themselves so much and were so well behaved.

Morton Sultzer showed his friendship and his influence again by securing a summer job for me at Bell Research Laboratories, then located on West Street in New York City. The commute from home in Mount Vernon involved the sequence: walk—trolley—subway—walk, which took about one hour and fifteen minutes, if the connections worked well, and cost only \$0.20 per day. The work involved the testing of an analytical procedure for dissolved gases on the brass connectors used in telephones and also the translation, from German to English, of selected analytical procedures that were of interest to the Analytical Division. The most exciting experience of the summer was watching the ocean liners arrive and depart. My laboratory afforded a spectacular view of the Hudson River, and I followed the liner movements according to schedules published in the daily newspaper. A fortunate introduction to Professor Sidgwick took place at Bell Labs when he gave a lecture there. He took me to dinner at the Waldorf-Astoria that evening, where we discussed the sequence of events that would occur when I would come up (as the phrase is used) to Oxford in October. I was exhilarated at the prospect and felt immediate respect for Sidgwick’s intellect and humanity.

## THE OXFORD YEARS—1937-1939

The writing of this chapter mainly from memory was aided by the diligence of my mother in preserving and numbering approximately 70% of all the letters I wrote regularly to my parents during my two years abroad, 1937-1939. If additional letters turn up during this writing and editing, I shall be able to affirm or amend various points. In those cases where I offered only partial news in letters, I shall try to provide more complete information as to what I did and what I thought at the time. In all truth, letters to one's parents may be of only selected material, but I tried to keep them abreast of everything I considered new and important. My mother and father had not traveled in the United States and never abroad; my eyes had to be their travel vehicle. They had only one child whom, although grown, they were accustomed to seeing frequently. Thus, I readily assumed the duty of writing to them often. I enjoyed the feature that they would be able to appreciate my new impressions and experiences vicariously. I also enjoyed keeping in touch with them.

The two years at Oxford, including vacations and travel, were the happiest years of my unmarried life. How could that be, when the world was in turmoil and there was already great destruction and great suffering, when military aggression was unopposed? Each of us must lead his own life in the best possible way under whatever circumstances are given. The major difference of the years 1937-1939 was that I was being *paid* to study and to travel. In all previous years, I had to work, to try for scholarships and prizes and, fortunately, to be blessed with occasional gifts. Each course that I took in high school and college had to be taken for a high grade in addition to appreciation and absorption of the material therein. At Oxford, the only expectation was that I would attend lectures, read the scientific literature, and do research. Until September of 1937, the summers had meant opportunities to work in order to store up a little cash for each following school year. The will of Cecil B. Rhodes specified that the stipend of the scholarships should be sufficient for the recipients, Americans and Colonials, to learn something about Europe in addition to pursuing a degree at Oxford. Thus, our quarterly payments of 100 English pounds, then equivalent to 500 U.S. dollars, continued

through the vacations and were expected to be used for travel as part of our education.

There were other obvious gifts of those two years. Everything was new: places, people, food, customs, music opportunities, politics, sports, travels, lectures, books, discussions, plays, and movies (foreign). Everything was to be experienced. There was time to think, time to understand, and time to develop my own philosophy of life. There was time to develop strong friendships. There were emotional surprises, not the least of which was meeting and falling in love with Nell and deciding jointly upon a life partnership, which, due to the advent of World War II, threatened to be evanescent.

The first new experience was the crossing of the Atlantic on the S.S. Statendam from New York to Plymouth, England. The sailing date of September 28, 1937 was approached with many "goodbyes." As the only son and only nephew of my father's sisters, I had many family goodbyes. Travel abroad by ship in 1937 was a rather limited experience, at least for my parents' friends and for my own friends from high school and college. As a unique voyager, then, I had to say goodbye to all of them and to the odd acquaintance of the day whom my gregarious father brought by the house to see his "famous" son. A sailing party was also a novel enough experience that, in addition to my mother and father, Uncle Louis and Cousin Virginia, and family friends Mr. and Mrs. Morton Sultzer, a large group of my Lehigh fraternity brothers appeared aboard the Statendam. Everyone came with gifts, which embarrassed me because I was uncertain as to when and in what order to open the gifts; moreover, my suitcases were already full. The gifts were duly listed and thanked for. I spent some time with each of those who had arrived unexpectedly, but I am sure that I didn't provide the refreshment that was expected. I was too naive. I was actually quite relieved when it was time for visitors to go ashore, and goodbye-waving could take place impersonally and without emotion.

Many factors contribute to the joy of a sea voyage, especially of a *first* sea voyage. I spent a very large part of my time just gazing at the sea and the sky in wonder and awe of the beauty and of the power of the waves. Walking the deck was supplemented by ping-pong, deck tennis, shuffleboard, bridge, swimming, working out in the gym, taking movies and attending movies, and meeting the other Rhodes Scholars on shipboard. My cabin mate was Henry Hicks of Nova Scotia. At the time of selection, he was a chemist, but he went into law instead and eventually had a successful career in Canadian politics. Harvey Wellman of Cornell University and I had appeared before the same district selection committee

in the previous December and had become friends. He eventually ended up in the U.S. diplomatic service, and his daughter, whom I met in the 90s, became a staff member at the University of Illinois. James Egan of Trinity College, Hartford, was to be enrolled in Exeter College, the neighbor of Lincoln College in the Turl Street. We were indomitable bridge partners. My thirst for bridge was generated by envy of my Lehigh fraternity brothers. Those who studied Business Administration rather than Science always seemed to have time to play bridge in the late afternoons when the science students were still in their laboratories. I was making up for bridge deprivation during my Lehigh years.

Robert Harmon of Yale and Norman Davidson of the University of Chicago were fellow chemists. When Norman discovered that I was also a chemist, he suggested that we have a discussion of the relative merits of Bohr Theory and Quantum Theory, which would have been beyond me. I countered with the excuse that I had never been on an ocean voyage before and that I was enjoying being in limbo, without a care for chemistry. I suggested that we play ping-pong instead. What I did not know was that Norman's sport was tennis and his prowess carried over into ping-pong. We were more evenly matched when we played shuffleboard. Norman and I were laboratory partners in the Dyson-Perrins laboratory for two years, we overlapped when I was studying at Columbia University and he was on the Manhattan Project, I visited him when I was at the University of Illinois and he had returned to the University of Chicago, and he has been a mainstay in Chemistry and in Biological Sciences at Caltech, which is now my professional home. Leslie Epstein had been an undergraduate at the University of Illinois and had spent two years in Medical School at Washington University, St. Louis. More mature than the rest of us, Leslie had clearer opinions on the world and science. He was a suitable contestant for Norm Davidson in ping-pong. Les and I were both headed for Lincoln College, and we also shared lodgings ("digs") in Oxford during a portion of the vacations ("vac's"). Two of the other passenger-scholars shared my interest in joining the Oxford Bach Choir. Others of the Rhodes group became good friends while frequenting the various bars on board. I barely knew of the existence of bars because I did not drink any alcohol, not until I was 26 years old and at the University of Illinois.

First impressions carried over from sea to land: sailing past the Scilly Isles, sighting the coast of Cornwall, arriving in Plymouth Harbor, being piloted into the actual port by tender, prowling the streets of Plymouth at midnight, climbing up to the Hoe and thinking of Drake's conquests (along with the weather) of the Spanish Armada, figuring out the currency, fearing for one's life during the first taxi ride (on the left side of the road), viewing

the English countryside and the rugged sea coast, loving the trains, seeing London for the first time, and seeing the spires and domes of Oxford following the train ride from Paddington Station.

Lincoln College, founded in the 15th century, was to be my home in Oxford. The choice of a college, at least from my side, had been made because of Neville Vincent Sidgwick, who was the resident Professor of Chemistry. I had read his publications during my senior year at Lehigh, and I loved his book on *The Organic Chemistry of Nitrogen*. My attachment to the subject was actually prophetic since I have spent most of my professional life doing research on organic compounds that contain nitrogen. Lincoln was then one of the smaller Oxford colleges, although it has had remarkable growth in the last 50 years. My rooms on the ground floor consisted of a large sitting room or study and a small bedroom. Through the tall windows of the study, I looked across the back quadrangle at a group of trees hiding the opposite high wall. I had a small fireplace in the corner where I burned coke from my own coke bin. Old Ted, my "scout" or servant, a Lincoln employee for 45 years, regularly waked me in the morning, supplied me with a basin and a pitcher of hot water, and started the fire. I crossed one quadrangle to reach the toilets and three quadrangles to reach the bathtubs (no showers). The facilities have been modernized satisfactorily since my time at Lincoln! My scout cleaned once in a while and would deliver tea in the afternoon if I requested it. He also produced a very simple lunch from the buttery, consisting mainly of a large whole wheat roll with cheese and butter plus a piece of fruit. Breakfasts and dinners—by candlelight—were taken in hall. Chapel, which I came to enjoy attending on a regular basis, preceded breakfast. In order to combat the permeating cold, it was advisable to jog for about an hour after rising. This had the desired result of keeping my body warm for the day and the added benefit of helping me prepare for crew. My first-year room faced south. In the few sunny days, especially during the spring, my room became warm and stayed warm into the evening. It became a gathering place for those who knew that cookies and tea would be available and that discussions could extend to the late night hours.

Rector Munro, a classics scholar, was the nominal head of Lincoln College during my years. He did not have much contact with students outside his field. We saw him mainly in the hall, where he officiated at the high table and administered a 20-second-long grace in Latin (I timed it) each night at dinner. My dealings were mainly with Professor Sidgwick, whom I saw from time to time, although he turned me over to Dr. Leslie Sutton, his former student who had become a Don in Magdalen College, for the direction of research. Together, they suggested a list of chemistry

books for me to read and chemistry lectures that I should attend: Cyril Hinshelwood on physical chemistry, Robert Robinson on organic chemistry, Neville Sidgwick on inorganic chemistry, and Leslie Sutton on atomic structure and valency. Both Sidgwick and Sutton had spent time in the United States and were friendly toward Americans. They were critical but patient with me and became strong supporters when I had finally proved myself (or improved myself) after two years. The Bursar of the College, Keith Murray, became a very good friend. He also liked Americans and took Leslie Epstein and myself under his wing. Keith took me to an Agricultural Fair, and he drove several of us up to London to see Gilbert and Sullivan performances. After World War II, he became the Rector of Lincoln during a period of very effective growth. I kept in touch with him until he died—he was 10 years my senior—and eventually all of our family members became Keith's friends, as later chapters will reveal. He was a great supporter of music in Lincoln College. John Hough, who was the organ scholar, i.e., organist, in Lincoln had me singing for him on the first evening we met. We happened to be seated next to each other at dinner in hall when he asked, "Which of you is Leonard?", for he had ascertained from the admissions officer who among the incoming students had musical interest and experience. I produced some sacred music I had brought to England, and we had a brief audition in the chapel. He did not appreciate my selections, however, and he suggested some Handel, Bach, and Purcell solos for sight-reading and study. John sang tenor and counter-tenor and could play any instrument. He had a virginal, a viola da gamba, a viola d'amore, and recorders in his room, where there was always the opportunity for music. Through performance, I absorbed baroque and early renaissance music as well as church cantatas and sections of oratorios. John was a thorough musician and a subtle teacher. He raised his "pupils" to performance level before they knew what was happening.

Since mention of Lincoln personnel had introduced the subject of **music**, let me continue with it, because music became an important part of my life at Oxford. John Hough organized a first-time choir in Lincoln, consisting of eight male voices. We assisted in evensong and occasionally gave Sunday evening recitals as well. These became more popular as our enthusiasm and competence improved, and the audience, who sat in the candlelit chapel stalls, swelled when early instruments were used in accompaniment. The choir performed from the organ antechamber of the chapel. Our choir also performed in the Brasenose College chapel on several occasions. I became a regular soloist, learning the literature for solo baritone thereby. I joined the Oxford University Opera Club to sing in the chorus for the end-of-first-term performances of Purcell's "Dido

and Aeneas.” At dress rehearsal, I was called upon to substitute in the title role. Opera is never a financial success. In February of 1938, the Club presented a French play to try to make up our deficit. I had the role of a silent waiter, which I played in black face. At a concert late in 1938, the men in the Club sang the “Liebeslieder Waltzes” of Schubert. I became the “Hon. Sec.” of the Opera Club for the 1938-1939 academic year. The Hon. Sec., unlike the President, does all the work. My job was to arrange for the performances of “In Windsor Forest” by Vaughan Williams and “Father and Daughter” by Percy Grainger in concert. In retrospect, our activities were not very ambitious. They were circumscribed by lack of funding and the shortness of the terms—eight weeks—for rehearsals.

By contrast, the Oxford Bach Choir practiced during two terms for a performance. Dr. Thomas Armstrong was the conductor. In our performance of the Bach “St. Matthew Passion,” there were about 300 in the chorus and 100 in the orchestra—not exactly the army of performers that Bach had in mind—which did not leave much room for the audience in Christopher Wren’s Sheldonian Theater. It went very well (twice) and all of the occupants of the Theater were pleased. I would go so far as to say that the pleasure could be equated with enraptured enthusiasm. Edward Manning sang the tenor recitatives most clearly and expressively. I had started singing lessons with Mr. Manning at the end of January, 1938, and would continue to study with him until it became time for me to return home. From the Bach Choir’s performance of the “St. Matthew Passion” until today, this Passion is my favorite piece of music. I appreciate it most when it is presented in two parts, consigned to morning and afternoon as it was there in Oxford. The second major Bach Choir concert that I remember was one that included the “Sancta Civitas” and “Benedicite” of Ralph Vaughan Williams. Dr. Armstrong (later knighted) prepared us, but Vaughan Williams himself conducted. He was a gruff, amusing man who became visibly pleased when we responded well to his direction. It was a memorable occasion for me. I mentioned my singing lessons with Edward Manning which, incidentally, cost about \$16 for 10 lessons. He was a tough task master and an excellent teacher. He was not too enraptured with either my voice or my repertoire at the outset, but he produced desirable improvements in both. I appreciated his musicianship, and I was called upon for more recitals and concerts as I progressed.

One of the most satisfying musical experiences occurred when John Hough and I and four others went to entertain in the tiny village (300) of Little Compton, in the Cotswolds. In the little kerosene-lit village hall, we gave them everything from a penny-whistle solo to operatic arias. The audience took it all in and were more genuinely appreciative than

any other audience I have known. We were treated to dinner at the antique-filled home of the lord and lady of the dominant manor. That dinner produced one of the most ludicrous experiences of my life. When we had assembled for dinner, we stood behind our chairs at the table for the saying of grace. I took the opportunity of testing the back of my chair for stability since all of the antique furniture looked fragile. The other guests apparently did not. After grace, they pulled back on their chairs, but the backs of the chairs were all that moved! Imagine the scene in which half of the people at the table were trying to put their chairs together again so that they could sit down. Imagine, too, that all of the action was proceeding silently, the guests in embarrassment and the hosts in undemonstrated concern. I chuckle as my mind recreates the scene 60 years later.

Musical life in Lincoln College improved in the fall of 1938 when a Rhodes Scholar from North Dakota, Leigh Gerdine, came into residence. He had a baby grand in his room, was most gracious about playing for anyone who stopped by, and was willing to be my accompanist when I was trying to learn new music. He was, like John Hough, an advocate of making music for music's sake. He and I had also ample opportunities for doing more music together later when he was at Miami University in Oxford, Ohio, and then when he was Head of the Music Department at Washington University in St. Louis, Missouri. On May 15, 1939, at an evening of music at Rhodes House, Oxford, Leigh Gerdine played piano (Rachmaninoff) and I sang three selections (Bach, Grieg, Schubert) accompanied by John Hough, as the saved program indicates. My last selection was "Der Erlkönig," which I had practiced for weeks and weeks with Edward Manning and by listening to Alexander Kipnis on the gramophone. According to a letter to my mother, it went "quite well" and John Hough's accompaniment was "marvelous." We performed Liszt's "Du bist wie eine Blume" as an encore, from the favorite love poem of Heine. The same letter (of 5/16/39) indicates that I had started to learn the "Four Serious Songs" of Brahms, which Leigh and I finally performed years later in recital in St. Louis. Back in May of 1939, the second part of the musical evening included syncopation and songs at two pianos by Steve Bailey and Frank Taplin and a funny and clever burlesque of opera called "Saut," for which Frank was the "Chorus and Orchestra." Both of these scholars have had distinguished careers, Steve in academic life and as sometime mayor of Middletown, CT, and Frank as a director of companies and, for many years, a board member and then president of the Metropolitan Opera Association. I now see Frank at meetings of the American Philosophical Society, and we reminisce. He has maintained his

pianistic skill to the extent of playing Beethoven piano sonatas for select audiences.

There were ample opportunities for listening to music in Oxford: organ recitals, chamber music, baroque music (the Dolmetsch family), concerts (including Fritz Kreisler), musicals, Christ Church Cathedral and New College Choirs, and records borrowed from the Gramophone Society. Related to the musical offerings were those of the theater. The Oxford University Dramatic Society (O.U.D.S.) had a full season of well-executed drama. Traveling troupes of actors frequented Oxford. Some college clubs presented melodramas, in particular one in Magdalen College, in which my very good friend Tony Hugill was involved. Stowe School, an exclusive preparatory school, put on Christmas plays, e.g., A. A. Milne's "Fourth Wall," in good style. I was introduced to Shaw, Ibsen, Priestley, more Shakespeare, and the Gilbert and Sullivan operettas. There is frequent mention of movies in my letters, including those of France, Germany, and England which provided new experiences. The Hollywood films that found their way to England were usually presented in two parts in those days, separated by an organ interlude. Smoking was permitted in the balcony, with the result that the second part of the film appeared through a bluish haze. Due to the shortage of women in Oxford (actually, ladies, to draw the distinction), we usually went with one or two male friends after having had dinner together in one of the colleges as host or guest. The "flicks" were much more part of my life than they had been at Lehigh.

At Lehigh, I had carried out simple **chemical research** as a senior using small-scale, ground-glass, Pyrex apparatus in the private laboratory of Professor Vahan Babasinian. At Oxford, I was to carry out complex chemical research using medium-and large-scale, soft-glass apparatus on one section of bench in a large, poorly-lit, unheated laboratory. We kept the Bunsen burners going on the coldest days, which was hazardous because of all the organic chemicals that were being used. Fires we had, and small explosions, but we became adept at dealing with these. There was good comradery in that ground-floor room in the Dyson-Perrins Laboratory on South Parks Road. Norman Davidson had the greatest thirst for knowledge and prowled the laboratory to make sure he knew what everyone was doing. Antony Hugill, who was also skilled in mathematics, enlivened our work with quotations from drama and melodrama. John Hunter invented the mock-heroic "all for science" pose that became the signature of the laboratory. I entertained myself by singing until objections called for a halt.

There was no place to sit down in the laboratory. This situation stimulated an intensity of labor, but not the prolonged concentration that

is necessary for real accomplishment. I struggled with the first project that Leslie Sutton had assigned me. It involved organic synthesis which, if successful, would be followed by electron diffraction and mathematical calculations—excellent training. My letters home in which I repeated that research was not going well must have been distressing to my parents, who had no notion of this phase of science. The difficulties were indeed distressing to me but provided good, and not unusual, experience. One learns to persevere and eventually surmount such difficulties. In retrospect, the first problem could not have been solved with the conventional apparatus that I had available. With mentor wisdom, which I learned to apply in later life, Dr. Sutton added a second problem. The home-bound letters indicated that laboratory work was going better in the second term, but continuing letters revealed that there were more “downs” than “ups.” I was experiencing the general trend of most original research. It was not until my second year that I modified the second assignment when I discovered its potential sources of error, assimilated the parts of the problem, and found time to work uninterrupted in the laboratory. The word “exciting” to describe the research was first used in March 1939. The experience is a common one and was to be repeated over and over by the graduate students who came under my charge at the University of Illinois. I qualified for an Oxford B.Sc. Degree, which was like a master’s degree in the United States, but I did not have enough residence time by September, 1939, to qualify for a D. Phil. The research work was published after the war when the article was composed in the summer of 1947 during a brief visit of Leslie Sutton to the University of Illinois. The Oxford D.Sc. degree awarded in 1983 had to compensate for the D. Phil. made impossible by the onset of war.

The lecture courses were given in term, and additional reading was expected in the vacations. Visiting lecturers included Professors Debye and Pauling, both Nobel Laureates. Seminars were notable for the free interchange among all attending. Some socializing with the chemistry professors and dons was possible. They were all friendly and interested in students, not only their own. I recall tea at the Suttons’ home, especially one in which Mrs. Sutton, who was an accomplished organist and pianist, and Tony Hugill played a Haydn Symphony transcribed for four hands at the piano. I also recall a luncheon with Keith Murray and Professor Sidgwick during which we were seeking a definition of “culture.” The Professor decided that it amounted to total immersion in one subject. This was an intriguing comment from a person who had “gone down” from Oxford with a degree in Chemistry, had found his scholar-father unimpressed, and had returned to Oxford to take a fast degree in “Greats”,

i.e., Classics, obtaining a first (highest rank). I felt there might be some personal implication to Sidgwick's definition, since I was dividing my time among music, chemistry, and sport.

My **sport** at Lehigh had been soccer for all of my four years. I had thoroughly enjoyed it, although neither my playing nor Lehigh's team playing was distinguished. I did not continue playing soccer (football) at Oxford because all the British players were too good. There was only one time that I was dragooned into playing—with the chemistry students versus the chemistry service staff in March of 1938. I managed to kick one of the goals that enabled us to end with a 2:2 tie score. A fortunate outcome of the event was that my legitimate requests of the service personnel received more polite and prompt responses, even with some joviality. Up until that time, I had perceived the requests of another bloody American to be a nuisance to the staff.

The idea of working while sitting down appealed to me. Shortly after my arrival at Lincoln, Jack and Devereux Milburn, from a famed Long Island family and themselves accomplished oarsmen, convinced me that I should try out for the Lincoln crew. First, they would coach me. As beginners, we rowed up and down the Charwell in "tubs," heavy boats carrying two oarsmen and the instructor. It was very pleasant to be on the river in the late afternoon, for by that time the sun had usually appeared from behind the mist. After three weeks, I rowed in an eight for the first time, but we "freshers" were not able to keep it very steady, and there was no increase in steadiness in the course of that first afternoon. However, four days later, Lincoln's would-be crew paddled approximately seven miles on the Thames. After two weeks, we were up to 14 miles and practicing racing starts. The possible conflict with the Opera Club activity was resolved when the director, Bernard Naylor, excused me from afternoon rehearsals for the chorus and ballet. The next stage was rowing about seven miles at a good pace, e.g., up to 34 strokes per minute. I was moved up to #7 position, the leading oar on the bow side. The next exercise was rowing a 1.5 mile course on the Thames between Iffley Lock and Folly Bridge and learning that no one in the boat can give up. This was a kind of "graduation." We lost our side-by-side race to Christ Church by about five feet after leading them substantially over the first part of the one mile-plus course. My next rowing came in the third term, but we started practice earlier in March in a shell. Until that time, we had been rowing torpids, the heavier boats. I had become addicted. The afternoons on the Thames became an important, pleasurable part of my life. I also practiced rowing in a pair with Ronnie Tomlinson in order to improve balance at a higher stroke rate. Neither of us had the time for additional

hours of practice; otherwise, we might have entered competition. The same was true in 1939 when I rowed with Jack Milburn (he died on D-Day) who was a more accomplished stroke. In the May, 1938, Eights Week races, I rowed #5 and enjoyed the nickname they gave me, "the engine." Bumping races are very exciting. It is a question of catch or be caught, or neither. We were bumped once during the six-day period (Thursday, Friday, Saturday, Monday, Tuesday, Wednesday). I received a huge scarf for rowing in the Lincoln first eight, and the Rector invited us to dinner. He was forgetful and did not know what to do when confronted by eight crewmen and one coxswain, all dressed in tuxedos, on the appointed night. Mrs. Munro rescued the situation by informing us that the dinner was really scheduled for the following night.

We reappeared, determined to enjoy ourselves. To encourage conversation at the dinner party, a stimulant was devised that may have been used on other occasions. A neutral party wrote down statements of unusual content on nine separate pieces of paper. After these had been scrambled in a hat, each of us drew one and kept the statements secret from the others. The object was to try to incorporate the selected statement as a direct quote into polite dinner conversation. In practice, as we listened to each other, we tried to guess whether an individual's conversation was leading in the direction of his possible quotation. Then, we would interrupt as politely as possible with something like, "That reminds me of . . .," whether it did or not, aiming in the direction of incorporating one of our own quotations. The conversation was animated all through dinner, and several ridiculous statements made their way into the general hubbub. Mrs. Munro was beaming. Finally, Rector Munro won the day with "Have you seen my daughter's bust?" We felt that he might have been playing the game also! The three boisterous Americans on the crew found it difficult to contain themselves, myself included. However, the Rector's statement was in reality an invitation to go into the lounge for coffee following the dinner. There was the bust by the famous sculptor, Jacob Epstein. When I speak of boisterous friends, I am reminded of a night when several of the crew returned to Lincoln from a beer party and, finding only my light on, they paid me a visit. Their hilarity continued as they played "shipwreck" with my room, swinging the lamp and tilting the table and chairs in ever increasing arcs, corresponding to the growing intensity of the imaginary gale. I looked on in consternation, attempting to quiet the storm. The ship wreckers proved to be contrite, however, for they provided me within the week with an attractive overhead lamp and a new table and chair. The newly outfitted ship encountered no further storms.



NJL, Oxford, 1939



NJL, at #7, Lincoln College Crew

The Lincoln crew improved by the second term of the 1938-1939 academic year. We sat at a separate table in dining hall and enjoyed an improved menu that included frequent offerings of steak. We bumped successfully twice during the six days of racing and thus improved our standing on the River for the future. In the spring term, we did even better, bumping whichever boat was ahead four times in six days and moving up accordingly in standing. The pleasure of displacing the boat ahead was an experience to be savored. I again rowed #7 behind a new, very steady stroke. I was offered the opportunity to try out for the Oxford University crew, but that was not to be. I gave up my chance (*one* was afforded to Lincoln College) to the stroke, who was second on the list. Unfortunately, the onset of war in September removed all such pleasant possibilities. I was in great physical shape at that time. Now, in 1998, I have about the same weight, but the proportion of muscle to fat, etc., has decreased. At the end of Eights Week in 1939, our crew and the crew of the second Lincoln College shell were given a luxurious dinner by our Bursar, Keith Murray. The location was the Fellows' private dining room. The seven courses were served on the beautiful 16<sup>th</sup> and 17<sup>th</sup> century college plate and service. We were all most grateful. If we had made six bumps, that is, bumped each day, the whole college would have celebrated in this manner, according to tradition! During the terms when I was not rowing, squash and cycling filled the need for regular exercise. The Lincoln College squash court, completed in January, 1938, was close to the Dyson-Perrins Laboratory; accordingly, ducking out of the lab was possible when some chemical reaction was being stirred for a reasonable length of time. The first bicycle I had was second-hand, three-speed, and frequently repaired. The replacement bicycle was new, also three-speed, and it had a racing handlebar of which I was very proud. It traveled

many happy, picturesque miles. It only suffered two minor accidents, one from being walked into by a pedestrian and the other from being run into by another bike.

How did I make **friends** in England? There were those with whom I became associated in music, chemistry, and rowing. There were neighbors who had rooms in the back quadrangle of Lincoln College and with whom I shared tea and food and late night discussions. There were some English student colleagues who were amused by Americans and went out of their way to be hospitable to us. Chief among these Lincoln friends was Rodney Parsons, with whom I forged a life-long friendship that became extended in time to our wives and children as well. My first visit to an English home came about through a friend and near-neighbor of my mother, a Mrs. Monks, in Mount Vernon. The invitation came from her second cousin, Mrs. Cumber, who lived in Theale, a town just west of Reading. The distant connection between host and invitee says something about both friendship and trans-Atlantic travel in the 30s, or perhaps my late October weekend was just a balance for the hospitality the Cumber's oldest daughter, Ellen, had received during a visit to the United States. In any case, I welcomed the time away from my captivity in Lincoln College, obtained by permission from the Senior Tutor. Theale, reached by train from Oxford to Reading and local bus, was a beautiful village of a thousand inhabitants in those years. "The Chestnuts," which was the home of the Cumbers, was a remarkable English country house that derived its name from the row of chestnut trees which flanked the front rose-trellised wall. The gardens were extensive and beautiful, with a grass tennis court in the midst. A stream separated the rear garden from the meadows where sheep and cattle grazed. Mr. Cumber was an alderman of Berkshire County and owned innumerable tracts of farm land all around Theale as well as the village meat market that had been in the family for 300 years. The family itself could trace its residence in Theale to the 11<sup>th</sup> century. John, the only son and a graduate in agriculture from Glasgow University, took me on a tour of the pastures and of the scientifically-run dairy farms. He remained in charge of the enterprise until he died sometime late in the 1980s, at which time his sister Ellen took over the operation. The farm-family tea was in the form of a regular meal set in the dining room and was served when Mr. Cumber came in at the end of his work day, a Saturday. Before supper, the younger group consisting of John and the two younger sisters was augmented by a brother-in-law, Leslie Strang, a chemical engineer who worked for one of the British-foreign oil companies (later, BP), and a cousin, Kitty Sparvell, who had completed a course in domestic economy at Reading University. I wrote to my mother, "Kitty is a blonde, very attractive—I really hope to see her again because she is one of the most

attractive English girls I have seen thus far.” Leslie must have thought so as well, since they were married after the war began. Leslie and Kitty were to remain good friends of mine for many years from the time we met again after the end of the war. During supper, which consisted of meat pie and salad, Ellen Cumber arrived from London, and afterwards the “young people” played the English version of Monopoly. Somehow, the conventional game became more exciting because the wild American suggested all manner of trades and sales of property on the side. I think the others were a bit baffled.

I am writing in detail about this weekend because it describes the habits and mores of a segment of the British population at the time, as well as my own personal experience and one origin of lasting friendships. It was a new experience for me to place my shoes outside the bedroom door and find them polished on Sunday morning. It was also a new experience for me to go down to breakfast and not to see the family in the dining room. The table was set for breakfast, but I saw no one until my gaze rested on the chairs that had been drawn back from the table. A family member was kneeling beside each chair. I slipped down next to the only empty chair and listened to Mr. Cumber’s lengthy prayer. Leslie Strang told me later somewhat irreverently that the prayer had to be long to atone for the high prices charged at the meat market during the week. We all went to the Chapel for a children’s day service and returned to what I called “the best dinner I had had in England.” After dinner, I took a walk with John through the meadows, where he showed me the prowess of his sheep dog, “Mac”, and he extricated a sheep from the brook behind the house. Then, Ellen took me for a ride in her little MG (there were four cars in that family) all around the countryside near Theale, returning to the house for tea. It was then back to Oxford for me in time for “hall.” I hosted a theater party in Oxford two weeks later as a response to the Cumber hospitality. Ellen and John Cumber, together with Kitty Sparvell, came up from Theale for a tour around Lincoln College, dinner at the Clarendon Hotel, and the comedy, “French Without Tears.”

I was invited to Theale again, this time for Christmas, 1937, before I departed England for a skiing vacation in Seefeld-in-Tyrol, Austria. When I arrived at The Chestnuts, I found Ellen to be engaged in gilding radiators because they had just installed central heating. I had had plenty of experience at this when I was an underclassman living in the fraternity house at Lehigh, so I took over the chore. The house was decorated with ivy and pine and some wreaths, but no Christmas tree. Stockings were hung by the fireplace, but John used an old potato sack and Ellen a pillowcase, with predictably unhappy consequences. We exchanged small gifts, but I was most content with the loan of a pair of John’s ski boots that

fitted me perfectly. After a Christmas sermon and service in the Chapel, followed by a light lunch, Mr. Cumber took John and me to a very good professional soccer match between Reading and Swindon Town, won by the former 2 to 1. We returned for tea, at which Kitty and her father and mother were guests, along with other members of the family. After a suitable time interval, we had a traditional Christmas dinner: turkey, stuffing, sausage, vegetables, potatoes, pudding, fruit, nuts, and strong cheese, all with second helpings. Then, after dinner, the minister and his wife, who played organ and piano, arrived, and we sang carols all together for the rest of the evening. I felt welcome and so enriched by this Christmas experience!

There were new friends to be met on the Ski Club Tyrol's outing to Seefeld, Austria. Assigned to Chalet Artus, I was put in a room with two others from Oxford, David Harris and Adam Curle of New College. They were good pals and were not happy to have a stranger



Skiing in the Tyrol. David Harris is to NJL's left

crowded in their room, especially an American of unguaranteed behavior and habits. Nevertheless, when they discovered that I behaved myself and tried to be considerate without interfering with the life of their ski group, they accepted me and began to include me in their evening parties at cafes where there was dancing. David and I were on the same learning curve as beginners in skiing. He was an exceptionally fine person, and we became good friends during the 1.7 years that remained for us both at Oxford. My youngest son is named after David Harris, who lost his life while a tank commander during the conflict in North Africa. The Ski Club members, although assigned to sleeping quarters in various chalets, came together for lunch and dinner in the Hotel Karwendelhof, thus providing opportunities to meet and talk with others in the group. Bob Harmon and Bruce Waybur, Rhodes Scholars of my year, were also in the Club. Later in January, we had a reunion of some of the Seefeld "veterans", complete with Austrian recordings and with some of the girls in Tyrolean costume. The evening was so enjoyable that we decided to have regular get-togethers. In order to justify our existence, we (about ten of us) decided to adopt a Basque child (in France) at ten shillings per week. It will be

remembered that in the ongoing Spanish Civil War, the German Air Force “assisted” Franco by bombing civilian targets in the northern, Basque territory, e.g., Guernica. We then became the AAFTSOABC—Anglo-American Association for the Support of One Basque Child—at dues of one shilling per week, and we had many agreeable meetings in the name of our orphaned child, for as long as Austria (our ski home) remained free. Of that group, it was David Harris who remained the closest friend. Other friends were made during subsequent vacations, and their names will be found in appropriate sequence in this narrative as the contacts developed.

There were serious attempts by the Rhodes Trust and the friends thereof to help acquaint the Rhodes Scholars with Britain and the British. At the end of Michaelmas Term, December, 1937, we were treated to “London Week,” a series of social engagements that now almost certainly belong to a bygone era. That is exactly why they are worth recording—for a taste of London social life before the second World War. Les Epstein and I took up lodging in a private boarding house in Kensington Gardens Square (bathroom down the hall). Our first event was a soiree in the home of Miss Macdonald of the Isles. There in Cadogan Square, we were entertained by a soprano soloist, violinist, and several people who recited. All this was interspersed by group singing and followed by a light supper. Morning was set aside for the British Museum, where Les and I spent all our time looking at the products of archeological expeditions to Egypt and the site of ancient Babylon, while telling ourselves we would have to make many return visits. We took luncheon with those of the English high society and friends—a Mrs. Anstey, deaf but a very interesting conversationalist, and two young misses who kept us “entertained” with tales of hare and hound. After luncheon, we were guided all around Parliament by Sir Francis Freemantle, who had been a member of the House of Commons for 18 years. He was an interesting guide and a jolly fellow, and he invited us to tea.

After tea, we rushed off to dress for dinner at the Clothworkers Company. This is one of the twelve London City companies. It was originally a trade union of clothworkers, but is now a society of sons of sons, etc., of clothworkers; that is, inherited members. It is a tremendously rich organization, the chief functions of which are to give away money and to entertain. There is a master or president, and said master always gives the Company a beautiful piece of gold or silver plate upon completion of his term. Since the Company was started in 1528, there is a terrific amount of gold and silver lying about and being used in the serving. The honored guest of the evening (there were always “honored guests”) was Princess Maria Louise, cousin of King George V. There were over 200 guests, of whom probably 120 were Rhodes scholars and dominion

students, at the feast. According to the preserved menu, there were oysters, clear turtle soup, lobster, sweetbreads, saddle of mutton, mousse of ham and truffles, iced soufflé praline, petit fours, cheese savories, dessert, and coffee. Among the six accompanying wines or liqueurs were a Madeira of 1877, a sherry of 1899, and a port of 1912. The lady to my right was holding forth, complaining about teetotalers during at least three courses, when she suddenly and belatedly noticed that my wine glasses were all turned over. I enjoyed the shocked, unbelieving look on her face, but I let her off the hook by stating that I was in training for crew. We were entertained following the dinner by speeches, a soprano soloist, and a mental telepathy demonstration.

The letter written to my mother on December 10, 1937, describes a walk through Hyde Park on the next (foggy) morning and taking Kitty Sparvell to see a rugby match at Twickenham, Oxford 17—Cambridge 4, in the afternoon. We sat with a group of Lincoln boys who murmured sporadically, “Well played, Oxford” or just “Oxford.” I yelled very worthwhile encouragement, such as “Come on, boys,” or “Let’s go,” but I didn’t indulge in “Kill them,” a sometime accompaniment of American football. After tea and seeing Kitty off at Paddington Station, Les Epstein, Fanny Fowle, and I went to the Royal Opera House for a production of “The Barber of Seville” in English. The next day included a visit to the Tower of London; lunch in the home of a wealthy philanthropist, a Mrs. Henderson, a collector of Chinese antiques; a visit to the General Post Office and the tiny postal subway 80 feet below street level, where mail is whisked around and bags are set off at all the principal postal district stations, and the International Telephone Exchange center; a formal dinner with a Mrs. Nauheim, who provided three young ladies for Epstein, Fowle, and Leonard to escort to the Goldsmith’s Ball (another ornate City Company); and a visit to Covent Garden to watch the arrival of flowers and vegetables at 3 a.m. Les and I were in bed by 4 a.m., rising in time for lunch and a bus trip to Windsor Castle, guided by Mr. Morehouse, the King’s personal librarian, and to Eton, concluding with tea with Lord Hugh Cecil, Eton’s Provost. Dinner in the Strand Corner House and then a variety show at the Windmill Theater owned—or at least partially owned—by Mrs. Henderson concluded the strenuous London Week.

Then, it was back to Oxford for the strongly contrasting period of laboratory work during the vacation. For non-science students, the two six-week vacations and the three-month summer vacation were generally used for reading at home plus some travel. For laboratory science students, some three to four weeks immersion in practical work was necessary in the short vacs, and two to three months in the long vac. The college

facilities were not available during the vacations; accordingly, I moved into “digs,” generally into a small house in Tackley Place, North Oxford. The rooming house that I favored was run by a Mrs. Brucker, widow of a highly thought-of preparatory school teacher who had died much too early to have provided an inheritance income. With limited kitchen facilities—an English problem in those days—she managed to provide hearty breakfasts, hot meals at noon, and suppers consisting of soup, cold meat, fruit, crackers, and cheese. The charge for room and board was 35 shillings (about \$9) per week for the four regular boarders and the two students who were boarding during the vacs. The very proper menage was run on a punctual schedule, for there was only one bathroom. When I caught a cold that developed into laryngitis, Mrs. Brucker was very motherly. There was a hot Ovaltine provided at bedtime, and I would find my pyjamas wrapped around a hot water bottle that was placed in my bed. When I finally had to remain in bed, hot lemonade and meals and the usual medications, aspirin and Vicks, were brought to me.

There were two other members of the household who became my friends: Spot, an overfed terrier, and Tobias, a tiger cat. When I occupied the single bedroom on the first floor, Spot could detect when I would lie down in bed. He would push his way through the weakly latched door for his nightly back scratch. I didn’t have to do anything, however. The sagging springs of the bed with me in it were just the right height for his back as he walked to and fro underneath until he was satisfied. Tobias used me in a different way. He normally slept quietly in the garden, but especially on moonlit nights he seemed to adopt a different persona. He would leap up onto the sill of my open window and pose silhouetted against the full moon. From there, he would pounce upon my bed, knead a spot to curl up, and settle down purringly for part of the night. He was always gone by morning.

As I have been reading through the letters after these many years, I have been analyzing the character of one NJL almost objectively. From 1937 into 1938, he seems impressionable, unfocused, and even uncertain as to what he is supposed to accomplish at Oxford. I am a little impatient with him because he is not being selective among *all* of the opportunities, among the people with whom he spends his time, about the English habit of taking tea, about a political stance in a crumbling world. Perhaps he is in the process of sampling everything and everyone and will soon make up his mind on major points. I should be more patient with him. A letter of February 10, 1938, included the following:

*“Oxford must be growing on me. I thrilled at the sight of the towers and spires under the beautiful moon this evening—white clouds*

## MORE THAN A MEMOIR

*skipping across the silvery sky. I am truly a fortunate boy (sic, at 21!) for I do appreciate everything about this place."*

Later, in the month, the February 22, 1938, letter stated:

*"... I feel I have found my place, for I am kept busy with my own circle of interests and friends."*

*"For such is the source of research; I am merely testing myself to see whether my interest withstands difficulties and disappointments and plain laziness. I think it shall (sic)!"*

*"My politics are becoming more socialistic in proximity to . . . Europe's dictators."*

Finally, a letter of April 10, 1938, gave me reassurance that NJL was acquiring purpose:

*"I feel now as though I am putting behind me pride in small honors and happiness in the praise of friends and relatives—and modestly, earnestly attempting to build a pattern and a purpose for my short life on earth. I feel that I am a grown man in that I now realize that the problem that confronts me is the problem of life—not temporal and varied problems of temporary aims and successes—but the problem of using all the scientific knowledge that I can gain for the benefit of people—for you and Dad, and for people in general. All my time now must be spent in building up that knowledge, in building up, then, more strongly my spiritual and moral character, and in determining helpful political and philosophical convictions to guide me in relations with people."*

Well, now we are getting somewhere! In the meantime, there was a spring vacation to be taken for pleasure after living the first half of it at Mrs. Brucker's and in the Dyson-Perrins Laboratory. Jean Harris, David's sister, drove down from Staffordshire, to return with David, who had also been studying after term, and me. I met their parents and saw their wonderful house, named "Washdale," in Stone, Staffordshire. We toured and hiked in Staffordshire and in neighboring Derbyshire. Then, we took the train to London to see the Oxford-Cambridge boat race on the Thames River (about 4.5 miles). The race is probably important to view once in a lifetime, which we did on this occasion from the glass-enclosed roof of a house situated advantageously just at a bend in the river, with good visibility

to both east and west. In 1938, Oxford won by two lengths in very rough water, so rough that both crews had water up to their ankles by the time the race was over. After seeing a play in London with four members of the Cumber family, John Cumber drove us to Theale for a quiet weekend. I sang a solo in the Theale chapel as a kind of payment for the continuing Cumber hospitality. From Theale, it was on to London and thence to Harwich by boat train for the overnight crossing of the North Sea to Hoek-of-Holland. It was arranged that I would stay as a paying guest in Naarden with Bob and Grace Vermey. I referred to Grace as "Aunt Grace." She was the daughter of one of my mother's good friends whom I had known since early boyhood. Bob and Grace had four daughters, of 13, 11, 10 and 1½ years, and there was help in the house, especially for the "baby." Our common language was a mixture of Dutch and English, although Bob spoke German, French, and Spanish as well.

Should a reader be interested in such details? Probably not, but patience will be rewarded since this Vermey family proved the means whereby my destiny—or a good part of it—would be fulfilled. It was in my romantic nature to approach everything and everybody with an open mind and open heart. Impressions of my two weeks with the Vermeys were concentrated on the beauty of the towns and countryside, the food, the people including friends and in-laws of Grace, bicycling, inventing games for the girls, movies (French), the Dutch Reformed Church on Palm Sunday (very serious, two sermons), and, finally, Henri Vermey, Grace's brother-in-law, and two of his daughters and their mansion in 's Graveland, North Holland. In my letters to my mother, at first I did not even mention the names of Grace's nieces, Louise Cornelia (Nell) and Hilda, the youngest. The oldest sister, Els, was in Paris at the time, learning Russian in the home of some emigrés. In the successive letters to my mother, I spoke of "the nieces," "the very attractive niece," then "Nell" and "attracted by that lovely niece again," and, when I had returned to Oxford, "Nell, the blue-eyed, captivating niece." I suspect that mother was capable of reading between the lines. When I left home, she had expressed the fear that I would marry while I was abroad and would never return to the U.S. I was probably breaking the news of my attraction carefully so as not to alarm her. However, my attraction really occurred more precipitously. Here is my best recollection of what happened.

Henri Jacques (Hein) Vermey had shown up in Naarden for a lunch, I believe, to size up the American who was visiting from Oxford and to see if it would be agreeable (and safe) to introduce him to his daughters. I was invited to Westerveld, the name of their house, to play tennis. I cycled to 's Graveland—I had rented a bicycle for my two weeks—and I

was invited in and asked to wait in the library for the family to appear. Nell was the first to enter. She was in a tennis costume and had played a set already. I was overwhelmed by this figure of healthiness: a tall, beautiful blond with rosy cheeks and deep blue eyes that seemed to peer into your soul. Her English was perfect; her manner, most gracious; her lips, sensuous. I had never been so affected by seeing anyone for the first time. I thought, "Oh, no, this can't be happening to me! I'm too young! I'm only 21! This is the girl I've got to marry! I wanted time to look around, to travel, to explore, but now I have to spend all of my vacations with Nell, trying to convince her that I am worthy of her." And that is what happened. It was also early in life for her. Nell was only 18.

Hilda was a good tennis player for her age, Nell was excellent, and her father was a real pro. Hein played to win at all sports. I was a tennis amateur, but I loved the game. I did better at ping-pong, and Hein taught me some of the finer points of billiards. Nell and I walked and talked along the canals, in the beechwoods, and among the heather. We took long bicycle rides in the beautiful region of Het Gooi. The tennis morning had stretched to two days or more and Hein drove us to see the bulb fields, the new airport, and an animal billed as "the fattest pig in the world" on one of the many surrounding farms. In the evenings, we listened to Nell's records and the old music box that was (and still is) a family treasure. When I was back in Naarden with Bob and Grace, Hein asked me to go with him for dinner and an evening of bridge at his parents' house in Bussum. Luckily, my bridge was up to Hein's expectations, along with the simple Dutch that I was taught as the game progressed. He took to calling me "old boy" by the time the evening was over, and we were good friends from that time onwards. Portraits of Els, Nell, and Hilda graced the wall of the grandparents' living room. The portrait of Nell, even at a young age, probably 13 or 14, was captivating. When Nell came to Naarden for a traditional performance of Bach's "St. Matthew Passion" (in two parts) in the old church, she had lunch at Grace's. Since I had just sung the work in Oxford, we had pleasure in going over the score, especially where Dr. Thomas Armstrong had shown the choir members the figurations in the musical notes as they appeared here and there, imaging the words as they were sung. What other contacts did we have? We went to see Greta Garbo in "Maria Walewska"; the whole family was together at Westerveld for the traditional egg hunt in the garden; I met a crowd of young people also at Westerveld, friends of the family, for an evening of fun and games; and there was a goodbye visit when Nell drove to Naarden and we planned how we would meet in the summer.

Nell was far from realizing that I was the man she was going to marry, but I was gratified that she liked me. She wrote to her mother Anna (Theodora Caesarina) about the young American she had met. Her mother, in a protective mode, suggested that I was probably interested in Nell only because of the fine house, the garden, and the tennis court, or at least that these symbolized wealth, which probably had been the attractant. "You know about those wild Americans! Didn't he misbehave?" When Nell was unmoved, even amused by her mother's reply, Anna countered that my father probably sat around the house in his undershirt. This class-conscious rejoinder, which Nell described to me, was made even funnier by my contemplation of my father, the fastidious dresser. He never allowed me to appear in a vest (waistcoat). I had to have a suit coat on as well. An undershirt? Not even to be mentioned!

Back in Oxford, I seemed to concentrate better on the trio of chemistry, rowing, and music during the spring term. There was some visiting and some entertainment as well. Rodney Parsons, a Lincoln student in chemistry, invited me for a weekend to his home in Hazlemere, Kent. The family consisted of his parents, an older brother, Tony, who was away at the time, and a younger sister, Rosemary, who was at school. Rodney's father was a gruff, practical fellow who had been a mining engineer in Rhodesia. His mother was very sweet and kind. She assured me that I would always be welcome in Hazlemere whether her sons and daughter were there or not. I did visit on several occasions, and I did get to know Tony and Rose and kept up with them until this time. The Parsons family had a manservant who unpacked my bag, hung up my suit, and placed the other clothes in drawers, all directly upon my arrival. It was a new experience for me. I remember walks and drives, meeting Rodney's friends, and visiting his aunts who always moved about in pony carts. They had no car or bicycles. I remember being coached by Rodney about what is appropriate to be said about a pony, so that this American would not make a gaffe. After all, what would you say about a pony to people who spent their lives professionally with the little animals? You do not want to appear to be utterly naive or to admire them only for their cuteness.

In May of 1938, I wrote of going to a formal dance together with Jean and David Harris and Adam Curle. It was necessary to be back in College by midnight, so there was always a mad scramble for taxis when such affairs were held during term. I had a luncheon party for this group plus our hostesses in my room on the following Saturday. My "scout" did the serving. The food was provided by Lincoln's kitchen according to my requested menu. This procedure proved to be a very impressive way of entertaining that I used on special occasions. In the afternoon, there was

punting on the Cherwell, the little river that flows into the Thames. Partying continued with a drive down to Pirbright, Surrey, where we distributed ourselves in the houses of some of the people with whom we had been in Austria during Christmas vacation. There were about 30 young people in all. We danced to gramophone and radio until the early hours of the morning. The house party ended on Sunday after tennis, ping-pong, walking, and eating—lots of eating.

We drove back to Oxford in David's car, about 50 miles. When we were about three miles outside Oxford, we were the first to arrive on the scene of a motor accident which had occurred just in front of us. One car had overturned, its wheels still spinning, and one car was in the ditch. Both were almost completely wrecked. David and I began extricating people from the upside down wreckage. First, there was a man who had bad vein cuts in his head and wrists. These I bandaged with four clean handkerchiefs I had with me. Second was a woman who was in shock and was a bit bumped. Third was a man uninjured. When we asked how many there had been in the car, the answer "four" made us dive in again to pull out the last one, unconscious. We thought he might be dead, but he was only bruised. His false teeth had cut his mouth and throat. To add to the general melee, a drunk from the ditch car—or perhaps he was just a passerby—was rolling about in the gutter. In addition, a motorcyclist ran smack into the wreckage. He was only shaken up, but he moaned a lot. David and I took two injured to the hospital, the hysterical one home, and we left the rest to cope with the constable. We reached our respective colleges just before midnight. I was useless in the inquiry about the accident when the judge determined that I, as a witness, did not even know the kinds of cars that were involved. I did try to make the point, unsuccessfully, that the dynamics of the collision could not be determined by the final resting places of the vehicles. The upside-down vehicle that was still on the road was judged at fault. I can't remember whether the direction the ditch vehicle was really traveling had been determined.

After I had spent five or six weeks of the summer vac at Mrs. Brucker's place, while working hard in the Dyson-Perrins laboratory, I was ready to travel. My mother had written to me early in the year along the lines of "Wouldn't it be nice if you could arrange a European trip with Ed Meury when he comes across the Atlantic this summer?" I had spent a lot of time finding out what sights we *had* to see, how we would move about, and where we would stay. The goal was to see the maximum at the lowest cost and still be comfortable. I shall record only the highlights. First, I ensconced Ed and his friend, Earl, a lawyer in study and later a judge, in our favorite (cheap) bed-and-breakfast in Knightsbridge, and I left them

to see London on their own while I returned to Oxford. I was their guide for the City and University and, by rented car, we caught glimpses of Oxfordshire and Warwickshire, including Stratford and Shuttery for the cottages of Shakespeare and Ann Hathaway, Kenilworth for the remains of the castle of John of Gaunt that had been destroyed by Oliver Cromwell; Warwick Castle, the home of the Earl of Warwick; and Banbury Cross, made famous by the nursery rhyme.

After all that, we were off to the continent, crossing Newhaven to Dieppe and then by boat train through family farm country to Paris, where we stayed in the Hotel Liberia in the Montparnasse section. We saw everything one is supposed to see in Paris and then more! The same was true in Geneva, Switzerland, where we stayed at the International Student House. I felt the long arm of my father reaching out because, while we were in Geneva, we were invited to hear a lecture (to students) by Salvador de Madriaga. He was an anti-Franco emigré author who had been the former Spanish ambassador to the U.S. and then to France. When he was in the U.S., he bought his specially tailored shirts—you guessed it—from my father in Saks Fifth Avenue. Señor de Madriaga was most gracious, most welcoming, and together we agreed that my father was an unusual gentleman.

Ed Meury and I were having a great time together, but Earl was in that “comparison with America” mood that seems to afflict some U.S. visitors when they are first confronted with Europe. They are unwilling to accept the differences, to relate to the history, and to enjoy the new experiences. Fortunately, Earl’s mood began to change in Geneva. At first, he thought the International Student House was a dump. I had only promised him that it would be cheap. He objected to the generally agreed-upon custom of speaking only French in the hostel. Some of us did not say very much, but we tried! Was it the attractive young ladies who were also staying in the hostel with whom we ate at the long tables? Or, was it the fresh experience of traveling around the Lake of Geneva on a ferry that docked now on the Swiss shore, now on the French shore of that beautiful lake? Whatever the answer, Earl mellowed, and the threesome became more unified in their approach to further travels. In Lausanne, early on a Saturday morning, we hired a boat and rowed out a mile or two from shore. There was a slight mist hanging over the clear, deep blue water. There was only one thing to do under those ideal circumstances. We took off clothes and dove in for an invigorating dip. Travel around Switzerland was reasonable because of our 8-day Swiss tourist tickets (cost, about \$10) which allowed us unlimited travel on the railroads and lake steamers. We continued on to Vevey and Montreux, with a side trip up the Rochers de Naye, then by

Bernese Oberland Railway to Interlaken and the Lakes of Thun and Brienz, and further to Luzern and Zürich.

During the overnight train trip to Vienna, we were the only people in the compartment. I slept (fitfully) in the baggage rack while Ed and Earl were stretched out on the wooden seats. Everything was fine until we stopped at Innsbruck, when three other people entered the compartment and all five had to sit up for the rest of the journey. I continued to sleep in the baggage rack. Any suitcases that the new passengers tried to place on my rack slid back down rather abruptly. We went on tours in and around Vienna, saw an out-of-doors presentation of an operetta, complete with coaches and horses appearing on the open-air stage, and spent a late evening on the Kahlenberg, the hill above Vienna, and at Grünsing for dancing, ending up in an all-night cafe near the opera in Vienna. The trip from Vienna to Budapest was by Danube steamer. One of my reasons for going to Hungary had to do with "currency equalization." My Lincoln College friend, Alidar de Balla, a Hungarian, had gotten into trouble in Oxford and had to borrow the equivalent of \$50 from me. Because of Hungarian currency restrictions, there was no way he could pay me back except within Hungary. I was thus on my way to a "free" vacation. Ali was the host and kept track of my expenditures. He was well off when in Hungary, so I felt he would be accurate in the accounting.

Our arrival in Budapest at about 10 p.m. was the most thrilling part of the whole journey. Budapest was beautiful at night and vibrant, with people walking about, especially along the Corso. The popular saying at that time was "Paris by day and Budapest by night." Ali gave us a memorable Hungarian meal and the proposed itinerary for seeing all of the important sites of Budapest, which we did in the days that followed. He even arranged for us to go tea-dancing at the Hotel Palatinus on St. Margaret Isle in the wide part of the Danube. The mother of one of the two charming girls came along as a chaperone, as was the custom at that time. On the next day, we all went swimming in an outdoor pool that had artificial waves: twenty minutes of waves, then twenty minutes of quiet. The swimming was sandwiched between lunch and tea. In Ali's mother's apartment, we were treated to a wonderful dinner. The final course really surprised us. After the ice cream and cheeses, we were served a huge platter of corn on the cob. It was eaten with sugar or honey.

The unusual things that we saw in Budapest included Ali's gymnasium or prep school, workers' flats which his father had built about ten years earlier, and villas and gardens on János Hegy, the hill overlooking the city—all of these in addition to the usual tourist sights. Leaving Ed and Earl to fend for themselves in Budapest, Ali and I went by train down to

the Lake of Balaton for a short but memorable stay in a quaint cottage on the lake shore with friends of his. The strongest impressions retained relate to the home-cooked food, the fresh-caught fish that was served differently at each meal, sailing, swimming just as the moon was rising, having dinner with moonlight sweeping in through the open side of the cottage, and listening to gypsy country music. Ali's debt to me was amply paid. When we returned to Budapest, we found that Ed and Earl had been spending their available funds too fast. Accordingly, they were going to have to shorten their stay in Salzburg.

The Anschluss had taken place between my winter visit to Seefeld and the summer visit to Salzburg. Nazi flags were hanging everywhere, which gave the impression that some great athletic contest, with political overtones, was being celebrated instead of the traditional, cultural music festival of Salzburg, Austria. The town was full of soldiers, marching youths, and German tourists in guided flocks. There were some changes in the program that had originally been scheduled, for example, the substitution of the play "Amphitryon" by von Kleist for "Jedermann." However, it was still possible to be absorbed completely in the music. The range went from organ recitals and a very agreeable "Ic Deum" of Joseph Messner through orchestral music of Franck, Brahms, Debussy, E. Porrino, and Nicola Porpora to "Don Giovanni" (the fabulous pair, Ezio Pinza and Elizabeth Rethberg, were the soloists) and "Tannhäuser" (the soloists were not as accomplished as those heard in the U.S.). The final performance during my time in Salzburg was Goethe's "Egmont," with the great actor Ewald Balser as the lead. I could follow the play because I had waded through the German during the afternoon preceding the performance. Staging may have been the most impressive feature of the Salzburg Festival as I experienced it.

I was now on my own. I traveled by train through Rothenberg ob der Tauber, Nürnberg and Frankfurt to Mainz, by Rhine steamer from Mainz to Koblenz, and by train again to Utrecht. My destination was Katwijk aan See, which I reached by train, trolley, and on foot. Aunt Grace had taken a small apartment there with the four girls, and I had a rented room across a narrow street in this small Dutch village on the North Sea. The crowd of children with whom the girls played on the beach (all under fourteen) adopted me as an extra kid and as a kind of scoutmaster to dream up new and crazy things for them to do together. I was also a volunteer lifeguard for swimming and a tour leader for hikes up and down the beach. The week passed quickly while I waited for Nell and her family to return from a trip through Norway. Their house in 's Graveland was to be the site of my second week in Holland. The departure from Katwijk

was touching. All of the children with whom I had made friends, some twenty of them, came to see me off and marched alongside the trolley as it was leaving Katwijk aan See.

In Naarden-Bussum, the railroad stop for 's Graveland, I was met by Nell and her sister Els, whom I was seeing for the first time. Nell was "as lovely as I thought when I saw her at Easter time and have been imagining ever since" (letter of August 30, 1938), which was reassuring. Els had studied extensively and was a great conversationalist on any subject. Their father's sense of humor was delightful, as I had observed earlier. Their mother evinced a somewhat harsh impression, but, for me, she appeared very sweet and generous in her inner feelings. I never had any reason to alter that opinion while she lived. My twenty-second birthday was celebrated in great style on September 1<sup>st</sup>, but not as impressively as that of the Queen, with fireworks on August 31<sup>st</sup>! My letters declared that I had enjoyed the finest week of the vacation and of the year. A skiing holiday was suggested for the next time Nell and I could be together.

When the new term started in the fall of 1938, I moved into new quarters in Lincoln College, a very cozy suite above the Wesley Room. The latter was made famous by the earlier occupancy of the founder of the Methodist denomination. I gained an instant library of wonderful old books that were really on loan, in safe keeping for my Lincoln colleague Heinz Arndt, who was off to spend a year at the London School of Economics. Heinz's father was well known to me for his chemical reputation. He had been a Professor in Germany, but had left the country shortly after Hitler came to power to become a Professor of Chemistry in Istanbul and certainly Turkey's most distinguished academic at that time. I enjoyed being surrounded by Heinz's books. They stimulated me in my own purchases. From that period onward, I was never without a growing library of my own unrelated to my science. Other influences appeared in the form of university lectures. Simon Flexner spoke on the changing character of research institutes. Reinhold Niebuhr spoke on what Christianity could find acceptable in capitalist and in socialist economic theory and practice. The Bishop of London spoke on moral guidance for young people. In the realm of chemistry, Professors Debye (Germany the Netherlands, Cornell University, U.S.) and Pauling (California Institute of Technology) astonished us with their brilliance. Discussions with fellow students in the laboratory, in the hall at dinner, and in my room late at night provided a wonderfully scholastic atmosphere. On the political side, I became the Honorary Secretary of the Lincoln College Labour Club, which provided a venue for topical political discussion. One had to be careful not to spell this as the "Labor Club" in posting notices of meetings because then it

would be nicknamed the “American Club.” Incidentally, my fellow Rhodes Scholar Howard K. Smith was running the parent University of Oxford Labour Club. The to-be-famous correspondent and writer speaks about this political activity in his autobiography. The related British Labour Party was the only effective anti-Hitler organization operating in England at that time. The Liberal Party was only as effective as its small representation allowed.

October of 1938 brought two Rhodes Scholars into residence who had been examined with me in the district selections of 1936. Chadbourne Gilpatric, a philosopher from Harvard who had not been selected for the 1937 class, tried again and “came up” in 1938. James Gardner, a lawyer in the making, was selected in my year but was diagnosed with tuberculosis and had to delay matriculation until 1938 when his lungs were clear. I enjoyed seeing Gil and Jim again, and I was able to share their company from time to time during my final year. In describing music at Oxford (above), I have already mentioned Leigh Gerdine, the musician, who arrived in Lincoln College with the 1938 class of scholars. Chemistry was my chief occupation. I concentrated on research and skipped most of the lectures. Music and sports filled the rest of my time. October again was the most beautiful month of the year and the best period for bicycle rides on the weekends. The pattern of moving into “digs” at the end of each term in 1938-1939 was unaltered. I was invited to the Harrises for Christmas. David Harris’ father was the director of one of the Staffordshire potteries and kindly gave me a tour of his very modern works that made diversified products. David, Jean, their younger brother and sister, and I sang Christmas carols tolerably well together, and the “boys” brought in a yule log that had been cut and aged in the woods nearby. The Harris Family “dressed” for dinner each night. That is, the men wore tuxedos and the women, long skirts. It was a new experience for me. One of their horses tolerated my riding, which is saying something for the horse. As a family, we trekked across the snow-dusted fields to the village church to attend the service on Christmas Day. Mrs. Harris was most generous and hospitable. We kept in touch long after she had lost all the men in her family. She was always interested in my progress with “my Dutch girl.”

After Christmas, David, Jean and I took the train to London to join with others, including Angela Priestley, the daughter of J.B., for a skiing holiday in Switzerland. I was to leave them in Basel and join them again on the way home. The train from Holland connected with ours in Basel; accordingly, I could transfer my luggage to the compartment occupied by Nell and Els. I could also introduce David to Nell, if only briefly. Nell and I were both tired from our long, separate journeys. It took some time to

become reacquainted and to remember that we had come these many, many miles in order to be together. I think it was the last time that there appeared to be a glass wall between us when we would meet again after months apart.

Our ski destination was Parpan in the Graubünden, which was reached by train to Chur and connecting bus. The girls, including a friend of Els from Basel, Margaret Holliger, and I stayed in rooms in a small pension and took our meals in the adjacent small hotel. At the start of the skiing vacation, I found that tolerance and patience could be added to the list of Nell's sterling qualities. I was eager to show her how well I could ski after last year's experience in Seefeld by demonstrating on a small hill with bumps. At the first bump, one ski went up in the air and descended on the opposite side. I managed to stay upright with legs crossed until I crashed at the bottom of the hill, breaking one ski but no leg. When Nell was assured that I was uninjured, she simply helped me gather the pieces together and escorted me to the ski shop, where she assisted in the rental of new skis. Imagine my chagrin and embarrassment, together with my thankfulness for her calm behavior. Snow fell heavily for three days; then, there was sunshine. The tree branches were heavily laden with snow. My boyish temptation was to shake the branches when Nell walked underneath. She vetoed such action with a simple statement, "I trust you completely." The phrase became our watchword. What could, in fact, be a better guide to a loving relationship during all our lives?

We took ski lessons, toured cross-country, climbed (on skins) with a guide, and descended—with occasional interruptions—through the crusted, deep snow into Lenzerheide, where we had tea and took the bus back to Parpan. We also went skijoring behind a sleigh. The Parpan ski teacher who guided me on special excursions and private ski tours was R. Capadrutt. He had been the Olympic single bobsled champion (luge) at Lake Placid in the 1932 Olympics at only eighteen. We got to know each other quite well and became good friends. He was very kind in taking me on some excellent and fairly difficult tours. Imagining my shock and sadness when I read, only one month later, that on the first day of the St. Moritz games, racing for the grand prix, he had crashed off the bobsled run and had hit a tree. It seemed impossible that he was gone. He was such a fine fellow, always smiling and enjoying life with great enthusiasm. That was probably the last occasion in competition when anyone used a hand-and-rope-steered luge, which had been his specialty.

We had some days in January when rest was necessary to mend bruises and twisted knees and ankles. On these days, covered with blankets, we basked in the sun and talked about "life." We also frequented the

ubiquitous cafès and tearooms in Parpan and talked about “life.” We were exploring, getting to know each other better and better. Nell asked deep questions, such as, “Do you believe in eternity?” and “Do you think that different generations can really understand and appreciate each other?” There were dances at our little hotel and, on New Year’s Eve, at one of the larger hotels in Parpan. We tried to learn the swirling, fast waltz of the Swiss—Nell with one of the ski teachers—and we invented our own version of the tango, amusing everyone including ourselves. My habits, speech, or appearance seemed to have changed because I was not taken once to be an American, but instead an Englishman, a Hollander, or even a Swiss. I did not want that holiday to end. However, the girls stayed on in Parpan, and I joined David Harris’ party in Chur for the return journey to England. David and I were able to stretch out because the others had sleepers, which left us with the rail compartment to ourselves. We tramped the streets of Paris after breakfast and endured a very rough crossing of the channel in the afternoon. I was not sick but had to remain prone and silent throughout the crossing. David’s uncle met us and drove us to Chalfont St. Giles, where we spent the night, refreshed by dinner and a bath. It was back to Oxford the next afternoon. Movies of the Parpan holiday turned out very well. When I heard from Nell in February, she sent me a tin of homemade applesauce, “really delicious.” She had remembered my stated wish that I would find a woman who could make good applesauce. Happy nonsense!

The world situation was deteriorating rapidly during 1939 while Nell and I were discovering personal happiness. With retreat and slaughter, Barcelona fell to the fascists, completing the conquest of Spain’s duly-elected government by Franco with the help of the Italians and Germans, who were testing new military weaponry. Fears and premonitions following Múnich (1938) were being substantiated. Czechoslovakia was allowed to fall to Hitler without military conquest. Grace and Bob Vermey and the four girls left for the United States, partly because of the worsening situation in Europe and partly because of Bob’s poor business prospects. I am certain that Nell’s father and mother paid for their trip across the Atlantic and for their resettling in the United States. It was a very wise move and well timed. I anticipated that France would be Hitler’s next point of attack but it was to be Poland’s turn instead from the Polish Corridor “agreement” to the start of World War II in September. In Oxford, meanwhile, the Jooss Ballet performed “The Green Table,” a macabre ballet of war and temporary peace that was most effective. I found that well-performed ballet with a social theme is capable of drawing one right into it and eliciting the same intensity of emotion experienced in watching a good play.

## MORE THAN A MEMOIR

I thought I should learn something about the industrial north of England, which I did painlessly in March by joining a tour, sponsored by the Oxford Society, of Newcastle-on-Tyne and Tyneside. On the way north, the train passed through Nottingham and Sheffield. The London-Northeastern Railway also afforded glimpses of the York Minster Cathedral and Durham Cathedral and Castle. I stayed with two Lincoln College friends, Michael Sharp and Mark Green, in one of the hostels attached to Kings College, Durham University. At dinner, I was the guest of the Archdeacon of Northumberland as we listened to several speeches devoted to the problems of the Tyneside region that embraced about 800,000 inhabitants. On the first day, we saw, from the launch of the Tyne Improvement Commission plying the first twelve miles from the mouth of the River Tyne: the Vickers factory; many ships old and new, including the *Mauretania*, which was being broken up and scrapped; the battleship *George V*, Britain's newest and recently launched; and the Walker and Neptune shipping yards, with ships in various stages of production. On the second day, we inspected the Ashington Colliery, or coal mine, both above ground and underground at the 500-foot level, where we rode the donkey trains and watched the coal veins being dynamited and the coal being collected and loaded. We also visited the Stohswood Colliery, where an aluminous fireclay was found in veins along with the coal and a fireclay works had been developed. There followed a discussion with Trade Union Leaders in Newcastle on attempted improvement in the conditions of the workers. The final day was busy, too. It included a before-breakfast inspection of a fish trawler, distribution and sale of the fish; inspection of slum clearance schemes; and finally, the viewing of a new trading estate where light industries were being started. I have no idea what happened to all of this when Hitler started the blitzing of England's cities. At the time, it all looked encouraging in an area that had been badly depressed. I was lucky to have seen a cross-section of life and work that was not usually visible to university students and especially not to foreign students. I returned to Oxford with a greater appreciation of the working class and of the friendliness of the people in Northern England. It was all part of the "awakening" that was occurring during the Oxford years and that I was trying to relate to my parents in my regular letters. The letters might prepare them to receive a different person when I was to return home. I recommended that my parents read "Betrayal in Central Europe" by G.E.R. Gadye and "The Mortal Storm" by Phyllis Bottome in order to understand somewhat better what was going on in Europe.

David Harris and I had been planning a bicycle tour of Ireland during the latter part of the vacation. However, he decided he had to study, and

Nell, whom I had invited to visit me in England, convinced her father to come along as a chaperone, which made it possible. In those years, it was considered improper in good European families for a young lady to visit a young man, both unmarried, and especially in another country, without family being present on one side or the other. The dates selected for the visit were April 5-13, 1939, and they were to be mighty full, according to my planned schedule. Hein was kind and diplomatic enough to leave us alone from time to time; also, when he was with us, he paid the bills for meals, lodging, and admission tickets. The arrangement couldn't have been better, and Nell and I had a marvelous time, cementing a relationship that we hoped would last forever. She had never been to London. A general idea of its layout and the major points of interest were best obtained by riding on the tops of buses that traversed the city. There was the requisite visit to the British Museum to see the Elgin marbles, the Rosetta stone, the Magna Carta, and Greek and Roman statuary that interested Nell because of her study of muscles and anatomy. We observed Parliament in its last session before Easter adjournment, courtesy of Sir Francis Freemantle. I had to show Nell the Tower of London, St. Paul's Cathedral, Westminster Abbey, Madame Tussaud's Wax Works, Covent Garden Flower Market at 6 a.m. (Hein said, "I don't believe I can make it!"), Kew Gardens, St. James Park, Hyde Park, and Hampstead Heath. On the occasion of Nell's next visit to London in 1960, with all the children, she admitted to me that she had been nearly exhausted by the pace 21 years earlier, but she didn't know how to reign in the enthusiastic guide. We had dinners, for example, in the Cheshire Cheese, the restaurant made famous by Boswell in his "Life of Samuel Johnson;" Adendino's, a continental restaurant off Piccadilly Circus; and a Spanish restaurant. We went to a musical in the Drury Lane Theater; J.B. Priestley's "When We Are Married," a farcical comedy that takes place in a Yorkshire village; Handel's "Messiah" performed in Albert Hall by the Royal Choir and the London Philharmonic Orchestra; and, finally, an ice hockey match and figure skating at Earls Court. I wrote to my mother, "We are having a fine time and we get along very well together. Nell is really perfect."

We were lucky to have sunny weather for the Oxford part of the Verneys' visit. I enjoyed showing them the colleges and the most beautiful gardens. Edward Manning and Leigh Gerdine joined us for a dinner, which was followed by a short recital that I arranged for the visitors. Keith Murray loaned us his room and grand piano for the "concert," which included some lieder sung by Manning, Chopin and contemporary Spanish music by Gerdine, and three songs by myself. "The evening was thoroughly successful," I wrote to my mother. There was more sightseeing on the

next day, luncheon served in my Lincoln College room, and high tea at Mrs. Brucker's. Hein was a bit uncertain about why he had to meet my "landlady," but Nell realized that I was trying to acquaint her with a cross-section of my Oxford life that included my friend and provider during vacations. Supper was unneeded, and we went directly to an Oxford Repertory Theater production. On the final morning, Nell and I cycled along the Thames and through Wytham Village. In the afternoon, we joined her father, who had had business in London. I saw them off on the boat train for their crossing to Rotterdam. Nell and I were in love but concluded that we would probably not be able to marry until she could come to the United States and I had a reasonable job. We considered that it might take several years under the "unsettled" international conditions. How about eight years, which became the reality? Nell had anticipated from young girlhood that she would spend most of her life outside the Netherlands, which no doubt helped her conclude that it could be with me in the U.S.A.

The final Oxford term started well enough. Sidgwick and Sutton returned from trips abroad. They were satisfied with my work but puzzled by some of the results, which suggested additional experiments, luckily definitive. Early crew practice presaged promising results in the end-of-term bumping races. We were veterans, accustomed to synchrony and hard pulling, which made late afternoons on the Thames delightful. The other Rhodes Scholars were returning from adventuresome holidays with tales of coming conflict. As a group, we concluded that Britain would be at war within a year. As individuals, we shared ideas about what each one of us would do under the circumstances. For the immediate present, there were weekend parties that carried over into the summer vacation: at the Carringtons, who were David's aunt and uncle; at the Parsons, which included the races at Henley; and at the home of the J.B. Priestleys, whom I met at the Carringtons' party. Their house on Hampstead Heath was the scene of an elaborate bash that included great food, theatrical games, and dancing to an orchestra. There were starlets of stage and screen imported to match the number of extra males. I felt lucky to be a part of the exotic scene. I was an overnight guest of the Priestleys, and my roommate was a young cartoonist whose drawings appeared regularly in *Punch*. I saw my first small television set in that house. When the Priestleys heard that I was going on a trip to the U.S.S.R. later in the summer, they asked me to stop in after I returned and to report on my impressions. Priestley had royalties due in the U.S.S.R. relating to translation of his books and presentation of his plays. The royalties could be collected only if he would come to Russia. Parenthetically, he was unable to do this until well after the war.

After a stay at Mrs. Brucker's and intensive work in the Dyson Perrins Laboratory, I joined a student tour of the U.S.S.R. sponsored by the Labour Club. The trip, which included passage on a Russian freighter (limited passenger accommodations—four bunk beds to a cabin) between London and Leningrad, lasted from July 22 to August 15. I had signed up for the trip because I doubted that I would ever have another opportunity to see that country and because it was inexpensive. The voyage through the North Sea and the Baltic and then through the canal into Leningrad (now, once again, St. Petersburg) was notable because of all the traffic in those waters. We had time to become acquainted with our fellow passengers and tour guide and to become accustomed to the Russian fare that we were served and would be served throughout the trip. We toured the city's historic and architectural sites, visited the famous Hermitage and the University of Leningrad, and talked, through a translator, to groups of students, trade unionists, and local government officials. Travel by train overnight to Moscow was interesting in that no distinction was made as to sexes in the assignment of bunks, six of them to a compartment. My chief remembrance is that the conversation went on much too long. Fully or partially clothed, we were awakened in the morning by the car porter with a glass of tea.

Moscow is an impressive city, with the Red Square as its centerpiece, broad avenues that challenge pedestrian crossing, and the river that gives it a universal appeal. Once oriented, we found we could roam the city on foot and by the subway that was Moscow's pride. We were less conspicuous as visitors if we wore our shirts outside the pants, like a short-belted tunic. The Agricultural Fair, with its vast exhibits of equipment and produce, represented the very best relevant to the cooperative and state farms. There was no way for the innocent traveler to discern what was ideal and what was real. An event in the Dynamo Stadium left no doubt as to what was really the national sport—football (soccer)! We went to a play (was it Chekhov?), but even though we had read an outline, we were lost in the performance that was well appreciated by the rest of the audience. We visited a camp of young Comsomols who sang for us, and we sang for them. A segment of the Red Army Chorus sang for us in concert. I was strongly affected by the deep, deep notes that their bases were (and are) able to reach and by their high tenors singing in an unrestrained manner. The overtones that one hears from an unaccompanied chorus in perfect harmony provide an emotional musical experience. Small army groups paraded about the city. Traffic police were clearly in evidence and were strictly obeyed. While we attended a garden reception at the British Embassy, we happened to see a flight of large airplanes, probably bombers,

overhead. I counted seven groups of three. Others in the party were skeptical of my count, but I do not know why. How would one have a preconceived notion of the number of military aircraft to be seen over Moscow in the end of July, 1939?

Our Intourist hosts brought some university authorities to talk to us about higher education in the Soviet Union. They even produced students who represented the disciplines of our own group; for example, I was able to talk with a chemical engineering student about curricula and work goals. We were advised strongly to do our shopping in the official tourist stores that accepted only foreign currency. The only bargains there were books that had been translated from Russian into English. The alternative (illegal) was to sell used clothing to someone who approached you on the street and offered rubles in exchange. Everyone in the Moscow hotel in which we stayed seemed to be selling clothing. Possession of rubles meant that you could shop in the large department store (Gummi) for records and for real souvenirs to take home. After a farewell dinner, we returned by rail to Leningrad for the boat trip to London. The most memorable part of the trip was passage through the Kiel Canal. German stukas were practicing their dive bombing technique. I had never seen such frightening activity before. It foreshadowed the war to come. The second most memorable part was the rough weather. Our 5000-ton vessel had great trouble with the waves from time to time. We were trying to put on a skit in the main salon. It was a "musical" based upon our experiences, part serious and part parody. When the going was too rough, we—the cast—would claim an intermission and would lie down on the stage for five minutes or until we regained equilibrium. "The show must go on" was our motto; however, with frequent intermissions it went on and on! Upon reaching London, I stayed overnight with the Priestleys and reported to them on my trip, as requested, while they were enjoying breakfast in bed. It was a story of pluses and minuses and of doubtful portent for the future (the Kiel Canal factor).

I spent the remaining two weeks of August in the Netherlands, part in 's Graveland and part in Leiden. I had signed up for a short course in glassblowing at the University of Leiden. It was a technique that was a necessity for a physical chemist or for any chemist interested in vacuum systems. Nell's mother suggested that Nell should stay in Leiden with me so that, if she was indeed serious about me, she could sample housekeeping for me while I went to "work" each day. Nell and I were delighted to have Annie's approbation. Nell stayed in the small suite that Els occupied when she was attending Leiden. I slept in the room that Jaap Versteegh, her fiancé, occupied during the University year. We spent most of our

time in Els' suite, where Nell cooked for me and we tried to plan the future. I went off to the laboratory each day. We took trams each evening, to sample different resorts on the North Sea coast where we could listen to music or walk along the shore. Our stay in Leiden was idyllic. I was semi-serious about the glassblowing. My best work was done at the end of each day when I fashioned designs in glassware for Nell, mainly of flasks or little vases. If they were less than perfect, my instructor added the finishing touches.

Back in 's Graveland, there were bicycle rides, visits to Nell's two favorite aunts, walks along the canals and through the beechwoods, some tennis, and long talks and embraces in the garden. As war came closer when the expedient Nazi-Soviet agreement was made public, the earlier notion that we might be apart from each other for a period of unknown length of time became a reality. We promised that we would wait for each other and that we indeed would marry. The Germans and Russians invaded Poland on September 1, 1939. It was only a matter of time before England and France would have to honor their commitment to Poland. I left Holland on September 2<sup>nd</sup> to sad goodbyes. Hein drove me to Utrecht, where I took a bus to Rotterdam and there boarded a ship to London. We were steaming up the Thames estuary at the very time the tolling of bells and the hooting of whistles were announcing the declaration of war, that is, at 11:20 a.m. on Sunday, September 3, 1939. The vision, the dream of again coming up the driveway of Westerveld, the Vermeys' house in 's Graveland, had to sustain me for many anxious years.

After two years of residence in college, students at Oxford, or at least Lincoln, could move into digs in town. In anticipation of a third year, Leslie Epstein had found suitable lodgings for us if we could add a third tenant. We found an English student of astronomy who was willing to join us. He was a very quiet member of the household even though he liked to play his clavichord (very quiet for a keyboard instrument) early each morning, "to chase away the cobwebs," as he said. The house at 7 Canterbury Road, Oxford, was the home of a Professor of Physiology. His family occupied the first floor, which allowed the second floor (two bedrooms, sitting room, study, and bath) and the basement (kitchen with table and chairs) together to serve as an apartment. Breakfasts were provided by the owners. We prepared all other meals that we took at home, and these turned out to be very tasty. We were even successful at entertaining. For me, however, the residence that was supposed to be for one year served only two weeks.

Our position was this. All of the U.S. Rhodes Scholars reported to Dr. Allen, the Warden of Rhodes House, each morning to receive information

as to the possibility of continuing our study, of doing useful work while waiting, and of obtaining safe passage to America. "Safe" meant passage on a ship of neutral or U.S. registry. It was impossible to continue my own work toward the D.Phil. degree. The government took over the laboratory. If I were to find some "useful work" to do, it would stretch out my time in unsafe England without any professional advancement. Moreover, I had little faith in the Chamberlain government's engaging in a war successfully. (The same was my opinion of the French government at that time.) I opted for returning to Oxford at some future date for a deferred third year and traveling home immediately when passage could be obtained. I spent the waiting time in straightening out my affairs: paying bills and gathering together my belongings. We had to be packed, or nearly packed, because we were placed on a 24-hour alert to respond to any possibility for passage home, which was to be paid for by the Rhodes Trust, plus a generous allowance. I wrote on September 8, 1939, "It will be the saddest day of my life when I leave England, with my work unfinished and Nell in Holland, still in the danger zone." It will be recalled that Holland was a neutral country, a status that Hitler did not recognize on May 10, 1940, when the country was invaded.

I started making goodbye visits, e.g., to Leslie and Catherine Sutton at tea. Catherine would go to Canada and Leslie would become involved in war research. I took Keith Murray to dinner. He was going to work on the Agricultural Production Board and would in due course be in charge of food provision for the British troops in North Africa. Professor Sidgwick took me to dinner in the Brasemore College Senior Common Room with dons from Brasenose, Lincoln, and Exeter. I considered him a great man who stood out even above other great men. He continued writing his impressive treatise on *Inorganic Chemistry*. During World War I, he had designed the altimeter that was used in military aircraft. I believe it was my observation of his work habits that influenced me to invest long hours in chemistry when I rose to an academic position. I had dinner with the Peters family. The connection was the Oxford Society that had sponsored, for example, the tour of Tyneside. The daughter, Cynthia, and I had been partners at Rhodes House dances. She was an art student but shifted to nursing when the war began. Rodney Parsons went into his final officer's training and saw service in France and in the Near East. Tony Parsons went into the Navy, where he served eventually in some headquarters capacity. Jean Harris came to visit me in Oxford and brought very, very kind letters from the other members of the Harris family. They had been wonderful to me, without any sentimentality. Tony Hugill reported for Army service and eventually ended up in Intelligence. I would see him

again in 1945 in Germany. The other chemists of Dyson-Perrins Laboratory dispersed or shifted from degree programs to essential war work. Lincoln College was converted to a nurses' training center but was otherwise left unchanged. My name was still over the door of my room when I saw the college again at the beginning of October, 1945.

Upon notification of day-after-tomorrow departure, sixteen of us Rhodes Scholars were transported to Southampton for sailing on the *American Farmer*, a small ship of the United States Line. Our luggage was limited to one trunk and hand luggage. I managed to add a gramophone and records, which entertained us when my colleagues were in the mood. We were actually very close colleagues because all sixteen of us slept on carefully arranged cots in the main salon. It was lucky that the crossing was smooth because, in a high sea, the salon would have been transformed into a jumble of cots. It was also fortunate that none of the scholars slept noisily, so that rest was possible even under the crowded conditions. When we were not solving the world's problems and our own in busy conversation during the journey, we were lounging outside the radio transmission office, gleaning information about the progress of the war.

The reality that there was a war in progress was brought home to us rather dramatically only about 100 miles off Britain. Suddenly, our ship altered course. It was announced that we were answering an SOS call and were on our way to pick up survivors of a British freighter that had been sunk by a German submarine. The freighter, which was en route with a cargo of sugar from the West Indies to England, had departed prior to the declaration of war and had thus been caught. Two lifeboats with crew were floating when we arrived; one boat with about six crew members had been swamped when the freighter went down. The U-boat had remained on the scene to ascertain the nationality of the ship that would answer the rescue call. While we were in the process of swinging the lifeboats aboard the *American Farmer*, a British navy bomber appeared and passed low over the submerging submarine, all within eyesight. The plane passed over several times, dropping depth charges, and then flew overhead, wagging its wings. Bubbles and an oil slick appeared, but as one learned later in the war, this release might have been a subterfuge. The drama was not yet over. A British radio announcement later on that day indicated that a navy plane had returned from a successful mission of the sinking of a U-boat only to have its parent aircraft carrier sunk by submarine action: an incommensurate loss.

As each day went by and we came closer to the United States, the general mood improved. We realized that we were truly on our way home after two years abroad, that we would be seeing families again, and that

## MORE THAN A MEMOIR

we were beginning a new phase in our lives. We prepared ourselves to face new challenges. At the dock to meet me upon arrival were my mother and Aunt Kate and Uncle George and our friends the Sultzers. My father, probably in his excitement, had dropped a glass in the bathroom and had cut his foot. He had to sit with his foot elevated for several days until the cut had fully healed. I sold one of my still photos of the freighter crew to the *N.Y. Daily News*; however, my 8 mm movie film of the freighter, U-boat and bomber episode, which the *News* developed for me, lacked sufficient definition to be used in any commercial newsreel. It is still worthy of home showing. With exciting commentary, it can still evoke "ohs" and "ahs." In October, 1939, I began a new chapter of my student life. "Now, after six years of college life, you're going to work," said my father. "No, Dad, I have to continue in graduate school to obtain a Ph.D. degree," said I, "but I can be self-supporting."

## COLUMBIA YEARS—1939-1942

Columbia the Gem  
April 19, 1994

I am not going to sing the rest of this line, but I am going to provide you with some history and personal observations, quite selective, but relevant to the song's foreshortened first line that serves as the title of my talk about the Chemistry Department of Columbia University.

Over a time period that I can measure in decades, at least five of them, Columbia has had excellent students, undergraduate and graduate. The excellence of the present crop is being celebrated at this Seventh Annual Columbia Chemistry Awards Dinner, and they are to be congratulated. They represent the brilliance, toughness, and lasting quality of the "gem" in my title. Another facet of the gem is made up of the postdoctorates who have come here to "finishing school." They were few in my time but now constitute a formidable body of adopted Columbia alumni and a wonderful source for professorship appointments across the country. Caltech, the University of California at Berkeley, and the University of Illinois, as examples, have benefitted from this source.

Finally, there is the facet of the gem called the faculty. Despite about 30% attrition each decade, by my crude estimation, a maximum level of excellence has been maintained. Columbia University Chemistry has relinquished luminaries to M.I.T., Harvard, Chicago, Illinois, Wisconsin, Caltech, etc., but has grown and developed new ones. The faculty steady state also includes a healthy balance among the subdisciplines. There are not many U.S. universities in which uniform high quality in chemistry has been maintained over five decades. In conversations with old Columbians, I have found general agreement with my thesis of constant quality.

A good part of my chemical education was obtained in a Chandler Laboratory. The Columbia one was named—as you know—after Charles Frederick Chandler, Columbia Professor of Chemistry from 1864 to 1910. He received his doctorate from the University of Göttingen in 1856, when he was 20, and returned to the United States to be an *unpaid* assistant to Charles A. Joy of Union College. To remedy the lack of salary, Chandler

served as janitor at \$400 per year while teaching chemistry, geology, and mineralogy. He advanced from Janitor-Instructor to Professor at Union College at the age of 21 when Professor Joy moved to Columbia University the next year. In 1864 Chandler followed Joy to Columbia to teach all branches of chemistry and mineralogy. In short order, he became Dean, lectured at the College of Physicians and Surgeons in the afternoon and at the New York College of Pharmacy in the evening, and became Head of the Chemistry Department. He was also New York's first public health chemist. He was joined at Columbia by his brother, William Henry Chandler, five years his junior, who served as an Instructor during 1868-1871. William was then called to Lehigh University and was the Professor of Chemistry there until his retirement in 1906.

The Chandler Laboratory at Lehigh was where I received my undergraduate chemical education. For its unique innovation in laboratory design and ventilation, that building had received a design prize at the 1889 Paris International Exposition and has just this year been designated as a National Historic Chemical Landmark. William, who was as energetic as brother Charles, also became Director of the new library at Lehigh University, was Editor-in-Chief of "Chandler's Encyclopedia," and served twice as acting President of Lehigh University. The combined teaching activities of the Chandler brothers covered 80 years of influence, touching directly possibly 40,000 students.

Between my two training periods in Chandler Laboratories, I studied at the University of Oxford, but my D.Phil. Research was cut short by the start of war in 1939. The decision to continue graduate study at Columbia University was an easy one because of the Columbia faculty, as outstanding at that time as it is at present. The shock of having to work as a teaching assistant to earn my keep was eased by a \$500 grant from the Carnegie Foundation, available to each of us who had to return precipitously to the United States.

Harold C. Urey, Nobel Laureate, was Head of the Department of Chemistry. Some of the Professors from my time who come to mind are Joseph Mayer (his wife, Marie Goeppert Mayer, later won a Nobel Prize), George Kimball, Charles Beckman, Victor K. LaMer, Louis Hammett, Robert E. Elderfield, Arthur C. Cope, J. M. ("Pop") Nelson, Charles Dawson, H.C. Sherman, Mary Caldwell, and Ray H. Crist. Marston Taylor Bogert was retired but present, and Theodore Rosebury taught a fine course in microbiology at P. and S.

Now, some anecdotes about these staff members, quite aside from their chemistry: Harold Urey taught an excellent course in thermodynamics, which I actually enjoyed because of him and because I think it is necessary

to sit through thermodynamics twice! When asked a question during lecture, Urey would assume a pugnacious stance and remain silent until he had worked out the answer completely in his head. Unlike most of us, he was not uncomfortable with silence. The class began at eleven o'clock. Urey was oblivious of time constraints, and often we would have to mention plaintively to him at 12:30 p.m. that some of us had to each lunch in order to attend another lecture at one o'clock. Joseph Mayer was equally brilliant but more approachable. I waited to take a required physical chemistry laboratory course until he was substitute teaching because I wanted to avoid the regular instructor. Mayer used to sit on one of the laboratory benches, swinging his legs and chain-smoking cigarettes, ready to answer any student questions. We moved from station to station in the laboratory, performing experiments in spectroscopy, kinetics, determination of physical properties, etc. Lengthy reports were favored, and analysis of errors was *de rigueur*. One afternoon about half-way through the semester, Mayer called me over and asked, "What are you doing here?" Astonished, I replied, "Taking the course, doing the experiments, submitting reports." "Yes, I know, but I am now satisfied that you can do all this. You can leave now." "Thank you, but I must try for an A grade in order to qualify for a fellowship next year." "Well?" I left.

George Kimball was an expert in quantum mechanics, a kineticist, and an electrochemist. His younger brother Penn, a journalist and author, whom I had known at Oxford and whom I still see occasionally, retired recently as professor in the Columbia School of Journalism. Victor K. LaMer was reported to be hard on organic chemists, so some of us tended to avoid his course in physical chemistry. We also preferred to absorb the contents of Louis Hammett's book on physical organic chemistry rather than attend his lectures. His wife once told me at a party that he was born "one martini too few" in his communication level. On a one-to-one basis, he was a great source of wisdom and research advice. Bob Elderfield, with whom I did my work, gave a comprehensive course in organic synthesis that stressed, for the first time, intermediates and reaction pathways, also relative costs. He was noted for his research on steroids and alkaloids, and he later edited a series of volumes on "Heterocyclic Chemistry." He was a terrific experimentalist. Once, when I was having trouble purifying reaction intermediates, he zipped through a four-step sequence on a one-mole scale during two evening sessions. Center cuts of each of the liquids had perfect analyses and the initial and terminal refractive indices of each lot were uniform. I learned by watching and assisting. I was most grateful. Occasionally, evenings in Chandler Laboratory would be different, in that Professor Elderfield would drop by to give us research suggestions that

seemed rather bizarre. We soon learned how to tell that he had had a number of martinis at the West End ("Wet End") Restaurant before dinner. On such evenings, we had a reinforcement pact among the graduate students not to follow these research suggestions. They were, fortunately, forgotten by the following morning.

Art Cope was brought onto the Columbia faculty during my time, and he extended his rearrangement studies, discovered at Bryn Mawr College. He brought along an assistant, Dr. Evelyn Hancock, who established new and higher levels of research organization, laboratory apparatus, and laboratory technique. Cope also instituted the idea of literature seminars that covered ground other than course material and thesis research. I was amazed that a voluntary, informal, non-credit seminar program would succeed, but that it did! Charles Dawson also taught organic chemistry and was a curriculum adviser. He and J. M. ("Pop") Nelson were interested in enzyme chemistry. "Pop" Nelson taught a course in protein chemistry that also dealt with the constituents of "nucleic acids": pyrimidines and purines. I am convinced that the method of representation of purines in those days postponed advances in the chemistry of these important molecules. The purine ring system was pictured as a rectangle to which was attached something that looked like a house lying on its side. The false picture, which bore no resemblance to any other ring systems, was a much greater deterrent to understanding hydrogen-bonding patterns than mere incorrect tautomeric forms that were the complaint of James Watson in 1953 in ascertaining the structure of DNA. Marston Taylor Bogert, who had worked on some of these heterocyclic ring systems, was retired but still maintained an office and an international presence in chemistry. He had been President of the International Union of Pure and Applied Chemistry and counted among his many honors the Order of the White Lion of Czechoslovakia. We decided that we could measure a person's dignity in "bogerts," but that if the Professor was one bogert, every one else would have to be titrated in "microbogerts." He had a very good degree of tolerance for younger chemists, and he had a remarkable memory for the organic chemical literature up to about 1920. Ray H. Crist spent about 20 years on the Columbia chemistry faculty. He wrote a laboratory text for general chemistry and gave undergraduate lectures that were based on impressive demonstrations. He also taught a graduate course in photochemistry (George Wald was a student, Harold Urey was an auditor). He inspired more than one advanced undergraduate. Sidney Benson, Professor at U.S.C. and author of "Thermochemical Kinetics" (first edition, 1976), cites Crist's photochemical course as being his career's inspiration. I enjoy bringing Dr. Crist to your attention because, at 94, he is healthy

and teaching at Messiah College, Grantham, Pennsylvania, where he guides the research of undergraduates on metal interactions with biomaterial and publishes the results of his own experiments (four papers since 1988).

What were the graduate students like during 1939-1942? When I started Ph.D. research at Columbia upon my return from England, my lab partners were Elkan Blout and Josef Fried, also working with Bob Elderfield, and they seemed very good. In fact, I concluded that, if they were average graduate students of chemistry in an average American university, I might not be able to make it in chemistry, and I should develop some alternate career. Elkan Blout, fresh from Princeton, was very savvy and also close to the Physics Department. He later developed the instant color process at Polaroid, became Professor at Biological Chemistry at Harvard, and then the Dean of Faculties at Harvard's School of Public Health. He served 12 years as the Treasurer of the National Academy of Sciences, and he is currently Treasurer of the American Academy of Arts and Sciences because he did such a visionary job for the N.A.S. Blout was offered a Professorship at Columbia along the way (1960). He still regards that offer as the best affirmation of his value to chemical science. Josef Fried was born in Poland, studied in Leipzig, and escaped the Nazis to Switzerland, where he studied with Paul Karrer at the University of Zürich before he came to the United States and Columbia University. He was one of the first to purify and crystallize carbohydrates by chromatography when he worked on streptomycin at Squibb. He was the originator of the fluorocorticoids. From Squibb, he was called to the University of Chicago as a Professor of Biochemistry, then to Chemistry, and then Chairman of the Department. He is now Emeritus but still works in the laboratory. A Josef Fried Symposium is held at Chicago each year in his honor. His many patents have made millions of dollars for the pharmaceutical industry. Obviously, Blout and Fried were not average graduate students.

Bob Elderfield claimed he could not pronounce "Josef" properly, so he was given the nickname "Gus." But Gus could not understand Elderfield, so when the boss was giving Gus research directions in a jargon that combined tough, vernacular, slang, and metaphor, either Elkan or I would sit outside Elderfield's office on the bench in front of the dumbwaiter, taking notes and later translating for Gus. Gus's wife Erna was a fine cook, and for our efforts we were rewarded from time to time with a home-cooked meal. Gus and Elkan and I became the best of friends in a relationship that has lasted thus far almost 55 years. One of the most wonderful things about graduate school is the friendships that are made when students, imbued with energy and fresh ideas, are struggling under

similar circumstances toward common goals of learning experience and of understanding scientists as well as science.

Paul Doty, a contemporary of ours as a graduate student, has completed a distinguished career at Harvard. Norman Davidson, who overlapped with us partially while serving as a postdoctorate on the Manhattan Project, distinguished himself at Chicago and then at Caltech, where he still serves as Executive Officer of the Division of Biology. William Knowles went to work for Monsanto, where he developed asymmetric catalytic hydrogenation on a commercial scale. Stacey ("Spike") Cole, who, even as a graduate student, earned a level of 500 microbogerts, became a university president and then the President of Research Corporation. Isaac Asimov was writing science fiction and would often come into our laboratory asking for new adjectives and adverbs. He was paid by the word by "Astounding Stories" and such magazines, so he never left a noun or a verb unmodified. His pay advanced from one cent to three cents a word during the time I knew him at Columbia. It was monetarily unfortunate that I never accepted one of those vintage magazines that he offered me. (My sons have always complained about my reading habits.) I compared my remembrance of those times with the corresponding section of Asimov's autobiography. He talked about dating a (beautiful) blonde, but absent from his pages was the following exchange. Isaac, arriving somewhat breathlessly: "Nels, I kissed a girl last night—first time!" "Good! How old are you, Isaac?" "Twenty-one. Why?" "Nothing. Just asking."

Isaac and a fair number of our classmates were "subway graduate students" who had no place to relax or study between classes, so one of the first actions of the graduate student society that we organized was to provide a student lounge. It served the commuters and doubled as an informal seminar room. Stacey Cole was the first president and I was vice-president, to my recollection. We collected \$500 from faculty members to furnish the converted classroom, which was provided by the Department. We also held seminars there on weighty topics such as "Science and Society," which is still under consideration.

A departed graduate student likes to return to his graduate school to check on his friends who are still there. I returned to Columbia for about three years for this purpose and also to check on a spot on the ceiling of the graduate synthetic organic chemistry laboratory. A student, intentionally unnamed, who was working at the bench behind me, complained that his Grignard reaction mixture was smaller in volume than mine and nothing was happening, even though he had added a bit of iodine and had applied local heating. I could see that he had forgotten to use ether as a solvent, but I also noticed that a reaction was starting anyway.

I suggested that we walk over toward the window, where we would be able to see better in order to reread the directions. When I had gotten him outside the range of his reaction flask, we turned around to see a spectacular ejection from the condenser that caught fire as the column sped toward the ceiling and burned a large circle there. There were other graduate students with interesting experiences or habits. One could recognize whether a certain lady from a wealthy European family was in the laboratory when a full-length mink coat could be seen draped over a coat hook in the hallway. I was afraid we took advantage of some of the urban dwellers by taking them on a snipe hunt on a moonless night. We left the “baggers” in a park up in Westchester County while we “beaters” returned to an all-night cafe nearby until we felt it was time to rescue them.

There were not many postdoctoral research associates at Columbia in those days. W. Lincoln Hawkins joined the Elderfield Group in such a capacity in 1940 after study at Rensselaer, Howard, and McGill and lectureships at both Howard and McGill Universities. He was a great addition to the group and we all learned from each other. I felt that Elderfield was not doing very much toward getting Lincoln a job by 1942. I occasionally visited my father and mother on a Sunday. They lived in Mount Vernon, N.Y. If I were lucky, I could get a ride back to N.Y.C. and Columbia on the following Monday morning, when Morton Sultz, an old family friend, would drive to Bell Laboratories, then on West Street, where he was Personnel Director. We talked of many things, but I usually talked about how great Lincoln Hawkins was. Finally, one morning Mr. Sultz said to me, “If you go on talking about your black friend every Monday, either I am going to have to give up driving you back to Columbia or I will have to invite him for lunch.” “The latter! You’ll hire him.” Together, we broke the color line at Bell Labs! Lincoln had a distinguished career at Bell Labs in research (international patents, research papers, and editing) and administration (Supervisor, then department Head of Applied Research, then Assistant Director of the Chemical Research Laboratory). When he ran for President of the American Chemical Society in 1985, he cited the following objectives:

- Improving the public image of Chemistry;
- Increasing opportunity for continuing education of chemists;
- Expanding channels of communication between the general membership and the Society’s governing bodies;
- Advocating greater support for basic research to maintain national leadership in innovation.

These objectives would be highly desirable for any aspirant who seeks

this office. Lincoln shared with me the letter he received from Morton Sultzter, written August 15, 1985, from Penswood Village, Newton, PA:

Dear Doctor Hawkins,

Your letter of May 10 brought pleasant memories. I do remember that lunch we had in the Blue Room at 463. I shall never forget the impression you made and how important it was at that time.

Thanks for the copy of Bell Labs News. While I never met you after that luncheon, I followed with great interest your many contributions at the Labs.

At 96 years of age I don't get around much, but my years at Bell Labs mean much to me and our luncheon in the Blue Room holds many memories.

May your new ventures be as fruitfull (sic) as the past.

There was no Fair Employment Practice Act to protect against discrimination in those years. A representative of DuPont came to Columbia to interview in 1942, and Elderfield asked me to place my name on a list to see him. I declined because I wanted to teach and because Elkan Blout and Gus Fried were not asked to sign up. I was adamant until Elderfield pleaded with me on the basis that he received research funds from DuPont, and I would be doing him a personal favor. I told him I would interview on that basis but would not take an interview trip if it were offered. It would probably be unfair for me now to describe my interview with Dr. Tanberg, but I was offered a visit to Central Research of DuPont and turned it down, apparently the first time this had happened.

I thought that was the end of it, but about two weeks later a heavyscet man lumbered into our laboratory out-of-breath and complaining about the unevenness of the floor numbering of Havemeyer and Chandler Laboratories. After he caught his breath, he said, "I'm Speed Marvel. Which of you is Nelson Leonard?" After Elkan diplomatically left the room, Marvel said, "I hear you are a stubborn bastard who wants to teach. It is helpful if you take a postdoctoral year first, almost customary now. How about coming out to the University of Illinois to work with me on synthetic rubber research?" I thanked him and told him I appreciated the offer and his reputation, but that unfortunately I was not interested in synthetic polymer chemistry. I wanted natural product chemistry. He replied, "You *are* a stubborn bastard! All right. Suppose I hire you as a postdoctorate for Roger Adams. Would you like that?" I started in that

role in the fall of 1942, and teaching was added to my duties in the spring of 1943. That was one crazy way to obtain one of the few teaching jobs available.

What were the undergraduates like in those days? Columbia has always had good undergraduates. I shall only mention two on whom I had slight influence as a teaching assistant in the course of qualitative organic analysis. One was Bruno Zimm, who claimed I drove him into physical chemistry because I told him the limits of the concepts behind the “qualitative” experience of organic chemistry. He is a member of the National Academy of Sciences, recently retired from the University of California, San Diego. The other was the late David Ginsburg, to whom I would frequently say, “David, David, you are so smart. Why are you so lazy?” My chiding words may have had little influence; it was really his Israeli wife to whom he gave the credit for his activation. His career was celebrated by a festive session of the 51<sup>st</sup> Annual Meeting of the Israel Chemical Society, dedicated to him on the occasion of his 65<sup>th</sup> birthday. I wrote a congratulatory message on that occasion in a letter dated October 7, 1985:

**I have known, followed, and admired David Ginsburg from his brilliant but relaxed student days at Columbia University through his elegant researches, valuable structural systematization, amusing editorial work, excellent pedagogy, constructive contributions to the Technion, and international scientific citizenship, a chemist loved by all.**

*N. J. Leonard*  
*Professor of Chemistry and Biochemistry*

I mentioned earlier two of the outstanding postdoctorates in my time at Columbia. There have been many others, sometimes present in groups. The enduring quality can be illustrated convincingly by one group consisting of a postdoctorate and two students who shared a Columbia laboratory about 1968: Robert Bergman, now at U.C. Berkeley; John Groves, Princeton; Robert Grubbs, Caltech. I have been fortunate in being able to send several of my Ph.D.'s to Columbia for the postdoctoral experience, in particular with Professors Nakanishi and Breslow.

I have already illustrated, somewhat by anecdote, the nature of the Columbia faculty in my day. My experience with the present faculty has been mainly with the organic chemists. I hope I will not be considered too parochial if my comments do not range further than this impressive group.

Columbia chemistry has had the ability to detect brilliance early and to

act quickly in the hiring of its faculty. I recall a major lecture at a National Organic Chemistry Symposium by Eugene van Tamelen on the synthesis of lupin alkaloids. We expected a conventional slide at the end of the talk in which he would list his collaborators. There was only one name on the last slide: Thomas J. Katz, an undergraduate research student. I once served on a visiting committee to Vanderbilt University to evaluate its Chemistry Department. The major cause for my enthusiasm about Vanderbilt's future was the presence of a young assistant professor, W. Clark Still, who was very soon plucked away by Columbia. I have been on many donor committees that selected on the basis of quality—Sloan Foundation, Guggenheim Foundation, NSF, and NIH—and Columbia faculty have always fared well. This is a particularly good year for Koji Nakanishi, who is receiving two major awards. I was particularly honored to find my picture in his autobiography, but it was a 1964 residual of my second profession (singing). Gilbert Stork and Nicholas Turro are synonyms, in world language, for synthesis and photoreactivity, respectively, and we are catching Ronald Breslow between plenary lectures and on the road for President-Elect of the American Chemical Society.

I shall close tonight with further application of my metaphor to tell you that I appreciate being here to catch the radiance of this moment in the lifetime of Columbia the Gem.

## ILLINOIS YEARS—1942-1945

My arrival in Urbana-Champaign, Illinois, did not herald an auspicious beginning to my career at the University of Illinois. I came from Detroit, where I had been visiting my aunt and uncle, on the Michigan Central Railroad to Chicago and from there on the Illinois Central Railroad to Champaign. I learned later that the Wabash Railroad would have afforded more direct hypotenuse travel between the two cities. A taxi brought me from the railroad station to the “nearest hotel” (my request), which was just one block away. Imagine a New Yorker being caught in a scam like that! If I had been more observant, I could have seen the hotel sign from the exit of the Champaign railroad station. The Inman Hotel was of poor quality and was not equipped to deal with the September heat wave of 1942. It was a long walk from there to Noyes Laboratory of Chemistry. Roger Adams and the other staff members were away, attending an American Chemical Society meeting. My trunk, which had not arrived with me, needed a week of tracing work to coax it to Illinois. This litany of woes, however, was readily displaced by the pleasures of the second week. I found a place to live, described in the chapter on “Where Did We Live”; my trunk arrived; Roger Adams returned and we agreed jointly on a research plan that intrigued me; some research students included me in a picnic; and I discovered that excellent, reasonable meals were available in the cafeteria of the Illinois Union Building.

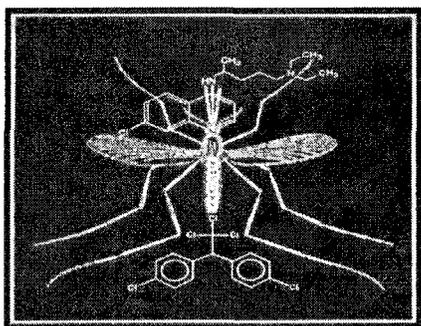
The junior staff and students in Chemistry were bright, dedicated, and friendly. John E. Mahan, who was another postdoctorate with Roger Adams, was especially helpful. Once I had done the necessary library work as background for my research problem, I began the experimental work with gusto, gradually increasing the hours at the bench until they ran from 8:30 a.m. to 10 p.m. regularly, five or six days a week. On Sundays, I wrote letters, took long walks, and listened to whatever music was available. To this routine were added bicycle rides, tennis, squash, and regular attendance at seminars and university concerts. I began to feel at home in the flat and waterless land. I found out how to get things done in the laboratory, and I introduced some of my new colleagues to fractional distillation and chromatography methodology that I had learned at

Columbia University. The biochemists were already well versed in the latter separation and purification methods, but these had not yet become routine for the organic chemists at the University of Illinois. My laboratory became a visiting place for those postdoctorates and students who liked to discuss chemistry and laboratory technique, but only when Professor Roger Adams was out of town. Dr. Adams had relinquished the headship of the Department of Chemistry to Professor William C. Rose because of commitment to war work. When Adams was in town, which was not very often, he used a desk and two chairs in the inner part of "my" laboratory. At such times, I entertained no visitors, and I also had to skip out of the laboratory when he was calling Washington on confidential matters or when he was deep in discussion with other professors. We developed a compatible routine for the pursuit of our very different activities.

In February, 1943, teaching duty was added to the postdoctoral research of John Mahan and myself because of the absence of so many of the permanent teaching staff and because of their assignment to war-related duties. I found new pleasure in the teaching of organic chemistry to non-majors, and I added "why" and "how" to the rather factual presentation in their required text. I learned to lecture without notes, aided by a single outline card. I also found out how to pace lectures and how to make up exams. None of this comes naturally. It all has to be assimilated by experience. Eventually, I determined how to give an understandable lecture by imagining myself sitting down among the students and listening to my own words. If you carry this out-of-body experience too far, you may end up as a simultaneous critic as you speak, asking, e.g., "What is he saying now?" Being two people in one body can be confusing. I also came to understand that you cannot thrill an entire class but that you can reach a few responding students in each class. In that first course of mine, I reached one student in particular who was far smarter than anyone else. He was considering becoming a missionary, but I convinced him that he could become more efficient in saving people as a chemist. He switched to being a chemistry major, went to graduate school, and eventually had an outstanding academic career, concentrating his research on biologically active natural products. We cannot run the experiment to find out how many souls he would have saved had he become a missionary. Nevertheless, he never regretted his choice.

In August of 1943, I happened to be enjoying a Sunday dinner in the Men's Faculty Club where I was joined by Roger Adams, who was not allowing himself vacation time at their "camp" in Vermont. When the conversation got around to the question of how the research was going, I could tell him that I had established the structure of retronecine by

synthesis. This had been our primary one-year goal, so he became somewhat excited, asking "What are you doing this afternoon?" I had no definite plans, but I was thinking of taking a hike. This obviously did not interest him, for he replied "Write up the experimental section of the paper describing your work this afternoon, come to my house after supper, and we will write the discussion section tonight." All of that transpired, aided in the evening by joint consumption of a bowl of popcorn. Adams was well satisfied, but I begged for another month of work in which I would be able to establish the relative stereochemistry of all the products. This he approved. I really learned about drive and focus on that busy Sunday afternoon and evening.



Chloroquine (top), etched in marble wall,  
National Academy of Sciences

There was some question as to what would happen to me after the 1942-1943 academic year, but the question was solved by an appointment as Instructor in Chemistry for 1943-1944. I was also encouraged to direct the research of senior undergraduates majoring in chemistry, which was a highly satisfactory experience because of their knowledge and practical training. I also joined the National Defense Research Council-funded Antimalarial Research Program under the direction of Professors Charles C. Price III and

Harold R. Snyder at Illinois. For background information, the Japanese invasion of Indonesia had cut off the world's quinine supply. Accordingly, when U.S. forces started regaining the islands of the Pacific, they had to battle not only the Japanese but the malaria mosquitoes, the latter without the benefit of the natural antimalarial medicine. Until that time the only synthetic substitute for quinine was atabrine, the side effects of which were almost as debilitating as the early manifestations of the disease itself. Highest confidential priority was given to research and development of improved antimalarials, and a large university-industrial team was in operation for this purpose. The most promising substitute candidate among those we made was Chloroquine, which required a new method for the synthesis of 4,7-dichloroquinoline, a necessary intermediate. Graduate student Royston Roberts with Charlie Price invented a suitable synthesis. I led a group of graduate students in development of the method, and, by means of some 72-hour stints in the laboratory, we prepared the intermediate on a grand scale. Our pilot-plant effort was sufficient for Chloroquine to be produced

in time for its use in the Pacific Theater against the assaults of the *Anopheles* mosquitoes. Alas, with the widespread later use of Chloroquine in Southeast Asia and Africa, the malaria parasites have now become resistant to this once-very-effective drug, and new methods for preventing and for treating the dread disease still have to be found.

In my participation in the Antimalarial Research Program, I shared in the direction of the excellent graduate students of Charlie Price and Harold Snyder, and I established the practice of consulting with the students each day on the progress of their antimalarial research. We explored other methodology for the synthesis of precursor 4-hydroxyquinolines and of potential antimalarials with other ring substitution and other heterocyclic rings. The research publications (17) that resulted from the Antimalarial Research Program helped me to obtain membership on the Graduate College Faculty and with it the authority to direct my own graduate students. I could also continue to direct undergraduate students who elected to do research with me in their senior year. Because of the essential nature of the antimalarial work with which I had been occupied, I continued to be deferred by my draft board. I entered into further civilian service in the summer of 1943 with the teaching of a V9 unit of the U.S. Navy that was quartered at the University of Illinois. This did not substitute for my regular teaching. It was just added on, with the benefit of an extra \$500 in pay. Then, during the academic year 1943-1944, I had another added assignment of teaching organic chemistry to premeds in a U.S. Army unit on campus. Two stories about this unit are worth telling.

The soldiers had a dog, one of the largest I have ever seen, which they trained to behave differently to men in civilian clothes. For example, I happened to meet my student unit as they marched through the campus, dog alongside. For their amusement, at an appropriate command, he bounded toward me and placed his forelegs on my shoulders. We stood face to face. Since I am somewhat of a dog person, I talked to him in a friendly manner, telling him that since we were going in opposite directions, he was really impeding our progress. He relented after a lick or two. The soldiers appreciated my reaction and the result. On another occasion, I found him standing on my lecture desk when I came in to give my regular lecture. Since his bulk prevented the Army students from seeing my writing on the blackboard, I had to "talk" him into lying down and shifting to one side of the desk. In later lectures that year, his usual place was on the floor. The dog's name was Dammit, which allowed the Army unit to vent its feelings as they marched through the campus with "Here, Dammit!", "Sic him, Dammit", and similar phrases. The other story relates to cheating. After the first exam in my course, two of the best students in the unit came to me with the question as to whether I knew

that wholesale cheating was going on in the class. I had never experienced organized cheating before, and I was almost physically sickened by the knowledge. On retrospection, I realized that I should not take it personally, but instead, that I should make it impossible for cheating to occur on the rest of the exams. As a result, half of the class flunked and returned to the infantry. Their Captain Thornberry, who was in charge of the unit and who became a friend of mine, asked whether I would teach a second course in organic chemistry to the worthy survivors so that they could continue with Army medical training in the fall. I invented a course in medicines and drugs, and all the students passed. I kept in touch with several of the men who became M.D.s and had very satisfying careers after the war.

My friends at the University of Illinois were mainly those whom I met through chemistry and music. There were others whom I met at lunches or dinners in the cafeteria of the Illinois Union Building. Three ladies in the Livesay family were good companions. First, there was Naomi Livesay, who taught in the Department of Mathematics. When she left to marry, she introduced me to her cousin Patty Livesay. And when she left to join her fiancé who was obtaining a Ph.D. degree at the University of Pennsylvania, she introduced me to her younger sister, Elizabeth Ann Livesay. Ann was a student in Geology, a pianist, and she played classical records in one of the lounges of the Union Building at set hours of the day or evening for all listeners. After graduating as the salutatorian of her class, she took a Master's degree in Geology. Then she went West, married, and has lately settled in Oregon where she and her husband write books. Among the faculty, Professor Donald Kemmerer, in the History of Economics, and his wife Mirjane treated me to Thanksgiving and occasional Sunday dinners. Don had been my teaching assistant when I took a course in Economics at Lehigh University. Professors R.C. Fuson and Sherlock Swann, Chemistry and Chemical Engineering respectively, met one night per week, 8-10 p.m., to listen to records from Sherlock's extensive record collection, and to sip beer, or Scotch, or Irish whiskey. They invited me to join them. I appreciated the music and the company, and I learned to appreciate the drink, the first alcoholic beverage of my life (at 26!). My participation on the Chemistry Bowling Team made me acquainted with members of the other teams in the Faculty Bowling League and rounded out the Midwest experience with a regular bowling night. During 1944-1945, I was an Associate in Chemistry, and this was the title to which I returned in 1946 after service in Europe. Imagine! In those days there were two ranks *below* that of Assistant Professor, namely, Instructor and Associate. Eleven of us held those ranks in Chemistry at Illinois during 1942-1946, and I was the only one to remain and advance to Assistant Professor and Associate Professor.

# FIELD INTELLIGENCE AGENCY TECHNICAL

September 15, 1945-February 1, 1946

I was appointed as a Scientific Consultant with the Technical Industrial Intelligence Committee, Chemicals Subcommittee, of the Foreign Economic Administration, and my rank was that of a Field Grade Officer, equivalent to that of a Lieutenant Colonel. I was assigned to the screening, evaluating, and translating of captured German documents. The purpose was to render available to the United States Government such German chemical information as would be useful to the United States and its industry.

I departed from the Sea Terminal of La Guardia Airport, New York City, on September 28, 1945, on a Pan Am flying boat assigned to U. S. Army transport service. It was my first flight. We landed first in the harbor of Halifax, Nova Scotia, and then in the harbor of Goose Bay, Labrador. Small berths were made up for the over-ocean leg of the journey after we were served dinner in the salon of the aircraft, and we flew in low over the west of Ireland to land near Limerick in the Shannon River early in the morning of September 29.

We stayed that night in Ireland and flew on September 30 by land plane, probably a DC-3, to London's Croydon Airport, and I was billeted near St. James in the heart of London. The briefing as to the purpose of our mission did not occupy much time, so I wandered about London to see what was still standing and what had been destroyed and to visit old favored haunts. The only place to eat was in the officers' mess or in the Red Cross cafeteria. I also took the train to Oxford to see my old professor, Leslie Sutton (Magdalen) and to dine in hall with Keith Murray, then the Rector, and a Don of Lincoln College. I was recognized by the servants of College who were there when I was in residence before the war, 1937-1939, and my name was still in place over the door of my lodgings above the Wesley Room. Nurses had been quartered in Lincoln from 1939 until 1945.



NJL visiting Oxford, October, 1945

Seeing Oxford again was a gratifying experience. It was prevented from becoming completely sentimental because I was accompanied by Professor Donald Keyes (University of Illinois), who was also attached to T.I.I.C. I had the pleasure of guiding him around the Oxford that I knew so well. He was also a guest with me at the High Table in Lincoln, where he kept the dons amused by his easy-going garrulous nature and his stories as a wartime chemical engineer (in the U.S.). I thought, during the consumption of much wine, that he was embarrassing us, but I was assured by Keith Murray that he had been a true American “hit”. At the table that night had been a classics scholar, the discoverer of penicillin, a world authority on Byzantine music, and others, along with Keith Murray (later Sir Keith Murray and then Lord Murray of

Newhaven), who was an agricultural economist. Don Keyes and I caught a late train “up” to London.

We had several days in London (and Oxford), and I also went down to Kent to visit the parents of Rodney, Tony, and Rosemary Parsons, with whom I had spent many weekends before the war. We were finally flown to Frankfurt, Germany, and were distributed in billets (houses requisitioned by the U.S. Army) in Hoechst. There we fell into the routine of army transport, army mess (actually, excellent food) and bare offices where we worked on documents. After some weeks, we established a document library in Griesheim that included an efficient microfilming facility. Earlier, F.I.A.T. (Field Intelligence Agency Technical) or T.I.I.C. personnel had interviewed the administrators and research directors of the major industries, but it was my contention that the material of real transfer value lay in the research reports and process directions. These we gathered in from all sources, starting with the separate plants belonging to the I.G. Farbenindustrie, evaluated them, indexed them, and had them microfilmed for transfer to the United States.

It might be wise to review the Allied objectives with respect to a war industry, such as I.G. Farben, which had employed slave labor, produced war gases and the lethal gas used in concentration camps, and had state-approved monopoly status. All this had occurred earlier. The general

objectives of seizure of I.G. Farben were (1) to destroy its monopolistic control over German industry and (2) to eliminate its war potential. The specific objectives were (1) to make the plants available for reparations, (2) to destroy certain plants utilized strictly for war purposes, (3) to decentralize management, (4) to disperse ownership of individual units, (5) to terminate all interests in cartels, and (6) to prevent research for war purposes. There was little for the United States to gain except through the transfer of information. In the field of chemistry, this amounted to research, development, and production in the areas of acetylene chemistry, synthetic rubber, pharmaceuticals, coal conversion processes, etc. It was in these and other areas that the document center could provide detailed information for transfer to the U.S. and use, sometimes immediately and sometimes later, by American industry.

I found I could manage a diverse team consisting of scientists and translators, secretaries, document procurers and handlers, microfilmmers, and a librarian who took on the additional task of completing the individual collections. The team, which consisted of 28 personnel during the initiating phases while I was in Germany, worked very efficiently as long as the scientists and translators did not stray from their labors.

We did take a few trips, mainly over weekends and mainly to coordinate our work with that of the intelligence units of the U.S. Navy. I also travelled to the Netherlands to talk with the Professors of Chemistry and Chemical Engineering about what had happened to them, their students, and their laboratories and what was now necessary for rebuilding and resuscitating academic and industrial chemistry. I formed a firm friendship with Piet Heertjes, who was a Professor of Chemical Engineering at the University of Delft and whom I would see again at various times in our careers. The trip to Holland, which was made in an open jeep with an army driver, also enabled me to see my fiancée again, Louise Cornelia Vermey, for the first time (November 1, 1945) since we had to part (September 2, 1939) at the beginning of the war. Our emotions would be difficult to describe. It was not until I had talked with Nell at length, along with her father, sister Hilda, and aunt, that I could really appreciate what it had been like to be in occupied Holland from 1940 to 1945 and especially during the starvation winter of 1944-1945. Her family had hidden underground soldiers and had taken in displaced persons from the eastern part of the Netherlands. Her sister's fiancé and his brother had been tortured and shot. Nell had adopted a Jewish child whose parents had been sent to concentration camp. She was a courier in the underground and was honored by the Queen for her work. She travelled long distances by bicycle, in the night and on "tires" that were thin strips of wood, in order to obtain food

from Friesland for the family. In short, she had made a strong commitment to her country and intended to remain in Holland.

Because I had trouble convincing Nell that I had been doing something worthwhile during those terrible years and that this “stranger” freshly arrived again from the United States was really the person to whom she had been engaged, I felt I had to return again to Holland to improve my status. The U.S. Army was not interested in learning more about Dutch chemistry, so I had to make a personal trip, i.e., hitch a ride, or several rides as it turned out. This was done with the aid of Antony Hugill and “Tiger” Child in British Navy Intelligence. Tony and I had been laboratory partners in Oxford during 1937 to 1939 and were surprised to meet each other walking down one of the streets of Hoechst. I had brought music along to Germany and he was a pianist (along with being a chemist, an actor, and a linguist), so we played and sang together, when no one else was about, in the British Naval Officers Club. In any case, he arranged my first ride, to Lübecke and Minden, and introduced me to Tiger Child, who was in charge of all intelligence concerning Germany submariners. I drove with him to the Hague and back to northern Germany. He was only interested in taking me along when he found that I was pursuing an affair of the heart rather than some U.S. Army intelligence mission. He wrote the necessary military orders that would allow me to cross the borders. The story of his career in British intelligence is fantastic. It has appeared in the form of a biography. An important bit of advice that he gave me was to hire a German librarian if I wanted to have my (research) files 100% complete. I convinced the commanding officer in Hoechst to do just that on the basis of Commander Child’s experience, and it had a remarkable effect on the operation of our document center. Missing years of research reports appeared as if by magic. I never asked about their sources when they appeared suddenly, usually following a weekend.

Back to a few hours spent in the Hague on November 30 or December 1, 1945: We agreed that Nell would come to America. What a joy and what a relief! I felt that she should come as a visitor in order to sample the life and to learn whether I was really the person she thought I was, now that she had seen me (twice) again after those six intervening years. From the time of that December meeting, we could completely trust each other to work toward the desired end, despite difficulties of separation, communication, post-war limitation on travel and entry into the United States, family problems and commitments, etc., etc. I was not even able to start my side of the process until I returned from the intelligence duty at the beginning of February, 1946.

The remaining months in Hoechst/Griesheim were very productive at the document center, and the system for the retrieval of information worked smoothly. It was possible to appreciate musical events presented under the auspices of the U.S. Army. Bruno Vondonhoff conducted orchestral music that had been banned under the Nazis. Also, in Frankfurt, we could hear Edit Picht-Axenfeld play the late piano sonatas of Beethoven; Helmut Walcha, a master of the harpsichord; Rose Stein, a harpist; Clare Smit, a violinist; and others. There were Sunday afternoon performances of Bach cantatas in a village church below the Kronberg. A group of us sang a concert of Christmas carols. I even took voice lessons from Frau Ilse Lampmann, who was a radio singer and a fine interpreter of Schubert lieder. I have already mentioned doing music with Lt. Comm. Antony Hugill, and then Captain Leigh Gerdine of the U.S. Air Force appeared in Wiesbaden as an aid to the Commanding Air Force General. Leigh and I had been Rhodes Scholars in Lincoln College, Oxford, during 1938-1939. He was (is) an accomplished pianist and had been my accompanist in several concerts in Oxford. It had been a joy to hear him play, especially Chopin and Ravel, and I had learned a lot about music from him in our year together. Visits between Wiesbaden and Hoechst re-established our friendship and our musical kinship. Later in our lives we were to perform the Brahms "Requiem" and the Bach "St. Matthew Passion" together when he was at Miami University, Oxford, Ohio, he as conductor and I as bass soloist, and we gave a recital of piano and voice when he moved to Washington University, St. Louis, as Head of the Music Department.

I made many friends among the British, Canadian and U.S. military personnel who were stationed in Germany and shared a common mess hall in Hoechst. I kept in touch with a number of these people whom postwar duties had brought together, and I still remember some of them with Christmas greetings. It was hard to say goodbye because my colleagues gave me such a delightful sendoff party. Then, it really became difficult to say goodbye because of weather either at the Frankfurt airport or in London. For two days, the U.S. military transport did not fly. I tried to be unobtrusive, almost invisible, back in Hoechst, and I was in danger of losing my billet and my mess card. Each day a telegram arrived requesting my presence back at the University of Illinois for the start of the spring semester. I was getting desperate. I observed that on each of those days spent at the Frankfurt-am-Main airport, the R.A.F. military transport *did* fly to London. In conversation with their dispatcher, I learned that they counted on the fog being dispersed over London for about half an hour shortly after midday, allowing the plane to descend through the cloud cover and land at Croydon. The U.S. military transport had tighter

flight regulations. I resolved to use my travel orders and any residual English accent to fly with the British. All went well for my becoming their last passenger until they weighed me and my luggage. Too heavy. I removed a bottle of cognac from my tote-all and placed it on the dispatcher's desk. Nothing happened. I removed a bottle of Scotch and did the same. "There, now. I believe you are within the weight limit," said the dispatcher. I clambered aboard, and off we flew to Croydon, landing through a hole in the clouds. I was assigned to a billet in Harley Street, London.

I was kept busy reporting, obtaining cash, shopping at the PX and a few shops that were beginning to stock merchandise, buying some sheet (vocal) music, obtaining some back issues of the *Journal of the Chemical Society* that were missing from the University of Illinois Library—probably due to the sinking of vessels carrying the mail from Britain to the U.S. during the war, and arranging for transport home. I found time to visit with Tony Parsons, Rosemary Parsons, and Kitty Strang with her two housemates and her new son, David. The Parsons and Strangs have maintained a close friendship with the Leonard family over almost 60 years.

Departure for the homeward journey started by train from London to Bournemouth on Tuesday night, January 29, 1946. We were transported to the airport at Hearne for boarding the Pan Am four-engine land plane, a DC-4. After one early morning stop (I remained asleep), we crossed the Atlantic to Gander, Newfoundland, arriving in mid-afternoon of Wednesday, January 30. A very brief walk along the landing strip to stretch the limbs also produced frostbite of the ears. The flight further westward was interrupted at Moncton, New Brunswick, because of weather, and we remained there overnight. On Thursday, January 31, we flew to New York, and I was able to stay overnight in my parents' home in Mount Vernon, New York, for a happy reunion. In Washington, D.C., on Friday, February 1, I was debriefed by the successor organization, J.I.O.A., under the Department of Commerce. I reported on the importance of the microfilmed material and described the program that had been initiated for the further gathering and distribution of chemical information. The rail journey on the New York Central Railroad from New York to Indianapolis connected with what was called the "Big Four" to Urbana, Illinois. There I was plucked off the three-car train on the following Monday by Professors Marvel, Snyder and Frank, to be taken to participate in a Ph.D. preliminary examination. Thus, was I apprised abruptly of the real world of academe to which I was returning.

## ILLINOIS YEARS—1946-1947

Upon my return from Europe in February, 1946, I found that life in Illinois had not changed very much. However, I had changed because I had seen the devastation caused by the war in Europe. I had come to realize the dimension of human loss and to understand the trauma experienced by those who had survived. Central to my own being, by contrast, was the new-found optimism that resulted from seeing Nell again after six years apart. The optimism was put to work in stages to achieve her coming to the United States. At first, there was no direct postal service between the U.S. and the Netherlands. However, service was maintained to Sweden and Switzerland, and we could communicate through friends in those countries. Nell's parents were undergoing a separation. Therefore, she was not comfortable remaining in 's Graveland, and she moved about, staying with friends where she could be of use in family rehabilitation. Finally, postal service to the Netherlands was restored, which made possible the sending of letters and CARE packages of limited weight, one per month. I became a shopper and packer: shoes, nylon stockings, blouses, skirt and dress material, sweaters, even undergarments. In some cases, I was an embarrassed shopper, but I did receive an education in women's clothing. My mother sent CARE packages of food. Most of the packages arrived at their intended destination and were greatly appreciated because the Dutch had little clothing left and only minimal food available in 1946. Soap was a precious article.

The months went by. It was necessary to fill in forms to arrange for a visitor visa for Nell, and I had to find a married couple—friends—who would sponsor her visit. As a single man, I could not do so myself. Sponsorship meant placing \$2,000 in an escrow account for Nell so that she would not become "a ward of the state" and would have sufficient funds to return, after her visit, to her country of origin. When the U.S. side of process had been put in order, Dutch papers had to be obtained re: birth, schooling, family, police record, etc., etc. Imagine trying to assemble all the notarized data when everything had been disrupted and all personal records were in a jumble in Holland. I began to doubt that we would succeed in our plan, and in one of my letters to Nell I must have sounded

forlorn. Encouragement came in the form of a visiting lecturer to the University of Illinois. It was Piet Heertjes, a Professor of Chemical Engineering at the University of Delft and a mutual friend. He had been hired as a visiting professor at Purdue University, came to Illinois for a lecture, and brought me a message from Nell, delivered in person: "Nell wants me to reassure you that she is really going to come to America. The formalities just take time." She said it was "Honest to Piet!" The next thing to do was to arrange passage. That could be on the S.S. Stockholm, but Nell would have to get herself to Sweden from Holland. No money was available in Holland; however, I could buy all the necessary tickets in dollars and send her additional dollars for incidental expenses.

That summarizes what was going on in my personal life from February, 1946 to February, 1947. Music has been covered in that chapter. What about chemistry? I had a heavy teaching load. Classes were full because the G.I. Bill was providing college education for returning veterans depending upon their years of military service. I resumed my role as Investigator on the Antimalarial Program under the Committee on Medical Research of the OSRD, which was winding down its activities but was still investing in the synthesis of successor antimalarials to Chloroquine. Because of my status as a member of the Graduate College Faculty, I was able to accept graduate students who were suddenly available in large numbers. After thirteen had started to work with me, Professor Adams indicated that the number seemed excessive. I believe I answered rather naively that I had several more exciting research ideas to offer to graduate students. He then pointed out the difficulties of starting such a large number at one time, of directing their work from day to day, of substituting new research ideas for those problems that would falter, of supporting so many, and of finishing off their Ph.D. degrees, including reading and correcting their theses and conducting their final exams. Additionally, Adams suggested that a more rational number of graduate students to accept in one year could be obtained by dividing the number of organic chemists entering graduate school by the number of faculty members who could direct their research. All of that advice made good sense, and I have given it to junior colleagues whenever it seemed appropriate.

The new graduate students were closer to my age, and they were serious about their work since their student lives had been interrupted by the war. We accomplished some worthy research together. We also enjoyed our spare time together. Within a softball league, we had a mixed team of students and faculty members on which I played first base. My defensive play was better than my batting. Baseball was a leavening element in our chemistry lives. Three of my senior research students progressed far

enough in their single year of work that publications could be written and further research could be planned based upon what they had accomplished. I was and would remain an Assistant Professor of Chemistry through this period and when Nell would arrive in 1947. There was no thinking about the process of achieving tenure in those years. There was as yet no formal process in place. That came later. I had no interest in a teaching position elsewhere because I was enjoying my work, together with the colleagues and friends that I had at Illinois. An invitation to lecture at Eli Lilly and Company in Indianapolis brought me a contract as a Consultant, which status continued until I retired. Travel between Urbana and Indianapolis was initially convenient on the Big Four branch of the New York Central Railroad and, after 1949, by car. At Lilly, I was able to follow along and occasionally assist in their great chemistry, I developed lasting friendships and I appreciated the additional stipend for enjoyable work.

## Writing

How do scientists tell of their research findings? Usually, by means of the scientific papers they write and publish in refereed journals. There are additional means at present, including the Internet, preprint distribution, and talks at meetings, but the main method, at least when I was starting my teaching/research career, was via published papers. How does one write a scientific paper? It is an evolving process that grows out of writing research reports, theses at the B.S., M.S. and Ph.D. levels, and first drafts of papers under a Ph.D. mentor professor. When I was on my own as a beginning staff member at the University of Illinois, I sought advice from senior staff members to supplement my initial writing efforts. I remember well three bits of advice that I took to heart.

Harold Snyder, upon reading one of my early efforts, questioned a statement I had made: "Johnson opined that . . ." etc., etc. He said he knew Jack Johnson very well and doubted that he ever "opined" anything. Thus ended my attempt to incorporate unusual words in that paper or in other papers that followed. The message received was to state things simply, understandably, and in everyday language. Carl (Speed) Marvel read another of my early papers in manuscript and concluded that I was trying to prove two major points. His message was that I should compose the results in two separate papers because readers seldom remembered more than one conclusion from a single paper.

R.C. Fuson offered to criticize a review paper I had written. When I returned to his office to obtain his recommendations, I was very

disappointed because he offered no substantive revisions at all, yet I knew my first attempt at reviewing all known information about a particular series of compounds could not have been that perfect. I was about to leave when I told him that I was disappointed because I had really come to him for instructive, serious criticism. "Oh, in that case . . .," he said as he opened his desk drawer and withdrew two sheets of handwriting. Fuson indicated that my writing was like a collection of reference cards. Improvements were suggested to omit the dates (years) of publication, as well as the locations and names of the authors, with which I had started each paragraph. Instead, the subject matter was supposed to guide the ending of one paragraph and the beginning of the next, so that the article "flowed." Terminal references would disclose all the details of origin. In the rewrite, the pedantic, unimaginative collation of data was converted to a critical, adhering discussion. Fuson sometimes wrote verse under the name Robert Fox. The surname could be applied in this case of requested and reluctantly supplied advice. I followed that advice in all my later writings in which I was recounting prior scientific history.

By the time I had absorbed these writing lessons, I had the temerity to rewrite a joint paper that my senior colleague Charlie Price had presented to me in first draft and on which I was supposed to be a co-author. Chemists are well advised to follow a book by Louis Fieser that deals with proper phraseology on the basis of both chemistry and grammatical English. The book by Strunk and White, *Elements of Style*, is a requisite for anyone attempting good writing. It is of but incidental interest that E.B. White (*Charlotte's Web*, etc.) went to the same high school that I attended in Mount Vernon, New York.

## ILLINOIS YEARS—1947-1948

### Nell's Arrival

After the semester ended in January, 1947, followed by a week of skiing in Winter Park, Colorado, I returned to Illinois to make preparations for Nell's arrival. It was almost inconceivable that the event we had waited and struggled for was actually going to happen. I was in a highly excited state when I made the train journey to New York and on to Mount Vernon to stay overnight with my parents, awaiting February 11. Morton Sultzer, forever a friend, loaned me his car, which I drove somewhat sanely to the 57<sup>th</sup> Street dock on the Hudson River, where the Stockholm was arriving. Ship departures and arrivals in New York Harbor are always exciting, but this one was exceptional. I was on the dock peering up the gangplank that was emptying passengers onto solid ground, actually timber and asphalt. Actually, only first class passengers! Then, second class passengers. When I spotted Nell at the railing after all the second class passengers had disembarked, she called down that I should come back to the dock in the afternoon. I went to the Russian Tea Room on 57<sup>th</sup> Street for lunch, happy that I had seen her and reveling in my emotions of the moment. However, staring into my delicious borscht did not tell me why there was a delay in her disembarkation. Nell finally descended the gangplank in the afternoon, possibly the last passenger off the ship, and into my waiting—long-waiting—arms. She had been taking care of someone else. This was part of a life pattern that was to be repeated over and over again. One of her stateroom companions, an elderly lady, had been seasick during the entire passage. She had not left the stateroom and thus needed a total clean-up before she could be seen by some relatives who had come to meet her but were not allowed to board the ship. Nell had volunteered for the job.

Nell's seven small pieces of luggage were scattered about the dock, but we found them, gathered them together, and, with the help of a porter, passed them through customs and loaded them in the borrowed car. I drove up the West Side Highway, pointing out as many sites as I could while admiring my passenger. At one stage, when we were changing

parkways, Nell asked, "Why are there so many water towers here? That looks like one I have seen before." I had actually been driving around in big circles instead of switching parkways from the interchange. There was only one water tower! Back on track, I was on the way to the modest apartment on South Second Avenue, Mount Vernon, where my parents lived. They had been alerted to the fact that we would be late, which had only increased their excitement and anticipation. Before I had left Mount Vernon to meet Nell, each had one question. My mother's was: "I know I will love her, but does she smoke?" My answer reassured her: "Yes, one cigarette on her birthday each year, but I think we can break her of that habit." My father's question was: "What shall I do when she arrives?" My mother: "Oh, Len, just do what comes naturally." He did not have a chance to think about it. Nell gave him a big hug and a long kiss on the mouth. He was a goner. Nell and my mother had instant rapport, which they maintained as long as my mother lived. Mother had prepared one of her delicious meals, and there was much, much talk, the opening of some gifts for Nell, and then, much needed rest. On the following day, Nell met my aunts and uncles in their Bronxville house, and we sat down to a marvelous meal prepared by my Aunt Flora. We were on track for repairing Nell's lack of adequate nutrition for the past four years. Nell had captivated the rest of the family, and I had become a hero for acquiring such a fine partner (finally). It was a special moment in time.

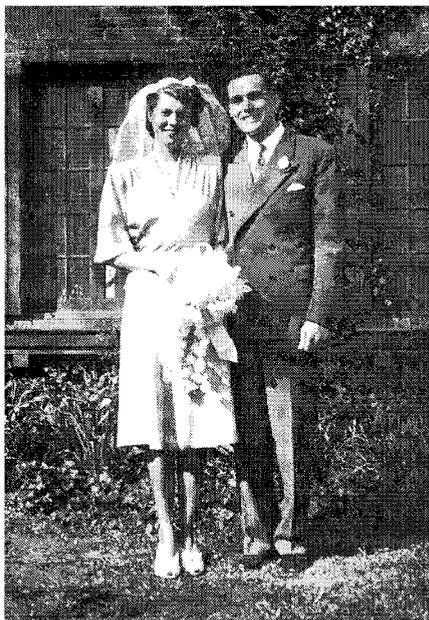
As soon as we had made the family connections, we were on our way back to Illinois by train through Chicago. Nell was really tired from the ocean voyage, during which she had been seasick, from the excitement of the arrival, from the impact of her new country and new "relatives," and still from the long war years that had left her undernourished, yet unable to consume the generous helpings of food that were offered to her. I realized that the transition was to be gradual if it was going to be lasting. She survived the long train ride and responded happily to the new scenes. However, I must say that planar, central Illinois in mid-February did (does) not offer the most hospitable landscape. The story of how we settled ourselves in Urbana is told in the chapter, "Where did we live."

## First Month in Urbana

During the spring semester of 1947, I taught the graduate course in organic synthesis from the carefully organized notes of my senior colleague, Professor R.C. Fuson, and I directed the research of the seniors and graduate students who had joined my growing group. We attended

concerts and watched the University of Illinois baseball team in action. Nell was even content to watch my softball team play after working hours. She became hooked on the sport as a spectator, but later when she participated in mixed games, it turned out that she could really hit the ball. She felt that an appreciation of baseball was essential for becoming an American. Nell eventually adopted the St. Louis Cardinals as her favorite professional team, preferring to follow the play on the radio because it required imagination; moreover, she could knit while she listened. An added consultantship I had with the Monsanto Chemical Company in St. Louis meant that we could make an excursion out of my chemistry visit and could watch a Cardinal game following a good dinner in Busch Stadium.

These were sporting habits that actually developed with time. Back in May 10, 1947, we were married in Bronxville, New York. The occasion has been slipped into the chapter on *Singing Career* because I had performed just two days before in Chicago, and the two events were necessarily merged and rather tightly organized. The fact that we had returned to Urbana for Mrs. Roger Adams' tea party the day after our wedding in New York put us in good grace with Urbana's most demanding hostess. In fact, we helped to enliven the event. We had fortified ourselves after lunch with champagne, and we arrived at the Adams' impressive house on Michigan Avenue in a joyous mood. I was astonished that the line of people leaving the house reversed direction and rejoined the party as the whisper percolated down the line that Dr. Leonard had gotten married. Nell was warmly greeted but was soon lost to me for a time as people crowded around to inspect her: a composed beauty from the Netherlands who had excellent command of English and stylish manners. I experienced a notching-up in their estimation of me. After our triumphant entry into "society," Nell and I returned to our little rented house to finish the champagne and to recapitulate the experience.



Wedding, May 10, 1947

The rest of the spring semester passed smoothly as we visited more friends and toured the nearby countryside and towns in an old car that had been kindly loaned to us by Don Kemmerer. Summer came early to central Illinois that year, as it usually does. By my teaching two courses during the first part of the summer semester, we could take a delayed honeymoon in August, during which month my colleague Bob Frank took over and finished up both courses. During June and July there was no hint of a pregnancy. Nell was impatient because of her experience in Holland as a “war mother,” when she had to give up Daniel Hookstra at three and a half years upon the survival—and return—of his parents from concentration camp. Otherwise, she was settling into her new life in the U.S. with pleasure and continuing anticipation.

## Summer Travel

The first stop on our summer travel was a little cottage on the beach of Lake Michigan, in the southwest corner adjacent to a state park. The town of New Buffalo was accessible on the Michigan Central Railroad out of Chicago. The nearby little cottage, which I had visited before and which I had rented this time for a week, was primitive in that one had to pump water, cooking was usually done on a kerosene stove, and there was no indoor toilet. I was introducing Nell to U.S. rural life along with showing her the beauty of Lake Michigan. However, the smell of the stove made her feel sick, so I used the barbecue and the fireplace to do the cooking. We could walk to a food store and small restaurant. Tomato juice became Nell’s favorite food during that week. We learned over time, but not immediately, that a craving for tomato juice along with an enhanced sensitivity to unpleasant odors was an early indication of pregnancy. The beauty of Lake Michigan and the contentment of lying on the warm beach in between swims helped to make up for discomforts.

The next stop on our trip was Cambridge, Massachusetts, where we were to stay with my dear friend Elkan Blout and his family. It was possible in those days to board a Pullman car in New Buffalo, Michigan, that would be switched to the New York Central at Detroit and switched again at Albany, New York, to cross through the Berkshires in early daylight and on into Boston. Sorting out the rail connections was part of my enjoyment of our travel—on this leg of the journey in a Pullman drawing room. We saw the sights of Boston and Cambridge, where Elkan and Joan lived close to Harvard University. Elkan was directing organic chemical research at the Polaroid Corporation and arranged for me to present a seminar

there, for which I received an honorarium that helped with our travel expenses. Nell was experiencing unusual symptoms—beyond the craving for tomato juice—that encouraged Joan to take her to Women's Hospital in Boston for pregnancy tests, the results of which were to be communicated to us at our next stop.

Credit the power of advertising! A picture of the Inn at Smuggler's Notch that had appeared in *The New Yorker*, together with some knowledge of Vermont, caused me to choose the Inn as an ideal honeymoon (three months late) lodge for the next week. The rail journey from Boston took us northwest through White River Junction, NH, where there was a rather long stop while various train connections were made. Nell excused herself from walking the platform with me, while I inspected appreciatively all of the mechanical switching operations. On the platform, I met Dr. John H. Wolfenden. "Of what interest is that to the reader?" you may well ask. I regarded the meeting as a very pleasant omen, even though I do not necessarily believe in omens. John Wolfenden had been a Don at Oxford when I was there and had been a member of the oral examination committee that approved my B.Sc. thesis. We recognized each other immediately although eight years had passed. Dr. Wolfenden had been the much-admired British liaison officer between the defense research councils of the U.S. and Britain during the war and had been hired on the Chemistry Staff of Dartmouth College after the war, which is why I was seeing him on the railroad platform at White River junction. Twenty years after that platform meeting, his son Richard and I met each other. Richard and I had already published a scientific communication together on the basis of converging interests, and we met at a conference shortly after. He said his father still remembered that chance meeting in White River Junction years earlier. Back in 1947, then, we continued by train to Woodbury, VT, where—according to my recollection—a car from the Inn met us, to drive us through Stowe to our destination. It was an ideal mountain lodge, with comfortable rooms, a central lounge with a fireplace, excellent food, and only a few August patrons.

We settled in happily and took advantage of the proximity of the Inn to the chairlift that serviced the ski area on Mt. Mansfield. Beautiful views in beautiful weather and plenty of huckleberries to munch on! We could descend by chairlift or by a road through the woods. As we grew accustomed to the surroundings, we ventured on other hikes, especially along the stream that cascaded over the rocks on its way down to Stowe. Nell engaged in the pursuit of her Dutch ancestors. She arranged and rearranged the course of the water flow, moving stones around so as to create small pools and mini-waterfalls. I found a deeper pool in which to take a cold

dip. But, then, one day, we hiked too far. We found on the map a path that was reputed to be a portion of the Appalachian Trail. Near Smuggler's Notch, to the north, we found it in reality. That "we" was increased in number to three, because we were joined by a collie to whom I had talked too affectionately as we left the Inn. He was not to be discouraged from joining us, despite my urging him to "go home" in all possible intonations. The problem with the trail, one we had committed ourselves to irrevocably, was that it had not been re-established clearly since the hurricane of 1938 and the passage of the war years, 1940-1945. Unexpected but true.

The dog became so tired and hot going up, over, and under fallen trees that I had to lift him, or at least one end of him, over the logs. Nell and I became equally tired and began to wonder whether we would still be on the trail after daylight. I was beginning to feel apprehensive and, certainly, irresponsible. These feelings pervaded my consciousness as I leaned against a tree that stood at a fork in the trail. Which overgrown path should we take? My hand moved up the trunk of the tree while I contemplated this unalterable decision. My hand came in contact with a long stick that had been nailed, at its top, to the tree. I shifted the stick idly back and forth and noted that when it had been swung to its limit to the right, the tip stopped inside a "lazy V" made of two wood strips nailed to a second tree to the right of the first one. The result was a wooden arrow pointing to the right fork, which we took with some assurance. After a short level stretch, the trail descended rather steeply and steadily until it reached the stream. The dog plunked himself down in its shallow center, faced upstream, and tried to drink the entire flow, submerging himself completely now and then to cool his body. Nell and I took off socks and shoes and stood in the cooling, anesthetizing water. Then, we completed fording the stream and paused to make a decision as to whether we should move upstream or down on the far side. The noise of someone hammering luckily caused us to hack our way through the brush in an upstream direction, which was counterintuitive but nevertheless correct for the way back to our Inn. A house under construction meant a dirt road was handy, and the dirt road led to the highway. When we finally reached the Inn, our adopted dog gave us a few friendly licks and disappeared. A message from Women's Hospital, Boston, confirmed Nell's pregnancy. We contemplated the errors of our ways: we had not informed anyone of where we were going; we had not determined the state of the trail we selected; we had no maps and not enough drinking water; no compass; no good sense in keeping the doggie with us for the long, dry hike; no right to endanger a possibly expectant mother by the exhausting activity. I was chagrined, but the lesson was learned and remembered. We spent our last

two days resting and reading by the fireplace as the weather turned stormy. A rail journey to New York allowed us to stay with my parents, while I attended an American Chemical Society meeting daily in the City, and Nell shopped in Mount Vernon with my mother. Then it was back to Urbana-Champaign.

## The 1947-1948 Academic Year

During the fall semester, I taught a graduate course in stereochemistry, which deals with the spatial arrangement of atoms and molecules. It was of my own invention and coverage, which made it an exciting challenge. The students and auditors were receptive and enthusiastic and contributed willingly to concocting original problems which they solved on their own or in cooperation with fellow classmates. It was interesting to me that one of my senior colleagues asked to see my notes, which I provided promptly. He was not favorably disposed to my subject matter and was not familiar with it. Nevertheless, I felt that it represented a body of research with which the students should be acquainted, especially since there was much new material and broad contemporary interest. In some cases, the teacher is lucky if his impact is publicly acknowledged many years later, e.g.:

“The third semester, taught by Nelson Leonard, dealt with stereochemistry . . . Nelson was one of the more inspiring teachers I have ever had, and both Ernest Eliel and I credit him for steering our careers into stereochemistry.”

—James H. Brewster, “Fifty Years As A Chemist,” at I.I.C.  
Brown Symposium Banquet, Purdue University, 1991.

“Both Jim and I were first exposed to stereochemistry in a graduate course taught by Nelson Leonard.”

—Ernest L. Eliel, “From Cologne to Chapel Hill,”  
American Chemical Society, Washington, D.C., 1990.

Brewster and Eliel became authorities on the subject and wrote articles and textbooks that were widely accepted and are still used.

In the Spring semester of '47-'48, I taught the undergraduate organic chemistry course for premedical students. It was a favorite course of mine because of the challenge of making those students aware of the general

applicability of the material to knowledge of human chemistry and the practice of medicine. The hope was always that one could surmount initial inattention, disinterest, and skepticism to end the course on an exciting note as the intersecting lines of information formed a pattern that was suddenly recognized by the students in retainable form. It is certainly not my purpose to describe all the courses that I taught during my academic life. Some were more satisfying than others. None was taught more than two years in a row, so that the material remained fresh in presentation. No course was the "property" of any one professor. Moreover, at Illinois we cycled our teaching assignments between graduate and undergraduate levels to assure that professors had commensurate interaction with potential research students.

I do intend to describe briefly, in as general terms as possible, some of the research that attended the teaching and was the real core of my lucky life. A mixture of intention, surprise, defeat, diversion, tenaciousness, diagnosis, temporary confusion, lightning solution, and surprising application defines research—at least, my research over the years. In most cases, a clear statement of a problem presaged a solution. In a surprising number of instances, the solution that was obtained, i.e., the results, required a restatement of the problem and guided us into a new line of research. The research was done with and by undergraduates, graduate students, and postdoctorates, with complete cooperation and open discussion. There were differences in degrees of interaction, diligence, and success. Within the whole process there were many of life's lessons.

Research on antimalarials described in earlier chapters was winding down. Two of my seniors, Frank Long and Lillian Hruda, were in the process of synthesizing pyrrolizidine and substituted pyrrolizidines for the first time. The nitrogen heterocycle was of interest because of its widespread presence in certain alkaloids, broadly defined as naturally-occurring, nitrogen-containing compounds possessing physiological activity. I outlined a logical route of synthesis invoking a condensation and sequential reduction and cyclization steps. When the plan, which started with the reduction of a nitro group to an amino group, was shown to John Stewart, a student in charge of our catalytic hydrogenation facility, he suggested that everything might be done at once under the proper conditions: hydrogenation with a copper chromite catalyst, using pure dioxane as the solvent, at high temperature and pressure. It worked! Frank Long brought me shortly the pyrrolizidine product that had been supposed to be his goal after a semester's work. It had taken only two reactions and provided a general method for making the family of pyrrolizidines. Johnny Stewart would not agree to having his name on our publication. He said

he was just doing his job, for which he was paid as a teaching assistant. When last I was in contact with Johnny, he had become a Dean at Montana State University.

From that first unexpected success, the catalytic reductive cyclization method was developed for the total synthesis of the lupin alkaloids sparteine and isosparteine. The complex tetracyclic ring system present in these compounds was synthesized thereby in two steps from readily available intermediates. The novel total synthesis earned me an invitation to spend a summer at the Canadian National Research Council to work with Dr. Léo Marion, who was a major figure in the isolation and identification of lupin alkaloids. I was able to accept the invitation in 1950, and our family's three-month stay in Ottawa is described in another chapter. Applications of the reductive cyclization method served in the training of graduate students through 1952. The method did not achieve popularity elsewhere, however, probably because of the requirements of obtaining active cooper chromite catalyst and making certain that suitably high pressure and temperature were achieved without leakage of the rocking steel bomb that was used as the reaction vessel. That is, not everyone had a Johnny Stewart in charge of a catalytic hydrogenation facility!

## Kenneth Jan

During the nine months of her pregnancy, Nell improved in health and strength as we followed the strict regimen of nutrition and exercise suggested by the obstetrician. I must say that Nell looked radiant and beautiful. She was excited at each stage in the development of the fetus, while her husband's main emotions were of wonder and concern. The delivery was slow and painful, especially in the final moment, when one of her arteries was ruptured. Dr. Eleanor Payne Cheydleur had trouble stanching the flow of blood, telephoned her colleague in the early morning hour to come quickly to assist her, and told Nell what was transpiring. Nell, both stoic and practical, said, "Shouldn't my husband be called in to say goodbye?" That speech galvanized the doctor, who answered, "Oh, no, it isn't *that* serious," and proceeded to correct the problem completely. When her colleague arrived, it was in time to inspect and approve the result.

We had selected a boy's name and a girl's name. Kenneth Jan emerged healthy, vigorous, and loudly complaining about his new environment. In the waiting room, I had been becoming more and more nervous as time went by until, finally, the doctor reappeared with a full report of the proceedings. Seeing Nell with Ken on her chest was one of the most

beautiful and rewarding sights I have ever witnessed. They stayed in Mercy Hospital, Urbana, long enough for Nell to recover from the corrective surgery and the mild ether anesthesia, which sickened her, and for Kenneth to settle on his feeding requirements. When they came home, everything at the house was ready to receive them. Ken was a funny, jolly baby. His full development is recorded in minute detail in the baby book which is in his possession. That is true for each of the children, so all have individual access to the proud-parent recitation of their progress. Kenny made us all happy. In addition, he could amuse himself for hours, which was a bonus. The name "Kenneth" was derived from the New York City telephone book. All five entries indicated it to be a first name only. He would have none of the name problems of his father, "Nelson." "Jan" was in honor of Nell's adopted brother, who died young. I was fascinated to follow the daily development of a boy child.

## The Visa Matter

It will be remembered that Nell had entered the country on a visitor's visa, which was valid for one year only. An extension was applied for, but it was obvious that the situation had changed. She had married and had a child. She was obviously no longer a visitor! A notice that she would be deported activated me to make many telephone calls to the Immigration Service until I reached a sympathetic agent who said, "We're not going to deport your wife and the mother of your child," and outlined what had to be done. Application for a permanent immigration visa would stay the deportation process. When the new application would be approved, Nell would have to leave the country and reenter on the new visa. The nearest reentry point was Windsor, Ontario, Canada into Detroit, Michigan, which was convenient because we could stay with my aunt and uncle who lived in Royal Oak, a suburb of Detroit, and they could take care of Kenneth while we popped over the border. I do not recall the details, but it went something like this: limousine to the U.S. Consulate in Windsor, where we had an appointment with another sympathetic official for the granting of the visa and return in the waiting car for Nell to reenter the United States as a true immigrant. The procedure worked smoothly, which allayed our nervousness about being border-separated from Ken. Nell applied immediately thereafter for U.S. citizenship. Her marriage to a U.S. citizen shortened the process to three years or perhaps a little longer. Nell was very proud that her official Americanization was underway. Much had indeed transpired in the first year and three quarters since her arrival in New York.

## WHERE DID WE LIVE?

When I first came to Urbana, Illinois, in September, 1942, I walked all around the town looking for an agreeable place in which to live. I had a vision of living finally in an attractive house or apartment after *nine* years of college accommodations. The prospects in Urbana were discouraging, the architecture in general was uninviting, and my salary—none received as yet, of course—was low. My hope did not match reality. In my wanderings, I did notice one house of Dutch cottage style that I thought to be pleasant in appearance, but the occupants did not have room for a boarder, nor were they interested in having one even if they would have had room, as they told this wanderer in no uncertain terms! The address was 606 West Indiana. When the house came on the market in 1953, we were able to purchase it. In 1942, however, I compromised my fantasy in favor of proximity to Noyes Chemical Laboratory and practicality of accommodation. I rented a room in the apartment of Mr. and Mrs. Warren Day at 1208 West California. It was only half a block from Noyes Lab. The Days ran a small campus cafe with hours of early opening and late closing that permitted me some flexibility of schedule. The room was a satisfactory, comfortable living space for a person who would spend most of his working hours in the laboratory. The Days and I became good friends, and I retained the room until early 1947 for Nell's possible use upon her arrival from the Netherlands.

In the meantime, that is, from the fall of 1946, I moved into a small, cozy house at 312 West Washington. I could ride my bicycle back and forth to the University. My hours at the lab were such that I did not notice very clearly the surroundings of the little house. I sent a description of the place to Nell at her request and included "grass and trees" around the house. When she arrived in February, 1947, she was surprised to find that there was very little grass and only one tree. So was I! I thought all houses must have grass and trees around them. My departures at dawn and returns after dark must have simply rendered them invisible! The sub-rental included a housekeeper who appeared once a week to do housecleaning and laundry. In those years, there was an excellent specialty food store only one block away, and the bank and shops of Urbana were close at

hand. Nell found the room at 1208 West California too hot and confining and accordingly accepted a mutually convenient invitation from my older colleague, Professor Harold R. Snyder and his wife, to be a guest in their large, attractive house one block further east on California Street. The Snyders had three children, for whom Nell served as a babysitter on occasion as part of the arrangement.

You will ask why we did not live together. Life was different in the 40s. According to immigration law, as a single unmarried male, I could not even sponsor her visitor's visa to the U.S. That was done by a married couple who were mutual friends. It was necessary for her to live at a different address from mine, which was also favorable for her local reputation in the gossipy university community. Finally, Nell had entered the country on a temporary visa, for which there was no long waiting period, with the idea that it would be her free choice as to whether to remain. She had many war and postwar experiences in Holland to set aside and many new experiences in America to assimilate. We spent much of our time together in the little house at 312 talking, listening to music, cooking U.S. style, and—talking. We had seven years apart to cover for a deeper mutual understanding. We replenished Nell's wardrobe, initiated her into shopping in Urbana-Champaign, and saw whatever sights there were to be seen on foot, by bicycle, and using public transportation. After we were married on May 10, 1947, the house at 312 became our honeymoon cottage.

We did not have much time there, however, because the owners reclaimed the house in June. We were able to find summer lodging at 711 West Washington in a house belonging to Ethel Scott. The paired Draper house was next door. The Scott house had the advantages, along with its smallness and convenience, of having a baby grand piano and a cool basement comprising study, bedroom, and bathroom. The intense heat of the summer of 1947 bent over the candles on the dining room table on the ground floor, as evidenced by some photos of that episode. Friends and university colleagues came to see us, and Nell's circle of acquaintances kept growing. My Oxford research director, Leslie Sutton, visited while on a lecture tour across the country, and we were able to write a paper together based upon my laboratory work of 1937-1939. My first version of the experimental results, sent by post during the war, had never made it to England. It must have ended up at the bottom of the Atlantic.

We heard from both Mrs. Scott and Mrs. Draper about the wonder of a place called Dunewood, north of Manistee, Michigan. As they described that summer community, a dreamy, faraway look appeared in their eyes. I had seen the same type of glow when LeRoy Hamp, my voice teacher at

the University of Illinois, was describing his summer vacations and time spent fishing in the streams north of Manistec. Nell and I kept the eye-glow in our memory, and we were able to sample Dunewood, Manistee, Michigan, first in 1949 and to adopt that magical place from then on for the rest of our lives. In August, 1947, we took a honeymoon trip, all by rail with connecting limousine or taxi, that included a cottage near New Buffalo, Indiana, on Lake Michigan; Boston and Cambridge, Mass.; Stowe, Vermont; ending at my parents' home in Mount Vernon, N.Y. We returned to Urbana in September, but we received notice from Ethel Scott, who stopped by occasionally to play her piano, that she would like to move back in by the end of the year. Housing was tight in Urbana. Rent control restrictions from the war years had not yet been removed. We searched unsuccessfully for some months until my Chemistry colleague, Dr. Therald Moeller, told me of his intended move and the apartment that would thereby become free. We leaped at the chance of renting the first floor of a two-family house at 805 West California. One of the deciding features was the height of the ceiling in the living room. It could accommodate the bookcase that Nell planned to have shipped from the Netherlands.

There were other attractive features of 805. Dee and Marie Hall occupied the apartment on the second floor. They were wonderful people who became lifelong friends and were especially fond of the children, serving as godparents (separately) for two of them. The apartment was convenient to Noyes Laboratory and to a food store, a drug store, and a small restaurant that were clustered only two blocks away. The house was poorly insulated and required regular stoking of the coal furnace, as well as clever banking of the furnace for the night. My first chore each morning was to start the furnace roaring and to light the gas hot water heater. There was only a bath, no shower. I improved the small kitchen seating area by constructing a counter that wrapped around the uneven north and east walls. Dining room, living room, two bedrooms, and a glassed-in/screened-in porch gave us plenty of space, especially since we had very little furniture to begin with. That situation was improved very slowly, following Nell's taste, and then rapidly upon the arrival of Nell's dowry from Holland. Yes, a real dowry! A dowry passed U.S. Customs free. It came in a large container, beautifully and safely packed, that was brought from the railroad station in Urbana (part of the Big Four system in those days) by a derrick tow truck, with police and newspaper escort, and was deposited in the walkway alongside the house. The apartment at 805 certainly looked better with the new additions: the sectional bookcase, made from old wood from a small church in Holland that had been destroyed (the bookcase was readily reassembled); an antique armoire that had been

made in England and had been part of the family's furnishings in Java, also readily reassembled; an antique bureau; draperies, paintings and a memorable portrait of Nell; several chairs, including a baby high chair (yes, we were expecting our firstborn); and numerous smaller articles. With the earlier wedding gifts of a dining room table and chairs and a record player, we now felt very comfortable and ready to invite guests. I had many hospitality debts to repay, and there were many friends for Nell to meet. As for the container for the dowry, I cut it in half, added a slanted, waterproof roof and a small ramp, and painted it, to serve as a bicycle shed. It amused me to see that it remained standing for years after we left 805, although it did reach an advanced stage of dilapidation. We used it for bicycles, baby carriage, then tricycles, and garden tools. No one ever bothered the contents even though the front end was open.

In preparation for the first birth, I was assigned the construction of a wooden crib. The design was Nell's, as well as the concept that a husband should build a bed for the baby. I understood the romantic nature of the concept and also the limitations of the designated carpenter, especially when I contemplated the required design. I placed myself in the hands of a skilled, nearly blind carpenter in Champaign. Every other day, I stopped by his well-equipped shop at 5 p.m. to do 1-2 hours of sawing, planing, gluing, sanding, and painting until the masterpiece was done. He supervised, I built, and then Nell applied, free hand, suitable decorations. The crib stood on a moveable and removable base to which it could be hooked for stability. The crib portion had hand holes that made it easily transportable. By present standards it was rather clunky, but we were very proud of it. When Kenneth Jan Leonard arrived on April 15, 1948, we were prepared with portable baby bed, the decorated Friesian high chair, and a large English baby carriage, Rolls-Royce among such vehicles, that was also part of Nell's concept about proper baby surroundings and transportation. I planted a vegetable garden at 805 during the summer of 1948 in one of my sporadic forays into such enterprises. Our family mobility increased in the late fall of that year. It came about in this way. After a party for my research students at 805, Nell asked me whether I had observed how they had arrived at the house. I presumed they had used our form of transport, bicycles, but Nell informed me somewhat wistfully that some of them had arrived in cars. After some searching, we settled on a Mercury convertible. When the top was folded down, the baby crib could be lifted in and placed on the back seat, where it fit snugly. I imagine that very few people have bought a car on the basis of the proper fitting of a hand-made baby crib.

Nell's imported draperies were used to convert the front porch to a sleeping porch for us, which freed one of the bedrooms for visitors. With

the arrival of Marcia Louise Leonard on November 15, 1949, we introduced some flexibility into a bedroom/playroom arrangement, and Nelson did additional carpentry to add a play bench, many shelves, and a moveable box for playthings. Why all this detail? Simply to illustrate Nelson's occasional adventures in carpentry that otherwise might be lost to history. An outdoor sandbox completed his efforts. The arrival of James Nelson Leonard on August 15, 1952, posed a space problem. His crib—the decorative initials on the crib were changed each time—was placed in an alcove off the front room and partly under the stairway leading to the second floor. We were beginning to feel cramped. In the fall, one of my faculty colleagues, Carl Vestling, told me that his neighbor was preparing to sell his house at the start of 1953, was doing so privately, and would like to sign a contract of intent as soon as possible. The incentive for us was that he was the present owner of the house at 606 West Indiana to which I had been attracted when I first came to Urbana. Measurement of the height of the dining room ceiling indicated that the precious bookcase would fit. Everything else was satisfactory. We plunked down the necessary earnest money.

The total purchase price of \$22,000 for the house belonging to Ralph Grim was met by \$12,000 in cash that we had saved plus \$10,000 in a loan from Champaign Loan and Building Association, arranged by our friend, Wally Mulliken. We were able to move in after January 12, 1953, which did not leave much time for getting settled before we left for Holland at the beginning of February. However, we managed to put the house in order, but I must say that I was a complete innocent as to the requirements for furnishing a house and the cost thereof: shades, draperies, curtains, lamps, rugs, beds, chairs, kitchen furniture, etc., etc. What a blow! Just before we left the United States, we discovered an invasion of termites in the basement of 606, so the house had to be fumigated immediately after our departure. Among the simple joys of new ownership, I counted the ability to take a shower very high on the list. The two stories provided the first opportunity for adult and child privacy, with the additional calm that ensued.

When we returned from Europe in the spring, we began modifying the house and surroundings in earnest. New landscaping and planting had to be done. We converted the coal furnace to gas heat, tiled the basement floor in the process of converting the two large rooms to a play area for the children. We covered up the pipes, ducts, and beams with acoustical tile, and we introduced fluorescent lighting. The basement became a cool retreat in summer and a great place for activity, even roller skating, during the cold of winter. Construction projects from wooden blocks and toy

train bridges and trestles made it a fantasy land, especially toward Christmas each year. The screened-in porch was repainted in a bright color, and a Ping-Pong table attracted considerable attention. I remained an occasional contestant until I lost all interest when all the boys managed to beat me consistently.

By 1962, with the four children now aged 8 to 14, we needed more space, and major construction added a family room, doubling as the parents' bedroom, with bathroom and closet, and a new garage. The second floor was modified so that Marcia and the boys had separate half-bath and bath, respectively. There was even room for the Norwegian elkhound, Taina, that we had acquired in 1959. We had just completed repayment of the first ten-year mortgage when the new construction required us to borrow again, even though we received some timely financial assistance from Nell's mother and her Aunt Lien. Central air-conditioning and central humidification came later. Just for the record, the total cost of improvements during 1953-1987 was about \$23,000. After Nell died, I spent about \$4,000 preparing the house for sale—at a price of \$135,000. Although a large appreciation in value was realized during the 41 years of possession, all of the figures cited are remarkably modest when compared with prices on either coast and in most larger cities. The cost of housing in Urbana, Illinois, was not a major factor in our family budget, with the result that we could and did invest in vacation housing.

## ILLINOIS YEARS—1948-1953

### Family

The years 1948-1953 are bounded by Nell's reentry into the United States as a permanent resident and by her return to the Netherlands on a visit during my first sabbatical leave, which we spent in the Netherlands and Switzerland. We had our first car, a Mercury convertible, and we drove it across the country to New York during Christmas vacation, 1948-1949, to show off Ken to all the family. The visit was particularly for my father's benefit, for he was interested in the continuation of the family name as he himself was facing death with terminal cancer. Ken, christened in my father's bedroom, was idolized by all and responded appropriately. He was on the verge of being spoiled by the time it was necessary for us to return to Illinois. Nell's mother flew from Amsterdam to Chicago (with a stop in between) on an early KLM transatlantic flight in order to see Ken and to visit us in our little place in Urbana. Her visit in 1949 was timed for Ken's first birthday. I am certain that it was important for mother and grandmother to be together. The special information could also be shared that Nell was pregnant (tomato-juice indication) with our second child. My mother came to visit somewhat later, following my father's death and her partial recuperation therefrom. The amusing grandchild sped her further recovery, and Nell and she shared happy moments together. Summer brought the first opportunity for us to spend time in Dunewood, Manistee, Michigan, as amply described in the chapter on "Vacation Homes."

Nell started experimenting with attendance at several of the churches in Urbana and Champaign. She decided that the Congregational Church in Champaign was most similar to the Remonstrante Kerk that she and her mother had attended in the Netherlands. It did not require belief in one particular creed and was administered by the congregation, as the name implies. This was all preparative for the christening of the next baby to come.

## Marcia Louise

Marcia Louise was born November 15, 1949. Everything went smoothly this time, with Dr. Cheydleur again assisting. I was amazed at how early in the life of this baby the femininity was evident. The selection of the name “Marcia” was made because it was euphonious, and “Louise” was of course Nell’s given first name. Ken found his new sister highly agreeable. Photographs show him with Marcia lying on his lap while he pointed out or poked her nose, mouth, eyes, and ears, and practiced his vocabulary accordingly. It was a time of great activity in the house—playing, hugging, singing, feeding, doing laundry, taking turns getting up in the night, and taking walks in the day. The summer of 1950 saw us in Ottawa, Canada, and that saga is told elsewhere.

By 1951, the household was running smoothly. We had the necessary help and babysitting services, so that Nell and I could engage in our favorite activities. Mine were chemistry and singing, both of which involved some traveling. Nell’s were tennis and golf (on the University’s 9-hole course) plus a social life that developed from contacts at church and at the University. There was an organization called “Chem Wives” that met regularly, something quite foreign to present custom and the avoidance of discrimination. There were frequent concerts in the University’s excellent Music School. Nell started attending meetings of the League of Women Voters in order to gain information for her conversion to being a U.S. citizen. She was delighted to find that women who differed strongly in their political views could be good friends and could find common democratic purpose. A month in Dunewood in the summer of 1951 was ideal, and strong, permanent friendships were developed there which helped to guarantee our return in all subsequent summers when it was possible.

Early in 1952, we learned that another baby was on the way. Accordingly, I played a more responsible role in amusing Kenneth and Marcia. I am saddened that neither of them now remembers particularly the Sunday morning outings to the north of Champaign, where we could watch the steam engines being shifted in the roundhouse and then being attached to the freight cars in the marshaling yard of the Illinois Central Railroad. It was a fascinating procedure! I can only conclude that my children considered it mainly a time for Daddy’s amusement, when he could smoke a pipe, survey the Sunday paper, and watch the engines and trains in slow motion. Dee and Marie Hall (Marie died in 2002 at 100!), our upstairs neighbors, played an important role in helping to entertain

the two children, especially Kenneth. My mother came out again from Mount Vernon to indulge herself with two grandchildren and to help in the household. Indulgence won out because she broke her arm in stepping down from a ladder. As the weather turned warmer, we provided an inflatable wading pool in the yard. Ken and Marcia were customarily joined by some of the neighbor children in the wet romps that ensued.

## James Nelson

James Nelson was born on August 15, 1952. While he had been a somewhat reluctant resident several times during Nell's third pregnancy, at the birthing time he was reluctant to depart (arrive) and some medical induction was necessary. In consideration of our later acquaintance with James' demonstrated planning concerns and organizational skills, I amuse myself by thinking that his hesitation was occasioned by such questions as the following: "Have my parents arranged for suitable food and shelter outside the womb? What will the temperature be? Will my environment be wet or dry, etc.?" This big baby was named after a "James" that Nell had loved in kindergarten in Shanghai, China, and "Nelson" was also my father's middle name. He was a smiler and a kicker, also very fond of food. He was to charm Oma Vermey and the Dutch relatives when we all went to Holland in 1953.

## Research

My research publications resulted mainly from the work of undergraduate seniors and graduate collaborators on the antimalarial program, but, starting in 1947 and accelerating during 1948 and 1949, the work of my own graduate students started appearing in the *Journal of the American Chemical Society* and the *Journal of Organic Chemistry*. My first Ph.D. student, Karl M. Beck (1948), went into pharmaceutical industry, as did three from the 1949 class. Two who received their degrees that year went into teaching and the rest (seven) became involved in industrial chemical research. Roger Beyler, then at Merck, appeared on a U.S. postage stamp in 1951 commemorating the 75<sup>th</sup> anniversary of the founding of the American Chemical Society. Donald L. Felley became the President of the Rohm and Haas Company, and Scemon H. Pines, when near retirement, received a monetary award from Merck and Company, with which he sponsored an annual graduate student symposium for the

Department of Chemistry at the University of Illinois. The research areas described in the publications included an analysis of the dependence of spectroscopic properties of 1,2-dicarbonyl compounds upon their steric configuration, determination of the relative stereochemistry of Senecio and Lupin alkaloids, and related catalytic hydrogenations that resulted in expedited reductive cyclizations, i.e., in one step. Also included was a series of papers on the role of intramolecular interactions in reductive transformations, e.g., of alpha-aminoketones. Sufficient evidence of the adequate direction of graduate students and for originality in organic chemical research was gathered thereby so that I was advanced to Associate Professor of Chemistry on a tenure track in 1949. Study of alkaloid synthesis, reactions, and stereochemistry was to intrigue some of my research students for a decade, and the area of molecular rearrangements was a subject of worthwhile concentration for 40 years in many guises. It is interesting that I was never concerned about tenure. I was enjoying the teaching, the research, and student interactions so much that I trusted my senior chemistry colleagues to take care of any advancement I deserved in salary or status. I don't know whether this was true for Nell as well, because she had a greater recognition of our increasing responsibilities, but at least she was aware that I was very happy in my work, demanding as it was.

Upon our return from the summer of 1950 spent at the Canadian National Research Council in Ottawa, where I worked in the laboratory of Dr. Léo Marion, we resumed our domestic and university-directed life in Urbana. In research, the publications with Marion appeared, the reductive cyclization methodology was applied to other ring systems, and the chemical reduction of alpha-aminoketones found further application. We wanted to dissect the latter process and to search for intermediates. Electrolytic reduction provided several answers to our quest. Sherlock Swann, Professor of Chemical Engineering at the University of Illinois and a world expert on electrolytic reactions, provided guidance as to apparatus, proper electrodes, and conditions. E. I. DuPont de Nemours and Company, Inc., provided funding in the form of an unsolicited, unrestricted grant. Hugh L. Dryden, Jr., an M.I.T. Ph.D., who was my first postdoctoral research associate to benefit from the grant, did the work. The result was a very thorough and practical analysis that could be extended to a new electrolytic method for making medium-size rings (9-12 members) containing nitrogen, otherwise very difficult to obtain. The novel synthetic process was the work of graduate students John Figueras, Jr., and Edward H. Mottus. Of the three research colleagues mentioned, Hugh and John were musical and had the unique

ability of playing the organ. The surge of papers that we placed in the chemical literature aided in my advancement to Professor of Organic Chemistry.

My first patents appeared in 1951 and 1952. Eli Lilly and Co. assisted in the preparation of three patents on the synthesis of sparteine (#2,561,326-8). As far as I know, they were never utilized commercially. Natural sparteine has the pharmacological effect of modulating the heartbeat of a horse. It is used in veterinary medicine, but it was banned for use in race horses. Two patents resulted during my consulting period with Phillips Petroleum Company in Bartlesville, Oklahoma. Both were based on air oxidation, with no catalyst involved. According to my contract, I was awarded \$25 at the time of application and another \$25 at the time of issue of the patent, in addition to my stipend. It would have taken many patents to have made the exercise worthwhile! One of these (#2,594,322) involved the air oxidation of methylcyclohexane, a product produced in excess in the "cracking" of petroleum fractions, and its acid conversion to bifunctional open-chain products for use in polymer synthesis. The other (#2,757,110) started with the air oxidation of a by-product of polyacrylonitrile manufacture and its conversion to pyridine-2,5-dicarboxylic esters. I was drawing on slight experience, great hope, and some intuition when I suggested the end use of these products as insect repellents. A new and very competent entomology laboratory at Phillips, in fact, declared them to be ideal in this property. One of the diesters in particular was selected for large-scale manufacture. It had no appreciable toxicity to animals or man. A solution could be "painted" on a cow, and the animal would not be bothered by flies. It could be sprayed on the inside of a cow barn, and flies would not settle on the walls. It could be painted on a vegetable stand outdoors, and flies would not bother the product. "Ideal," one might say! The quantity that could be sold was too small, however, for a petroleum company to market. As a result, the patent was sold to an agricultural supply company, MGK, for \$50,000, and they made and marketed the insect repellent for many years. When I last checked the production figures in the early 80s, they were about 2,000,000 pounds per year. However, shortly thereafter, the farm economy suffered losses and the MGK Company went out of business. There it is, a near-perfect insect repellent with no one producing it, partly because it is more expensive than the popular DEET and also because the patent guaranteeing exclusivity has long since come into the public domain. I lost my consulting agreement with Phillips and gained a new one with the Monsanto Chemical Company, with regular visits to Dayton, Ohio, and St. Louis, Missouri.

During the fall semester of 1952, we started planning for moving into the house at 606 West Indiana Avenue in Urbana that was to become ours on February 1, 1953, and for traveling to Europe shortly thereafter, as described in the chapters on “Where Did We Live?” and “Sabbatical Leaves.” I spent some time organizing five talks to offer the Swiss-American Foundation for the speaking tour of Switzerland that would be part of the sabbatical. In retrospect, the number was excessive and should have been two or, at most, three. I was too enthusiastic! Not all of one’s work certainly deserves international attention. It was an important lesson for me to learn.

## VACATION HOUSING

While Nell adapted readily to the flat country of Illinois, both of us missed a body of water for swimming, canoeing, and sailing. Our first opportunity for a summer vacation came in 1949. We remembered the glowing eyes of Mrs. Scott and Mrs. Draper when they described their family summers in Dunewood, north of Manistec, about halfway up Lake Michigan's eastern shore. The community of **Dunewood** had been bought from the U.S. Government by a group of University of Illinois professors after it had been timbered off by the lumber barons. In 1913, the decision was made by the professors to build cottages on the sand hills among the second-growth beeches, birches, and pines and to provide access for all members of the community to reach the beach, which was about three-quarters of a mile in length. We rented the "Forbes" Cottage from Ethel Forbes Scott for two weeks during the summer of 1949 when Kenneth was one year old. The Forbes Cottage was one of the original eight cottages, most of which, in true resort style, are still called by the names of their original owners.

The cottages were comfortable, if somewhat primitive, and the surroundings were beautiful and were quiet except for the sounds of nature. The 400-mile car trip from Urbana ended in seven miles of corduroy dirt road, the so-called Chippewa Trail, to reach Dunewood. Further north, the road continued around Portage Lake and through the village of Onekema. Shopping could be done in Manistec or Onekema, firewood was easily chopped from dead timber, and blueberries, blackberries, and apples could be picked nearby. The region was and is also known for its cherries and peaches at the beginning and end of the summer season. The woods, with only sparse undergrowth, were for tramping and exploring. The beach was broad and magnificent; the lake, cool and clear, was quiet in the morning and usually wavy by afternoon. We felt we had found a paradise, but actually a near-paradise since that first year was not without anguish. Kenny, who took to the water as though he had been born in it, which—in a way—he had, developed a viral pneumonia for which there was no cure via sulfa drug or antibiotic. Luckily, he overcame the infection. I managed to chop into my leg instead of a

target log, but the deep hatchet cut was clean and the skin could be pulled together satisfactorily. We did get to know some reliable doctors in the area. To add to these events, we had a series of days of rain, spent in reading innumerable books Nell and I had brought along "just in case."

The good must have outweighed the bad experiences. We returned to the Forbes Cottage again in 1951 when Marcia was close to two years old; James celebrated his first birthday on the beach in 1953, and we ventured to introduce David to Dunewood in 1954 when he was only six weeks old. We stayed in the larger Scully Cottage in 1953, 1954, and thereafter until we could purchase our own cottage. In those days, it was wise to be away from the heat of central Illinois in late summer due to the threat of polio; accordingly, there was an extra reason to feel relieved and to relax upon arrival in Dunewood. We became more and more efficient in travelling between Urbana and Dunewood. If we left very early in the morning, the children would sleep during the first half of the journey and the first stop (there was occasionally no second stop) would be for breakfast. We developed favorite places along the way. The most enterprising journey that I recall involved seven of us. Nell was in the front seat, David as an infant was between us in a basket, Grammy (my mother) was in the back seat with James, Marcia slept on the blanketed and pillowed floor during the first half of the trip, and Kenneth slept behind the rear seat in the reinforced receptacle for the convertible top. Our friends were amazed at everyone's tolerance of the close packing. After we acquired a dog, her place was regularly behind the rear seat, and three of us, with some rotation, occupied each seat, the front being of the bench type and therefore roomy. The trips back and forth were not devoid of adventure—flat tires, spilling of raspberry jam, stomach upsets, excessive "b.c." (body contact), fortuitous avoidance of accidents, etc.—but anticipation helped to make the trips pleasant and, because of family habits, jokes, reading, and games, they were actually fun.

The southernmost Dunewood cottage on the east side of the Chippewa Trail was occupied by a widower, John Law, who had bought the cottage from the original professor owner, Adam Strohm, who had become librarian of the Detroit Public Library. Mr. Law was uncharacteristically concerned about such territorial matters as his exact property lines (fencing was installed), liens for granting Dunewooders the right of passage, the common water supply (he was the only one to install a bathtub), tree-trimming (on adjacent Scully beach property to improve his view), and the question of participation in group assessments to make improvements in common property. He never really accepted the idea that he was part of a community, and the Dunewood community did not accept him because

of his lack of cooperative spirit. Matters came to a head in 1959 when rumors started circulating around Dunewood—rumors were always circulating around Dunewood—that Mr. Law might be interested in selling or sharing his house. Because Mr. Law was not on speaking or visiting terms with any of the cottage owners, it was difficult to ascertain his wishes. We,



The four children, Dunewood, Michigan, 1962

however, were merely renters and therefore neutral. Nell adopted her characteristic direct approach and suggested that we visit Mr. Law to talk with him about the property, which we did. We asked whether he was interested in selling the land and cottage. He responded by asking why we were interested. I told him that we were ideal buyers. We knew and loved Dunewood. We had four children who enjoyed the woods and beach. We had outgrown all the rental property, while his house, which he kindly showed us, had four bedrooms in addition to kitchen, living room, screened-in porch, half-bath, and tiny bathroom with tub (he now had his own well), along with a garage. It was ideal for us, the largest family who frequented Dunewood. Moreover, the fact that he had lost his right to cross the Scully land to get to the beach did not present a problem for us because, with our purchase of the northernmost lot in Dunewood from the Scott Estate in 1958, we had the right to cross both Scully and Wallis (which used to be Scott) land to reach the beach. Sensing that he actually might be willing to sell to us, Nell inquired as to his asking price. It was \$12,000 cash. We countered with \$10,000, a figure I thought we might be able to raise, with a little help from Holland, by October. We settled on \$11,000, at which point Mr. Law asked my religion. I related that I was confirmed in the Episcopal Church but that I hadn't attended that denominational church for some time. He said that was exactly his situation and that we could therefore confirm our agreement by a handshake, which we did. What else helped? Probably the fact that I admired the crazy quilt hanging over the balcony railing, made by his mother in 1890-something, and could claim that I had a similar admirable piece of handiwork that my grandmother had made in the same period. Who knows? He was inscrutable. Nell and I walked back to the Scully

Cottage in a daze, saying "Do you suppose that we have actually purchased the cottage?"

Mr. Law visited us the next day and asked whether we had perhaps been negotiating on behalf of Margaret Scully, with whom he was in a territorial war. We could assure him that we had not breathed a word about our agreement to Mrs. Scully and that we wanted the house for ourselves. Indeed, we were anxious to keep the negotiations secret until the sale was consummated. There were too many scatterbrained ideas loose in Dunewood. Mr. Law's visit did energize me to call our friend, Wally Mullikan, of Champaign Loan and Building, in order to learn what paperwork we could do to fortify the Episcopalian handshake. He dictated a letter of intent, which I typed and presented to Mr. Law, together with a check for \$1,000 as earnest money. He must have felt the need for fortification as well, because he had prepared a similar letter of intent, but from the seller's side. He was satisfied with my letter and earnest money, and there followed a less ecclesiastical handshake. Exchange of the property took place in October of 1959.

We crossed Lake Michigan on a ferry from Milwaukee to Ludington with Hans and Betty Frey for the celebration. We stayed in their cottage and immediately after the transfer of ownership, the four of us had a symbolic pushing down of the fence that Mr. Law had installed between their lot and his, now ours. We also regenerated the pathway that the Freys could use in traversing our property on their way to the beach. It was a very joyful occasion, dimmed only partially by the discoveries of invasion of powder post beetles in the flooring, invasion of termites in the stairway to the porch and in the roofing of the porch, and perviousness of the house to mice. The cottage at 6829 Lake Shore Road and the grounds have been improved each year and are continuing to be improved now that they are in the children's hands. Mr. Law never returned to the house. He did spend summers in Manistee, where he bought a small apartment, and the rest of the year in Covington, Kentucky, across the river from Cincinnati, where the state taxes were lower. As the years progressed, so did Mr. Law's peculiarities increase. He finally checked himself into an asylum and had his demise announced so that friends would not know about his mental incapacity. It was an act of some courage, to my way of thinking.

The Harno Cottage was across the road from 6829 and was the southern-most Dunewood cottage on the lake side. Each year the erosion cut the high bank further and further back until finally the structure itself was threatened. In the early 1970s, we sent a warning to the Harnos while Jim and Toni were in Africa, where Jim worked for Texaco, but they made

procrastination a vocation. It was not until they made a biennial summer return to Dunewood that they recognized that a false step from their front porch might mean a drop or slide of 30 feet down the cliff. There was no reserve land on the west side of the road. We offered them, with some urgency, part of our large, northernmost lot on the east side of the road. They decided that they could not accept an outright gift and offered in exchange two small pieces of land on the west side of the road, the remainder of the original cottage site and a 90-foot long piece of land next to it. The former was actually offered to us at a later date because they maintained the sentimental notion that they would use the old cottage site for picnics, enjoying the Lake Michigan view they knew so well. No picnic ever occurred. The Leonard children now own the two pieces of land which continue to be taxed as though they had some value, which is certainly doubtful. Just in time, insofar as I can estimate, the Harno Cottage was moved intact to the portion of our lot on the erosion-safe side of the road and duly secured upon a new garage foundation. We requested and obtained the right of first refusal if they ever decided to sell.

The opportunity for us to buy came sooner than one might have imagined or desired. It resulted from a series of family tragedies. One of their daughters, an autistic child, had been removed earlier to a California care facility. The other daughter, Lindy Harno, a clever engineering graduate of the University of Michigan and an intrepid sky diver, was killed in a freak automobile accident. Jim developed a cancer of the sinus that was impossible to contain and proved fatal, and Toni soured on Dunewood, where she added to her complicated and now lonesome life by breaking a hip in a fall. We purchased the house at 6999 Lake Shore Road in 1981 at Toni's asking price and found out immediately that it had many imperfections due either to Jim's procrastination or to his constructive additions and "improvements." Jim was a delightful friend and a highly competent engineer in the oil and gas industry, but it has to be remembered that he was also the only officer in the history of the U.S. Navy to take a submarine down with the hatches open! The unfinished second floor of the house had a central corridor and tiny box-like rooms. It was unsatisfactory in its 1981 condition.

I claimed that I was too busy in the early 1980s to become involved in a planning and construction project. It would be up to Nell to supervise. She decided very properly that if she were to supervise, she should also be in total charge of funding, which she managed by transferring necessary capital from our Dutch account that was controlled by her cousin, Hans Dinger. Nell engaged a building contractor who had experience in designing and building summer cottages around Manistee, she had

architectural guidance from Jim Carlson, Tom's father, and she enlisted Marcia to help with the decorating and furnishing process. In due course, Jim Leonard was of special help in landscaping because of his avidity for cutting and timbering. For effective supervision of the reconstruction and new construction to proceed on schedule, Nell had to make several on-site visits in 1982. Her solo trips by car between Urbana and Manistee were very fast and cemented her reputation as a very "efficient" driver. In fact, she proved several times over that she deserved the approbative nickname "Parnelli Leonard," a takeoff on the name of a famous race car driver. I merely gave my hearty approval of everything that was being done, although I did have some input as to the design of the new deck and the stairs leading up to it, namely, the simplest part of the exterior. The end result was attractive, both inside and out. The tower stairwell that was set to one side allowed the second floor to be rearranged so that the new upstairs corridor ran along the east side, which guaranteed that the bedrooms upstairs became of reasonable size: one single, two double, with a large double bedroom over the screened-in, glassed-in porch. Adjacent to the tower extension was another double bedroom on the first floor, and the first floor was also extended to the west to incorporate a new kitchen, with southern and westward exposures. There were (are) two bathrooms equipped with shower and an extra shower in the basement laundry room. The house has its own well. It is now a hospitable summer cottage with space for two Leonard families. We hope now that the two cottages will be referred to as the Upper (or North) Leonard Cottage and the Lower (or South) Leonard Cottage, but such name changes may take time for the other members of the Dunewood community to assimilate. The transfer of the two summer vacation homes and three lots, two of them tiny and one large that contains a possible building site, to the joint ownership of Kenneth, Marcia, James, and David was finalized during 1992 and 1993, according to Nell's wishes expressed earlier. Do the children still love Dunewood? All of them return in summer when it is possible. Their four spouses were guests in Dunewood before they were married. Two marriages were celebrated in Dunewood, David's and Marcia's. To provide family continuity, the minister, Edward Meury, who was my friend from kindergarten in Mount Vernon, New York, presided at the wedding of Elena and David in 1978, as he did at the wedding of Nell and me in 1947. All of the grandchildren have experienced the re-attractive power of Dunewood and Lake Michigan.

What, specifically, were (are) the attractions? Kenneth and Marcia learned to swim in Dunewood. James and David learned to swim at Indian Day Camp in Champaign, Illinois, but they loved the long swims that

were possible in Lake Michigan. We all did body surfing when the big waves permitted. The long surfboard that I had purchased from Donald Cram of UCLA chemistry and surfing fame was used either in the super waves or for floating sun baths on calm days. While Marcia was not interested, the three boys did their first fishing under my unreliable but earnest direction in Portage Lake. I remember very clearly the last time I offered my services. They were to unhook the small perch that David kept reeling in. When he had caught 17 within a short space of time, he said, "This is boring," to which I replied, "See how many all of the other kids in the rowboat have caught? None!" David had confirmed the basis of the biblical advice, "Cast your nets on the other side." We canoed down the Little Manistee and the Pine Rivers. On one particular ride through mild rapids, all the canoes overturned in the group except the one Marcia and Kenneth were paddling, with James seated low in the center. I claimed their good luck was due to the fact that neither of them was wearing glasses, so no one could see the dangers that lay ahead. It was, in fact, in Michigan that we first learned that Marcia needed glasses. She could not follow the balls that she hit during her first golf lesson. The boys all received lessons from the pro at the Manistee Country Club, Edmund O'Connor. Nell was a good golfer, well coached in Holland. I enjoyed playing golf with her and occasionally with another couple. She played regularly with the women of the Club, which we joined on summer family membership. Jim remembers playing with Nell particularly during the summer of 1968.

The boys and I had our greatest satisfaction in cutting down trees and having them fall exactly where we desired, in chain-sawing them into fireplace lengths, and in splitting them the following year. Cleaning up the brush was not nearly as much fun. Occasionally there were disappearances from the team when it came time for brush clean-up. We required a professional tree service to cut two large cherry trees next to the driveway leading to the South Leonard House, and we followed these to the sawmill, where they were converted to planks and 4x4s, and, after drying, into a fine round table and two low beds. Kenneth mapped the woodland trails and, together with Chip Frey and John and Robby Sternfeld, constructed forts and secret hiding places. That group was aloof from Marcia, James, and David, but all were equally at home in the woods, especially if they remembered to take a compass with them. The highest premium was placed on freedom, as expressed in our two parental rules while the four were growing up: 1) do not go swimming unless there is an adult on the beach near you; 2) come home when you are hungry. We assumed they would have the good sense to look both ways before crossing

the Chippewa Trail, which became more of a hazard when it was asphalted and widened. Nell, too, valued her complete freedom in Dunewood. It became clear to me that she would find it unfriendly of me to ask where she was going or what she was planning to do next. Nell called it her "most favorite spot in all the world." She could do anything she wanted. One thing she loved to do was read on the screened-in porch of the South House. Nell and Marcia shared a love of summer reading and were champion patrons of the Manistee Public Library.

There were summers of frequent beach fires when there was abundant driftwood, summers of racing Sailfish; summers of canoeing down the rivers; summers special for the number of Petoskey stones and "weather glass" that could be found; a summer of beefsteak red fungi that appeared on the trees; a summer when Jimmy Kiszlik left a trash fire unattended in a wind that scattered the embers among the brush and trees, portending a disaster that the whole community turned out to avert; a summer when our first Norwegian Elkhound, Taina, perfumed herself by rolling in unspeakable material and another when our second one, Malu, unashamedly produced a litter of hybrids (she had produced earlier a full complement of thoroughbred Elkhounds under supervised mating); summers when either dog was the victim of porcupine curiosity; summers of painting houses; a summer when Nell's sister Hilda Renardel de Lavalette was with us trying to recover from her husband Paul's death; and Nell's final summer in Dunewood (1986) when Jacqueline Vermey-Volk, her father's widow, was visiting and the two women became very close friends. Each of the children had friends visiting at one time or another, and many of our friends came to know Dunewood. Only one couple, our dear friends Victor and Susan Stone, bought a lot and built a house in Michigan, just north of us and across the road. We are lucky to have them as neighbors.

There were expeditions to Sleeping Bear Dune, Tippy Dam, Caberfee, the Lookout Point on Michigan 22, the Lighthouses at Manistee, Portage Lake, and Frankfort, the Morton Salt Works in Manistee, the Ferry Boat docks in Frankfort and Ludington, the Rock Shop in Onekema, the Trading Post in Beulah, the forestry preserve and the fire tower (to climb), and—on rainy days—the Historical Museum or the bowling alley in Manistee. Favorite eating places were the Cherry Hut in Beulah and Sand and Ski in Cadillac. For entertainment, there was the County Fair in Onekema, great music at Interlochen, and thespian performances in the Ramsdell Theater. For "sport" shopping by the ladies, there was the factory outlet of Glen of Michigan; try-ons were encouraged but no dressing rooms were provided.

The children were not limited to the summer experience of Dunewood and Lake Michigan. Ken spent separate summers at Scout Camp (Drake)

in Illinois, Prairie Trek (in the Southwest), and Bay Nothing on the Current River in Missouri. Marcia was at Grassy Lakes Camp in Southern Illinois and Camp Kehonka on Lake Winnepesaukee, New Hampshire. James spent two weeks at Scout Camp one summer and two summer periods at Broken Arrow, a ranch near Gold Hill, Colorado. David had two summers at Red Arrow Camp in Wisconsin and while there became an expert in canoeing and portaging in the border lakes country.

What about winter vacations? First, I must describe an addiction to skiing that permeates the family, or, rather, the Leonard side of each family. The distaff side of each family provides a devotion to the sport as well. I began skiing in Austria in 1937-8, and Nell and I skied together in Switzerland in 1938-9. It was not until the end of January, 1945, that I could take a vacation from wartime research and the teaching of army, navy, and civilians at Illinois, to spend a week at the Beavers' Lodge in Winter Park, Colorado. I fell in love with Colorado and with Colorado skiing. My first pair of wooden Northland skis had no metal edges, but technology improved slowly and allowed me to have metal edges attached for my second foray to Winter Park in January, 1947. My friend Stanley Cristol at the University of Colorado assisted in these adventures by inviting me to give a chemistry seminar talk in Boulder at the end of the ski week. The honorarium of \$50 was very helpful because a week of lessons and ski tows in those days cost only \$69 or \$79 as I recall. I had two ski trips to Winter Park in 1950s, one for Kenny and me and a later one for Nell, Marcia, Kenny, and me. Then, we shifted allegiance to **Aspen, Colorado**, largely because of my colleague Kenneth Rinehart's description of the skiing there and because of Stan Cristol's description of reasonable family accommodations, namely, at the Hillside Lodge.

The accommodations were, indeed, reasonable. A double room in the converted old jail was \$8.00 per night, and the children's room across the hall was \$24.00 per night. It had four beds and the necessary kitchen facilities, so that Nell was able to cook the suppers



Skiing with Ken, Winter Park, 1958

that the children liked. Continental breakfasts were supplied by Hillside Lodge, lunches were taken on the slopes, and we treated ourselves to an occasional dinner out. How did we get to Aspen? We drove to Galesberg, Illinois, left the car at one of the local garages, and waited for the California Zephyr. I say “waited for” rather than “caught” because the train was invariably late. Upon arrival in Glenwood Springs, Colorado, we changed to a bus—at least in our first year, 1960—that deposited us just one block away from Hillside Lodge. In subsequent years, our improved experience was to hire Little Percent Taxi for our transport between Glenwood Springs and Aspen. They had a stretched-out version of a Pontiac that had been converted to a seven-passenger vehicle. The whole travel process was made possible through the cooperation of the children, each of whom was limited to one suitcase that he or she could carry, although we did offer David, age 6, and James, age 8, help when they needed it. The anticipation of the train journey and the actuality of the sleeper berths, meals on the train, and viewing from the dome car made it a worthwhile adventure. In later years, our alternative routes were to fly to Denver and drive to Aspen in a rented car or to fly to Denver and to Grand Junction and then drive from there to Aspen in a rented car. The latter route had the advantage of not having any mountain passes for us to negotiate in the fickle winter weather.

Five of the Leonards took lessons and skied every day. Nell, who had injured her knee early in her skiing career, roamed the town, made friends, and, after Vance and Ellen Grenko had taken over the operation of Hillside Lodge, offered help and advice to these natives of Oklahoma who were neophytes to both lodge-owning and skiing. Friends showed up at Hillside Lodge, including the Frieds and the Djerassis. Dan and Natalie Alpert stayed at a B and B next door, Hans and Vreneli Frauenfelder stayed in town, and we looked forward to seeing the regulars of Hillside each year. Marcia had the company of her cousin Claire one year. However, we were fast outgrowing the accommodations.

As part of Nell's excursions about Aspen in the beginning of 1966, she took a tour of the new ski area that was being developed in adjacent Snowmass-at-Aspen, as it was called originally. She could hardly contain her enthusiasm. She bubbled about the views from the lots in Melton Ranch I, and she urged me to buy a lot before the price went up. On a second visit to the Ranch area, she even decided which lot offered the best combination of view and convenient access. I was taken along on the next visit, I fully agreed with her selection of lot 32, but I did not have the necessary \$9,000 initial asking price. Nell convinced me to borrow the money, because she sensed with accuracy that the opportunity would never

return. I paid a deposit of \$1,800 and signed a promissory note for \$7,200 to be paid off in five years at 7% interest. That was conservative. The promissory note was paid off ahead of schedule, on February 23, 1968, and it was time to think about building a house. If I did not have enough money to buy a lot, how would I finance a ski lodge? Once again, Nell gave me the encouragement at least to plan a house, which we started in 1968 with the architect George Heneghan, after seeing some of the work of the partnership Heneghan and Gale. George's first design was, however, conventional and uninteresting. I suggested that I was only going to build one house in my lifetime, a mountain house and not a city house, and that all the rooms should embrace the view. "Embracing" was possible if one envisaged a central portion as a hexagon and attached two wings on the "a" and "c" sides, one side for the parents and the larger side for the four children. George took it from there and "placed" the structure ideally on the hillside so that the main windows had sweeping views from northeast to south.

My Aunt Kate had died two years previously at age 91. As executor of her estate, I had been using the inheritance, as required, for the support of her unmarried sister, Florence Leonard, who was confined to a nursing home in Mount Vernon, N.Y., during 1967-1968. I visited her several times during that year to ascertain that she was appreciated and was treated well. She was generally at peace, even jolly, but she was hallucinating more and more, drifting off into a pleasant world of her own imagining. She even wondered aloud to her nurse, when I visited, whether it was proper to entertain a gentleman in her bedroom, but that she did! Aunt Flora died at 93 in 1968, and the residue of the original estate of George and Kate Macbeth came to their only surviving nephew, myself.

The total amount, in stocks and bonds and cash, was sufficient for us to build the Snowmass house, which we then contracted to do. George Heneghan, our architect, supervised the construction during 1969-1970. Because I was uncertain of the economic climate, I converted the estate's stocks to U.S. Treasury Bills that would mature quarterly during the construction period. George was very conscientious about obtaining lien waivers every time I paid the contractors and subcontractors. This enabled us to realize a cost that was within \$3,000 of the original estimate. There were other headaches and crises, however, as in most construction enterprises, that kept me nervous for half a year. Marcia and Kenneth were observers of the final settlement at the end of January, 1970. At the dining table at the new house on Lot 32 of Melton Ranch I were the contractor and his accountant, the plumbing and electrical subcontractor, the replacement electrical subcontractor, George and myself. The

contractor and first subcontractor were huge men. Every once in a while, they would both stand up for emphasis (one owed the other a large sum of money). The effect was daunting. I had to explain why we had shifted electrical subcontractors, which I could do with a list of how specifications were not met and how the major contractor had not checked at any stage. More standing up! I pacified the first subcontractor by praising the plumbing part of his work. George admonished all of them to stick to the monetary details of Dr. Leonard's house instead of including other jobs and other debts. To balance all of the charges and counter-charges, I would have to have paid \$6,000. I said that I would be willing to do this but I hoped that the contractor, as a Texas gentleman, would be willing to assume half of this because of his responsibility. My final check of \$3,000 guaranteed the signing of all the documents. Once the building tribe had left, my loving children asked me whether I had been afraid. I explained that George had calmed everyone and that I was only afraid we would miss our plane if they squabbled too long. The total cost was \$69,000. Marcia helped Nell decide on the furnishings, and the total cost of these was about \$15,000.

By summer, we were ready for our first renter, Lubert Stryer. Lubert, an M.D., had received a Ph.D. in Biochemistry at Harvard from Elkan Blout. We arranged a low rental price for Lubert and his family with the agreement that they would help with the landscaping and watering, which they did. They are avid tennis players and hikers. Their successful summer rental brought us into a friendship that we have happily maintained. Lubert, who is now a Professor in the Medical School at Stanford University, has written an all-time best-seller textbook of Biochemistry. When I asked him why he had taken time away from his research, consulting, and teaching to write a textbook, he answered that the idea came to him in the summer of 1970(!) when he decided that he would like to buy a house in Aspen/Snowmass and that a textbook could supply the income necessary. The Stryers did buy a house in Starwood Ranch, Aspen, in the 1990s, and we see them each summer. Our friends, Dan and Natalie Alpert, were our guests in January of 1971 and again in 1979 when they planned a house that they would build in Snowmass. In 17 of the 27 rental years, the income exceeded the cost of renting, which had been our minimal goal.

Of course, the Snowmass house has provided fabulous family vacations in all the years of our ownership. Other members of the extended family have been welcome, e.g., Nell's cousin Betty Vermey, Director of Admissions at Bryn Mawr, in January, 1979; Nell's second cousin Hans Mijndliëff and his wife Nicole in June, 1978; Nell's nephew Maarten Versteegh in July, 1970, and more members of her side of the family in

1983. In January, 1975, our first mini-reunion of Lehigh '37 classmates, Carl Becker and Joseph Walton, and their wives was so successful that it was repeated in 1976 and 1978 through 1981. In August, 1993, Marcia hosted a mini-reunion of her high school classmates. In January, 1978, Nell and I hosted a University of Illinois party for 19 people with Illinois connections who happened to be in Aspen/Snowmass at that time. The first among the children's friends came to visit in 1971 and 1972. We entertained friends from England: Michael and Jillie Parsons in March, 1981, and Leslie and Kitty Strang in the summers of 1977 and 1982. In the first year, they helped with thistle removal and we toured around Colorado; the second visit was cut short unfortunately when Leslie was diagnosed in Aspen as having a possible lung cancer, which turned out to be true when they returned home abruptly. Visitors came regularly to the Aspenyl Chemistry and Biochemistry Meetings, which were initiated in 1975 and which are described in another section. The first in-law parents, Bill and Edith Wilson, were with us in January, 1982, and Fiammetta Barchiesi was with us in January, 1986. March 20-April 3, 1991, marked the first visit of Peggy Phelps, which ended in near disaster when I crashed into her (coming up the slope in a fast turn at the bottom of Roche Run on Ajax as she was coming down), giving her a concussion, diagnosed the next evening. The collision, witnessed and *unappreciated* by other members of her family, caused a most anxious point in our relationship. It was through the attention and help of Ann Watson, our neighbor and friend, that Peggy was able to return home as soon as sufficient recovery allowed her to travel. Peggy's friend, Bobby Schwarzenbach, was introduced to the house in March, 1992, when he arranged for some necessary redecoration. Peggy and I did our first skiing together in Snowmass as a couple in March, 1993, and Peggy hosted her "Ladies' Ski Week" at the house in March of 1996 and 1997.

In terms of monetary value, the house and land, Lot 32, were appraised at \$320,000 at the time of Nell's death in January 1987. The real property was conveyed in 1992 to the Nelson J. Leonard Trust dated October 13, 1992, Nelson J. Leonard, Trustee. In 1998, pursuant to transfer of ownership from the Trust to the four children, the property has been appraised at \$625,000. From the start of our involvement in Snowmass Village, Nell always had her eye on Lot 33, just below the house. She felt it should be in our hands, primarily, in order to guarantee the view to the east and secondarily, as a safe place for recreation, i.e., sledding and "disking." At the inauguration of the Snowmass-at-Aspen area, Lot 33 had been "sold" to a judge, one who ruled favorably on the development of the subdivision. He had used it as collateral in multiple financial

transactions, so read the Abstract of Title when we finally obtained possession, and the lot had indeed become encumbered by taxes and lawsuits. The lot finally reverted to the Snowmass-at-Aspen Joint Venture (or its successor) and Nell was right there to say that she would take it off their hands. It was a done deal for \$15,000 cash on September 17, 1973. It was our joint wish to transfer the property to the children as a guarantee for the future. If another Leonard house were to be built, that was the land upon which it could be placed, with a shared drive entrance. The lot would appreciate in value, and, if all four ever agreed to a necessary sale of the lot, any construction on the lot would have to meet with their approval and also approval of the Melton Ranch I Homeowners Association. In other words, the four owners could preserve the view to some extent.

After Nell's death, the intended transfer was initiated by me in 1989 and continued until 1993. The official appraisals ran as follows: 1989, \$160,000; 1990, \$178,000; 1991, \$180,000; 1992, \$180,000; 1993, \$195,000. It took five years to transfer Lot 33 using the \$10,000 single tax-free upper limit. Moreover, we were exempted from any real estate transfer tax. The property tax valuation of the property (not equivalent to the appraisal figure) keeps going up and up, and we hope we have not saddled the children with too great an annual tax burden. It is my intention to continue to alleviate that expense within the tax-free gift limits available to Peggy and me.

## SINGING CAREER—1924-1955

“Nelson can't carry a tune.” So answered my mother when Maestro Edgar Fowlston asked her if I might be interested in joining the boys choir that he was organizing at Trinity Episcopal Church, Mount Vernon, New York. Mr. Fowlston was from Sheffield, England, and had come to Mount Vernon via an intermediate appointment at a church in Toronto, Canada. He was in the process of building up the finest choir of men and boys that Mount Vernon had ever heard. He had a tremendous knowledge of sacred music, an appreciation of the science of voice production, especially in adolescent boys, and an ability to control an obstreperous bunch of young singers. All of this was unknown to us at the time of his question to my mother (1924) but would become evident in due course. I was eight years old. Mr. Fowlston brushed aside my mother's response and assured her that he would have me singing solos in church by the age of 10. That is what actually transpired, although I had to share the role at first on a rotatory basis with two of his sons, Charles and Dalton, who were also boy sopranos. The established soprano soloist when I first joined the choir was John Gaunt, who had a remarkable high range and great projection, but successors had to be trained to replace him when his voice would change. I became soprano soloist in 1928.

The rehearsals for the boys were held at 4:00 p.m. on Mondays and Wednesdays and for the full choir on Friday nights. This routine became part of my life. We were paid a small sum each week, but this amount was subject to subtraction for absence, lateness, or disruptive behavior. At each rehearsal, we would receive training in voice production, sight reading, and, of course, staying on pitch. I thrived on the learning of new music, the comradeship, and the competition. Mr. Fowlston also generously gave us group singing lessons and, as we developed, individual singing lessons. His wife, Gladys Fowlston, was occasionally our accompanist during those lessons in which we studied secular as well as sacred music. I began to accumulate a library of sheet music and cantata and oratorio music. I could practice regularly at home, where my mother was my competent accompanist—as long as the piece did not contain too many sharps! It was a little different at school. My homeroom teachers

complained that I sang too loud when there was group singing. My enthusiastic participation was therefore funneled into glee club concerts and, from those, into operetta productions.

My mother and I played and sang for my father and any guests after we had mastered several musical selections that seemed to fit together. We performed for the family, including my grandmother, uncles, aunts, and guests at Thanksgiving and Christmas. If not a command, at least it was an expected performance, and it was good experience for appearance before larger audiences. My mother taught me a valuable principle. It was to sing my very best no matter the size of the audience or the place of performance. "Always give it your very best," and "Sing as though you are on the stage of Carnegie Hall." It is indeed important to strive for a professional level on all occasions; then, there is no confusion as to what a singer is trying to project and there is a repeatable basis for self-satisfaction.

By 1929, when I was 12 and the economy was overheating, I was able to obtain some solo engagements in other churches, even some in New Jersey, including the church in which my parents were married. The guest appearances were tolerated by Mr. Fowlston as long as the program indicated that I was trained by him and as long as I could be absent on a particular Sunday (two services) from Trinity Church. The most I ever earned on a Sunday away was \$12.50, but that was a worthwhile sum in 1929. After the market crash in October of that year, however, the guest appearances ceased. What I earned as a choir boy in Trinity I put into savings (one-half) and back into music (one-half) in some form.

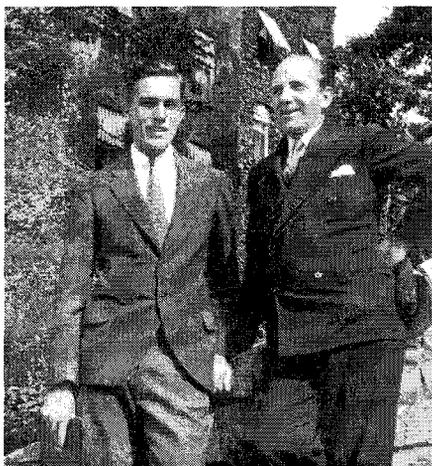
In 1930, two events changed the course of my choir career. At 13, about to be 14, I had earned my place as the number one soprano soloist, when Mr. Fowlston imported a younger boy into the choir. Michael Rotando had a natural, rich, high soprano voice. It was a more romantic and appealing voice than the rather straight, Anglo voice that had resulted from my background and training. What a blow, just when I had achieved a dominant position! Mr. Fowlston sensed my discontent and offered a solution. He said that in his experience, when the voice of a boy soprano "breaks," it is problematic whether he can be a fine singer thereafter. He would like to try the experiment of training my voice downward in pitch to an alto range. This, he felt, would avoid the usual "break," and further maturation and training could bring the range further down to tenor, baritone, or bass, according to where it would eventually settle. I trusted his judgment and happily, although not at first, became his alto soloist for all of my high school years, that is, 1930-1933. Michael and I sang well together. I came to appreciate his natural musicianship, and we enjoyed

each other's company. We had many singing engagements during the three-year period in addition to the usual solos and duets in church.

The other remarkable event of 1930 was a change of church. Mr. Fowlston was offered the choir directorship of the Chester Hill Methodist Episcopal Church, Mount Vernon, which had no choir before that. He was given carte blanche to recruit, and he recruited about half of Trinity's members, Michael and me among them, at a raise in pay. This sounds sort of crass, but a new Rector had come to Trinity, and the relationship between priest and choir had lost some of its common purpose. The people of the Chester Hill church welcomed us with great enthusiasm, and we enjoyed singing in the more visible and responsive surroundings. That is, there was no chancel as such, so we performed facing the congregation. As choir boys, we could not help but notice that the girls in the congregation were prettier in the new church. We had the opportunity of meeting them at the Young People's Fellowship which met on Sunday evenings, and we occasionally went on ice skating parties. My most important new friend at Chester Hill was Morton Sultzter, who was to play an important role in the life of the Leonard family and in my scholastic career. The rehearsal times for the boys and for the full choir remained the same. Whereas Trinity Church was next door, the Chester Hill Church was a mile away. It wasn't so inconvenient, however, because it was fairly close to the Mount Vernon High School and I could walk there easily at the end of my final study period of the day. A pair of buses would cover the distances when the weather was foul. The change was good for me, although it did alter my parents' Sunday habits, as I described in the chapter devoted to them.

During the summer of 1933, before I attended Lehigh University, I took voice lessons with Mr. Fowlston, for which I had to pay out of savings, as he guided my voice range downward in the tenor clef. At Lehigh, I sang first tenor in the glee club while still singing alto in the choir of the Pro Cathedral Church of the Nativity in Bethlehem, Pennsylvania. T. Edgar Shields was the director of the glee club and organist and choirmaster at the church. He was aware of my abilities and my limitations; thus, I had the best possible musical experience. Finally, in the summer following my sophomore year, my voice had finally settled into the baritone range without a break, just as Fowlston had predicted five years earlier. During my last two years at Lehigh, I sang first bass in both the glee club and church choir and had some solo occasions. Original musicals that our acting club, Mustard and Cheese, presented in 1936 and 1937 were great fun. I sang a role in each of these, but the main lead went to a tenor each time. Female players and singers were imported from the local women's colleges. The director was Al Rights, who demanded and got the best out of us. We

would do anything for him. My classmate Harold Towne organized a double quartet. We sang at alumni gatherings in Philadelphia, Baltimore, and New York, and over the radio in those cities where our studio time was paid for by local alumni.



NJL with Edgar Fowlston, voice coach

I was back with Edgar Fowlston as a teacher in the summer of 1937. Since I was working that summer at Bell Research Laboratories in New York, I could afford to pay for one lesson a week—on range, color, projection, and repertoire. I felt fairly well prepared musically when I went off to Oxford that fall. Music in Oxford has been covered systematically in the chapter on *The Oxford Years, 1937-1939*. Upon my return, I visited Fowlston again, who had progressed to having a studio in the upper reaches of Carnegie Hall. However, I felt that he had provided me with about everything he knew and I therefore

postponed further voice lessons. In the meantime, his wife Gladys Fowlston acted as a volunteer agent for me and secured an audition with Harold Friedel, organist and choirmaster at Calvary Episcopal Church on Fourth Avenue (now called South Park Avenue), New York City. Luckily, I was hired as a paid choir member and had three years of excellent musical experience. The bass-baritone soloist was so good that I only got to sing solos when he was absent or when, in Sunday evening cantatas and oratorios that we presented, two bass solo voices were needed. Friedel was a composer of religious music that is still performed. He was also a terrific organist. It became my habit, following his initial request, to turn pages for him when he played the postlude in Sunday services. Through that contact I heard a fair amount of the organ literature. I also seemed to have become well acquainted with his technique. Here is the story. After 1942, I did not visit Calvary Church nor did I hear from him again. However, in the spring of 1947, when I was showing Nell around New York, we stopped in to see the interior of beautiful St. Bartholomew's Church on Park Avenue (the real Park Avenue). The organ was being played with great spirit. As I listened, I blurted out, "That has got to be Harold Friedel!" Indeed it was. He had moved uptown to one of the best jobs in New York City. Unfortunately, it was not to last very long.

He had a heart attack while shoveling snow after a blizzard only a few years later.

Every singer needs a vocal teacher. It is never safe to rely upon one's past training and current habits. Each teacher can bring about an improvement. I found a new teacher in Hunter Kimball, an established voice teacher with a studio on East 72<sup>nd</sup> Street, located conveniently near a subway stop. After I had worked with him for a few weeks, I took along to the next lesson one of the Calvary choir members so that she could give me her judgment as to whether Kimball was the right teacher for me. Her answer was positive, and I stayed with him for almost three years. As I think back on the experience now, I believe he helped me most with good projection at the piano or pianissimo level and a bit rounder tone. I couldn't afford, however, the frequency of lessons that he preferred. Where did I practice? When I went home to Mount Vernon on certain weekends, quietly in my room in John Jay Hall, in the laboratory if I was the first arrival, and out of the open door at the rear of any subway train that I rode. That would not be possible today because standing on the rear platform would be considered unsafe. I could always "read" the music even when I couldn't sing out. Music kept me on an even plane during the bumpy course of graduate research for the Ph.D.

It was when I went to the University of Illinois in Urbana-Champaign that musical opportunities really developed. I started singing in the University Choir and taking voice lessons with Bruce Foote. Russell Miles was the director of the U. of I. Choir and a professor of organ. When I took a Sunday off from research, I would take a long walk and also listen to one of his regular organ recitals. There was not very much else to do in the center of Illinois. By the spring of my first year at Illinois, 1942-1943, my singing was known well enough that Professor Miles asked me to appear with him in one of his organ recitals. I sang two of the "Four Serious Songs" of Brahms, accompanied on the piano by Grace Wilson. At that time, Grace was an assistant professor of voice and was also generous with her time as an accompanist. Bruce Foote was a competent and amusing voice teacher, but he was better known for his professional singing. I substituted for him as a paid soloist in June of 1943 when the First Presbyterian Church of Springfield, Illinois—Abraham Lincoln's church—presented the Brahms' "Requiem." I was surprised that the *Illinois State Journal and Record* covered the church performance including,

"Nelson Leonard, University of Illinois, contributed tones of resonance and warmth to the baritone solo lines."

Bruce Foote was not only generous in suggesting my substitution for him, but he must have coached me well because, from that time forward, I became the invited bass-baritone soloist at First Presbyterian's special evensongs. Harry J. Tomlinson, Jr., who was the organist and choirmaster, became a good friend. I enjoyed singing under his direction a wide variety of cantatas and oratorios, including Haydn's "Creation," Handel's "Messiah," Bach's "St. Matthew Passion," Mendelssohn's "Elijah," and Bach's "Mass in B Minor." In the 1940s, it was easy to travel between Urbana and Springfield by an interurban railway ("light rail") and the Tomlinsons would put me up after the rehearsal on the Saturday night before each concert. I also sang solos for Lanson Demming, who was the organist and choirmaster of the University Place Christian Church in Campaign.

By 1945, I was ready for recitals; one of duets and solos at the University of Illinois with Grace Wilson, with Professor Jane Watt as the accompanist, and another at the Illinois Wesleyan Junior College of Music in Springfield, with Harry Tomlinson as accompanist and co-recitalist. We had a small but loyal following in both Champaign and Springfield. When Bruce Foote went on leave to sing professionally, Professor LeRoy Hamp became my singing teacher for the next 10 years. He was an excellent and demanding teacher, with constructive ideas about how I might advance my singing career. One of his ideas was that I should audition for Edgar Nelson, Director of the Apollo Musical Club. Located in Chicago, the Club was the oldest choral organization in the Midwest and certainly the best in those years. The designated audition day was not without difficulties. On the ride to Chicago on the Illinois Central Railroad in an old coach, I managed to transfer some oily material to my light tan gaberdine suit. What to do? I bought a small bottle of cleaning fluid and retreated to one of the lakeside parks. Several applications of fluid with a small towel, also purchased, did a fair job, and my sitting patiently in the sun allowed the residual liquid to evaporate after each application. After a time, I was sufficiently dry-cleaned, although not pressed! A walk in the park and a brief visit to the Chicago Art Institute restored my pleasant anticipation of the forthcoming audition. When I appeared before Edgar Nelson and his committee, I didn't feel nervous but I felt eager. However, my knees were shaking. It was lucky that the pant legs were wide, which was the style in 1944, so that the shaking was not visible to the listeners. I sang one of the bass solos from Bach's "Mass in B Minor" with some passion, reminding myself of Hamp's advice, "When you sing this, remember that Bach had 22 children." The audition was successful, and Edgar Nelson was almost apologetic that I would be hired to sing Satan in César Franck's

“The Beatitudes,” promising that the Club would be expecting me to participate in a Bach program the following year.

LeRoy Hamp obtained a very important job for me in September, 1945. It was to sing in the main Rosh Hashanah service of the Washington Boulevard Reformed Synagogue in Chicago. LeRoy, who was to play the organ for that service, taught me the major Hebrew selections that I would be required to sing, and I was coached further by a professional cantor from Vienna (originally) who was to sing the holiday service in Rockefeller Chapel of the University of Chicago. We added a selection from Elijah as a voluntary: “Lord God of Abraham.” After the service, the rabbi took me by the shoulders and said, with enthusiasm, “You are more Jewish than we are!” It was probably the finest compliment on my singing that I had ever received. He had tears in his eyes, and I had tears in mine. During 1945 especially, we had been learning the full extent of the persecution and slaughter of the Jews by the Nazis. Later that September, I started my service with Field Intelligence Agency Technical of the U.S. Army in Europe, returning in February, 1946, to continue with my chemistry and music.

The April 1946 dress rehearsal and performance of Franck’s “The Beatitudes” were exciting for me. The other soloists and the Chicago Symphony Orchestra responded well to the direction of Edgar Nelson, but the composition is a bit dated. Two things happened to me as the result of my appearance and Albert Goldberg’s review in *The Chicago Tribune*, which concluded with:

“A young bass, Nelson Leonard, put vim and vigor behind a promising voice but directed his performance entirely to his tightly clutched music book.”

Wow! My only explanation was that Mr. Goldberg, as critic, had been sitting in the first or second row of the orchestra and thus effectively under my score, which I was holding straight out while I directed my voice to the first balcony (Orchestra Hall is a tall structure). The quote was valuable to me just as long as I ended it before “but.” The agent for the Chicago Symphony, Howard Will, who heard the concert, said he was willing to be *my* agent if I would learn my roles by heart or at least hold my score down in a more relaxed position. He did, in fact, obtain some good jobs for me and received 20% of each singing fee. And I followed his directive!

My singing activity picked up from the time of the Apollo Musical Club appearance. Harry Tomlinson, who had changed his position to the

Normal Park Presbyterian Church in Chicago, enlisted me to join him for an organ and solo recital in May, 1946, and to be soloist in their production of "Elijah" on October 6. Arriving in time for the rehearsal the day before was a bit hectic. I had spent a consulting day at Phillips Petroleum Company in Bartlesville, Oklahoma; my commercial flight from Tulsa to St. Louis was on time, but a sudden airline strike grounded me there. I wandered over to the private aircraft section of the terminal and found a pilot who was going to Chicago. He was more interested in recruiting young female passengers, but I talked him into allowing me to ride in the fourth seat. I was proud of my ingenuity in reaching Midway Airport in good time for the Saturday rehearsal, but the other musicians took it as a matter of course that we would all be assembled at the assigned hour. It is a "given" that if you arrive somewhere on time, or perhaps even late, your friends who meet you there are not so interested in the details of your travel.

My next "Elijah" was sung in Midland, Michigan, with Theodore Vosburgh conducting the Midland Choral Society, Dow Mixed Chorus, and the Dow Symphony Orchestra in two performances in December, 1946. John Toms was the tenor soloist. Some 20 years later, there was an Ann Toms in my class in organic chemistry at the University of Illinois. The name was unusual enough that I asked whether the singer was her father. Indeed, he was. Marjorie Johnson, writing broadly enthusiastically in the *Midland Daily News*, gave me a very useful quote:

"In the singing of Nelson Leonard, who represented the character of 'Elijah,' the audience heard a dramatic bass baritone whose tone and clear enunciation highlighted the performance. Leonard brought exceptional feeling to the quiet and dramatic 'It Is Enough'."

In January, 1947, I sang a second recital at the University of Illinois with Grace Wilson, with Jane Watt as accompanist. These recitals evolved into annual events, so that we covered a wide range of music and were well supported by the students and staff of the Music School, along with some loyal chemists and physicists. Nell was scheduled to arrive in New York on February 11, and I asked permission from Roger Adams, Head of our Department of Chemistry and Chemical Engineering, to be away from the U. of I. He agreed that I *had* to meet her since she was my fiancée and was coming to the U.S.A. for the first time. When he learned that I had substitute lecturers in place for my intended absence, he gave his permission. As I was going out the door of his office, quite satisfied, Dr. Adams called me back. As Chairman of the Program Committee of the

Urbana Rotary Club, he wondered whether I would be available in March to sing at one of their luncheons. You can bet that I made myself available. Unfortunately, Adams was out of town on the occasion.

When I was asked to perform in the First Bach Festival in Kalamazoo, Michigan, February 27—March 5, 1947, I indicated that I would like to bring along my fiancée, newly arrived from the Netherlands, as a guest. Kalamazoo is in the heart of the Michigan area where immigrants from Holland had first settled. Nell was welcomed with open arms and was kept so busy being entertained that I saw very little of her in Kalamazoo. I stayed with the Davis family and she stayed with the Meyer family. They were enthusiastic supporters of the festival. The contralto soloist was Lilian Knowles, wife of the conductor of the famous Bethlehem Bach Choir. She assailed me when we appeared for the first rehearsal, “When did you sing with the Bethlehem Bach Choir?” Those, indeed, were the words that had wandered through the newspapers, from an earlier entry, which described Nelson Leonard as a soloist who was to appear in the concert. I had paid no attention to any advance notices. The original wording that I had provided somewhere along the line, “(NL) has sung with T. Edgar Shields, Organist of the Bethlehem Bach Choir,” was apparently too obtuse to have been used. It was also factual but potentially misleading. After I had gotten over the mini-trauma of the confrontation, we proceeded with rehearsals. Harold Haugh, from the University of Michigan School of Music, who was the solo tenor, was a great musician with an impressive voice. I was to become a co-soloist again with Harold and Lilian, and she changed from “critic” to “fan.” Beth Sebalý of the *Kalamazoo Gazette*, in describing Bach’s “The Passion According to St. Matthew” as performed in the chapel of Kalamazoo College, wrote:

“Singing the words of Judas, Peter, Caiaphas, and Pilate was the demanding responsibility of Dr. Nelson Leonard, bass baritone. His sensitive interpretation of the many roles is the obvious result of successful experience in singing the ‘Passion’.”

Henry Overley, who was the Director of the Bach Festival, wrote me a very appreciative letter after he had listened to a recording of the performance and had tabulated the results of the questionnaire he had sent out to chorus members and patrons. I appeared again under Henry Overley’s direction in the Second and Fourth Annual Kalamazoo Bach Festivals. In their second “St. Matthew Passion,” I sang the role of Christ, chronicled in the *Kalamazoo Gazette* of March 16, 1948:

“Nelson Leonard’s mellow tones and absorbed, devout attitude towards his part were notable in interpreting the words of Christ.”

The program of the Fourth Festival included Bach’s “B Minor Mass.”

Back in the spring of 1947, Nell heard me sing in the University of Illinois performance of the “St. Matthew Passion,” in which my voice teachers LeRoy Hamp and Bruce Foote were co-soloists. Nell and I were together for the 75<sup>th</sup> anniversary performance of the Apollo Musical Club in Orchestra Hall, Chicago, where I sang the bass solos in the “B Minor Mass.” The date, May 8, 1947, made our lives a bit hectic. We flew out of Chicago after the performance on a midnight plane that made two stops on its way to New York, and we were married in Bronxville on the morning of May 10. An overnight train brought us back to Urbana-Champaign in time for a party at the home of Roger and Lucile Adams on May 11 and a return to teaching for me on May 12. The next “B Minor Mass” was sung in Milwaukee, Wisconsin, in 1948 with the Arion Musical Club under the direction of Hermann Nott, with good response from R.L.F. in the *Milwaukee Sentinel*:

“A good sized audience listened with respect for sincerity of both the chorus and the soloists, among whom Nelson Leonard, bass of Urbana, Ill., was outstanding.

“Leonard’s voice has both depth and fervor. He was particularly effective in the air, ‘For ‘Thou Only Art Holy.’ His voice has an heroic quality.”

Perhaps I was reflecting exuberance at the imminent birth of the first member of the family. Kenneth was born just 11 days after that performance. I enjoyed filling the Milwaukee Auditorium (or at least half of it, because it was shortened in length by a huge hanging curtain) with my voice. William Miller, who was the tenor soloist, would be joining the voice faculty of the University of Illinois, and I could attest to his high quality as a singer and sympathetic artist.

There were other performances of the “St. Matthew Passion” in Severance Hall, Cleveland, Ohio, under the direction of Walter Blodgett, Curator of Musical Arts of the Cleveland Museum of Art; at Miami University, Oxford, Ohio, under the direction of Leigh Gerdine; in Orchestra Hall with the Apollo Musical Club and the Chicago Symphony Orchestra under the direction of Henry Veld; and at Drake University,

Des Moines, Iowa, under the direction of Stanford Hulshizer. The press notices were very satisfying. The performance with my friend Leigh Gardine generated a letter from Gordon Sutherland, Dean of the School of Fine Arts of Miami University, that I am not too embarrassed to quote in part:

*“Last year I was grateful to you for your performance in the Brahms Requiem. This year I am even deeper in your debt for your Christus in the St. Matthew Passion. The debt is personal as well as official, since this was by all odds the most superb performance of the part that it has ever been my privilege to hear. You made it what it should be—both an aesthetic and a spiritual experience of the highest order.”*

I treasured his letter (April 17, 1950) because he was not only a Dean; he happened to be an authority on Bach. In Des Moines, I was surprised to learn at the dress rehearsal that I was expected to sing all of the music designated for bass: arias, the role of Christ, and the brief parts of minor characters as well. I said to myself, “Oh, well, I’ll simply have to alter the tone a bit for the different voices and would face in a different direction.” That was sort of a challenge. The *Des Moines Register* covered “the first time that an important Bach work has been presented here” in an editorial (May 4, 1948) that included:

“Much of the inspiration of the evening came from the superb performance of the guest artist, Dr. Nelson Leonard of the University of Illinois, who sang the role of Jesus. His splendid voice, all-around musicianship, and complete understanding of the Passion music created the proper atmosphere for the oratorio.”

Bruce Foote and I sang in Bach’s “St. John’s Passion” with the St. Louis Bach Festival Chorus and Orchestra under William Heyne in May of 1949. *The St. Louis Post-Dispatch* was complimentary but got the two of us mixed up; however, *The Globe Democrat* had us properly sorted out:

“Nelson Leonard, a Christus whose clear and resonant voice projected a reverent dignity in that sacred role.”

Katherine Bender of the Bach Festival Committee sent me a postcard (May 14, 1949), which I kept, saying:

*"Last Saturday at the Board meeting, we all discussed you again and agreed on the beautiful quality of the work you did for us. On the recordings, as in performance, it is super!"*

Lest you wonder whether I am not being carried away by my great (past) opinion of myself during those singing years, let me assure you that I am not. The quotations are all part of the profession, expected and useful. But they have to be good to help you obtain the next singing engagement. It is similar in baseball, where an umpire "is only as good as his last call."

What, no Handel's "Messiah"? Oh, yes, there was one in December, 1949, at Mississippi Southern College in Hattiesburg. This must have been a time of exultation because of the birth of Marcia in November. The statement in the Hattiesburg newspaper was most gracious and generous. I took it to be the result of Southern hospitality, but I did feel that it had been my best ever rendition of the bass recitatives and arias from that over-performed work. I turned down a later opportunity offered by my agent, Howard Will, to sing the "Messiah" in Cleveland. Was I becoming more sophisticated or was I just spoiled? I welcomed the opportunity of singing the bass role in the "Missa Solemnis" of Beethoven at the University of Illinois because I had never sung it before, but the most exciting opportunity came in singing the baritone solos in William Walton's "Belshazzar's Feast." There were three performances by the University of Illinois Choir with the Chicago Symphony Orchestra under the direction of Rafael Kubelik, the great conductor who came from

Czechoslovakia and eventually returned there: March 30, 1952, in Urbana-Champaign and April 3 and 4 in Orchestra Hall, Chicago. Nell heard the local performance; however, she was pregnant and could not journey to Chicago.

In "Belshazzar's Feast," the baritone has a musical "feast." In separate sections, he sings above the chorus, orchestra, and trumpet choir; then, in alternation with the chorus; and also, unaccompanied. In the longest unaccompanied section, the soloist describes the wonders of Babylon and all that it possesses. The rehearsals with the University Choir under the direction of Professor Paul Young were followed by the dress rehearsal with Kubelik in charge. After



NJL, publicity photo

I finished the unaccompanied baritone solo, “Babylon was a great city—,” Kubelik called a halt to the rehearsal and asked me what I was thinking when I sang the long list of wonders. Reproduction of the words here makes the story easier to appreciate:

“Babylon was a great city. Her merchandise was of gold and silver, of precious stones, of pearls, of fine linen, purple, silk, and scarlet, all manner vessels of ivory, all manner vessels of most precious wood, of brass, iron and marble, cinnamon, odours and ointments, of frankincense, wine and oil, fine flour, wheat and beasts, sheep, horses, chariots, slaves, and the souls of men.”

I replied that I started the list very slowly, to indicate what was considered important to the Babylonians, giving the audience time to listen and appreciate the carefully enunciated words. Then, I accelerated gradually and finished the phrasing rapidly with “and the souls of men”—almost a throw-away line. What did souls matter? Kubelik said something like the following: “Valid. An interesting interpretation. However, the audience may not see (hear?) it that way. You and I know that the souls of men are most important. Why not try it differently? Start with a faster listing of the merchandise and ritard gradually, slower and slower, with rests between, until you end most slowly—and sarcastically—with ‘—and the souls of men.’ Then the audience will appreciate the contrast.” I thought about it for a moment. The chorus and orchestra gave me an entry, and I did it in Kubelik’s way. I knew immediately that it had been much more effective. Kubelik winked at me and continued directly with the music in hand. All three performances were terrific. It was exhilarating, exciting, and, now, memorable to have sung under Rafael Kubelik’s direction. It was thrilling to hear the audience cheering after the second performance in Chicago. One year later, he directed a Chicago Symphony concert at the University of Illinois. I happened to be out of town, but Nell attended the concert and spoke to Kubelik afterward to congratulate him and to ask him whether he remembered the baritone, her husband, who had sung in “Belshazzar’s Feast.” She relayed his (approximate) answer, “Of course! I convinced that young man to sing the long unaccompanied passage my way. We had a great experience.” I believe he kissed her.

The newspapers covering the performances indicated that of course the maestro had been correct:

1. “Impact of Walton’s composition left the audience shaken and exhilarated. It was sung with fervor and

brilliance by the University Choristers, and was played by the Chicago Symphony Orchestra under the direction of Rafael Kubelik.

“NELSON LEONARD was in splendid voice as soloist in ‘Belshazzar’s Feast,’ showing up particularly well in a passage describing the fabled riches of Babylon from her precious jewels to ‘slaves, and the souls of men.’”

2. “William Walton’s ‘Belshazzar’s Feast’ received a rafter-ringing performance—The singers performed with precision and power. Leonard sang well and quite understandably—Kubelik, Leonard, and the others received an ovation.”
3. “Baritone Nelson Leonard, associate professor of chemistry, turned in a dramatic interpretation as soloist in the composition.”
4. “Soloist Nelson Leonard sang with excellent diction and resonance and coped successfully with most trying melodic intervals. Chorus was thoroughly prepared and sang with style and musical understanding.”
5. “Walton’s ‘Belshazzar’s Feast,’ a magnificent and heart-stirring version of the Biblical story, was made a wonderful vehicle of sound—mostly fortissimo sound—by the University Chorus and Kubelik’s orchestra with extra brass. The conductor deserves highest praise for the skill he disclosed in leading so large a group with such admirable results.”

There was an earlier recital that I had enjoyed almost as much as the Kubelik experience, probably because I sang with my old Lincoln College friend, Leigh Gerdine, who is an incomparable pianist and musician. Leigh had moved from Ohio to Missouri as Head of the Department of Music of Washington University in St. Louis, where we presented the sixth in a series of chamber music concerts, thereby fulfilling a promise we had made to ourselves a dozen years earlier. We practiced initially in Leigh’s small, temporary quarters and then in dress rehearsal, concert style, in a huge mansion belonging to potential donors to the Department of Music. On the night of the recital, February 6, 1951, there was a terrific blizzard. Only the performers, my coach LeRoy Hamp, and brave and venturesome subscribers attended. We behaved as though the chapel were full, but I

felt that I forced my voice somewhat in my eagerness to project. The St. Louis press was kind, however:

**Nelson Leonard Gives Skilled Voice Recital at W.U.**

A baritone with tones of unusual beauty in the higher and lower portions of its register was displayed last night when Nelson Leonard was presented in recital in Graham Chapel as the sixth in Washington University's season of eight chamber music offerings. It was the voice of a musician skilled and understanding, and it had the sustaining reinforcement of a subtle accompaniment by Leigh Gerding at the piano.

The program was unconventional. Music not fashion interested the singer. A Brahms group, in which the "O Tod wie bitter" with its contrasting moods of approaching death was outstanding in its beauty. Then a group of Spanish songs, from troubadours of the time of Columbus, fascinating in the rhythmic interplay between piano and voice. A group to remember among treasured musical experiences.

Following four of Darius Milhaud's arrangements of popular Hebraic chants, a "Berceuse" outstanding Milhaud's modernism was hidden beneath the significance in the sad traditions of a race.

To conclude, a Russian group, Moussorgsky's "To the Little Star" sung in compelling beauty, his "The Goat," and two songs, "The Captive" and "Death" by Gretchaninoff.

An unusual program, which delighted both from that fact and from its beauty.—B.

My swan song in oratorio work came in a final production of Brahms' "Requiem," the work that had started me on this road. The date was December 4, 1955; the place, Smith Recital Hall of the School of Music, University of Illinois; the group, The Oratorio Society under the direction of Paul Young. The conductor and at least two of my good friends in the audience that night told me that they had learned something from my performance. In fact, they had detected what only I thought I knew. In Section III of the "Requiem," the baritone starts off with "Lord, make me to know the measure of my days on earth—," a solo I have always

loved. On that particular December 4<sup>th</sup>, I did not give it all the fire and depth it deserves, and I was not satisfied with myself. In Part VI, the baritone has another chance in “Lo, I unfold unto you a mystery—.” I resolved to exonerate myself, and I gave it all the mysteriousness, followed by as much excitement, that Brahms could have tolerated. I had gone from weakness to strength, and some people had detected what had been going on inside me. A very interesting evening.

In late April of 1955, I had decided to give up professional singing. I had been elected to the National Academy of Sciences. Nell had received a collect telephone call to this effect from my boss, Carl Marvel, who was attending the Academy meeting in Washington, D.C. When I walked home for lunch, I was met by Kenneth, rushing out of the door of 606 West Indiana, and calling, “Mommy says something awfully good has happened to you!” I remember the scene so vividly. I decided that if my fellow scientists thought I was doing my chemistry sufficiently well to join them in that august body, then I should concentrate on chemistry. I had had my fling in music. Moreover, when I returned from one or two singing weekends away that same year, Nell had asked the children, “Aren’t you going to greet your father?” Their answer, “Oh, has he been away?” provided a lesson and a warning that I had to heed. The family joke, provided by Nell, was more along the lines of “When Nelson received more for a chemistry lecture than he did for a singing engagement, he chose chemistry.”

“How much do you receive when you do solo work?” was a question Martial Singher and Paul Ulanovsky had asked after I had auditioned with them in the early 50s. The famous opera star and accompanist were on campus for a week of performance and coaching. At the urging of LeRoy Hamp and Grace Wilson, I had sung a group of baritone solos for them. Their opinion was that I could have a successful career in singing. However, they indicated that I would also have to sing opera, because “there was no fee for singing between the one I then received and ten times that figure—unless I sang opera.” It was too late even to contemplate that change. Singers can also teach to provide a living (but not for six). Leigh Gerdine sent me a letter stating that they needed a professor of voice at Washington University. Would I be interested in applying? Pleasant amusement! I quit singing cold turkey in 1955. The soloist mentality prevented me from singing in any chorus or choir and being satisfied with just that. Did I have any regrets? No, I had my beautiful experiences to remember. I would miss my musical friends, but I would gain chemistry friends. I would spend more time at home. The house would be quieter, because I *did* sing very loudly when I was practicing at home. Nell would

be relieved by my presence during the hectic hour from 5:30 p.m. to supper time. I would listen to more music and appreciate the work of others. I knew what the standards should be. No regrets! The breathing exercises and the projection of the voice helped keep me in shape for lecturing in chemistry for 40 more years, and the stage experience made me comfortable in any situation. Nell said that she was never nervous when I appeared on the stage, whether for music or chemistry. Fortunately, she was in the audience for only three chemistry lectures during our time together. Her general comment about each, "Too long."

## Postscript

In February, 2002, the Chicago Symphony Orchestra published two CDs from their archives to celebrate Rafael Kubelik's conducting of 50 years earlier and to serve as a reward for a contribution (of \$65) to the Orchestra. By committee consultation, among the selections that they decided to include was "Belshazzar's Feast" of William Walton. The performers are listed, along with my photo taken at the time and the complete text of the oratorio. We distributed these CDs to family and to friends who might be interested in my brief musical "fame" of half a century earlier. The most enthusiastic response came in an e-mail from Professor E. J. Corey of Harvard University (Nobel Laureate, 1990), who had been a younger colleague of mine in chemistry at the University of Illinois in the 1950s. I quote:

*Dear Nelson:*

*It seems like magic. Here I sit at my office desk listening to your performance in Smith Hall 50 years ago that I remember so well. It still sounds as good as I remember it being, which was really excellent. The CD recording also sounds very fine on my office audio. Thanks so much for the incredible gift and a spectacular piece of our shared past. Claire and I will listen at home tonight together.*

*Just by chance WGBH, our local FM station, has been playing a lot of Walton recently (he was born 100 years ago, 1902), and last week played Belshazzar's Feast. Of course it reminded me of you, but I never dreamed that I would hear you sing it again. We both have a link of sorts with Walton, since he also received an honorary Doctorate from Oxford.*

*It is also nice to have the Kubelik Tribute. I remember going to hear him conduct the University of Illinois Symphony Orchestra in 1951 with great pieces by Janacek and Hindemith.*

*Please give my best regards to Peggy. With all good wishes.*

*Cordially,  
E J*

## Second Postscript

Shortly after the CD “From the Archives” was issued by the Chicago Symphony Orchestra, I received a package in the mail from an unknown donor; that is, unknown to me. It came from Brian Hill, Manager of Copyrights and Promotion of the Music Department, Oxford University Press in New York. The package contained a deluxe *conductor’s score* of Walton’s “Belshazzar’s Feast, a copy of “William Walton, ‘The Romantic Loner” by Humphrey Burton and Maureen Murray, and “Walton, A Celebration—2002,” which was a comprehensive guide to Walton at the centenary of his birth. I had to ask Mr. Hill why I had received such a generous and thoughtful gift, and had he been the gracious donor. Yes, indeed, he had, because I permitted the release of the 1952 recording to serve as a means of donating to the Symphony. Since Oxford Press owned the copyright to the work, they also permitted the release. Mr. Hill felt that these actions put us in the same category. I am sure Oxford Press was surrendering real money, which made their gift to me even more appreciated. You can be sure that I responded warmly to Brian Hill.

## SUMMER IN CANADA, 1950

In 1950, I was invited to spend three months of the summer at the Canadian National Research Council, Ottawa, Ontario, Canada, working in the laboratory of Dr. Léo Marion. I applied for and received a Special Fellowship from the Rockefeller Foundation for the period June 15-September 15, 1950, with a stipend of 175 Canadian dollars per month, plus a family allowance of 100 Canadian dollars per month. This enabled us to drive to Canada and to live in a rented house in the Sandy Hill section of Ottawa. That section of the city turned out to be more plebeian than the name suggested, but the house had the advantage of being convenient to stores and to the NRC on Sussex Drive, about one mile away. The house looked better after our three-month occupancy than before because of our efforts at gardening, grass cutting, and cleaning.

The two-story house had a back (originally servant) stairway as well as front stairs, and I recall that our son, Kenneth, aged two years, dispersed his energy by a seemingly continuous circulation of the two floors. Daughter Marcia, about eight months old, loved to be pushed about in her stroller, was very smiley, and was always enthusiastic in her greetings when I returned from work each day. The parks of Ottawa were at their most beautiful that summer, and the fountains attracted great splashing activity by all the children, including ours. Marcia developed an intestinal problem which we managed to correct in time, but not, however, by following the advice of the doctor who was called in to examine her. His recommended treatment was a small amount of brandy, a remedy he had no doubt been testing regularly on himself. Driving along the parkways was a pastime that delighted all of us, for we could stop and picnic or play at will. We could watch and compare cricket and baseball. Children were even allowed at the horse races. Nell and I were able to renew friendships. We were offered hospitality by Col. Ralph Hendershot, who had been commander of the Canadian forces that had liberated Nell's village in Holland in 1945; by Dr. Henderson of the NRC, who had given me a hitched ride from Hocchst to Minden when I was on my way to visit Nell in Holland for the second time and he was in the Canadian Army Intelligence; and by Dr. Léo Marion and his wife. She was an artist and a collector of art.

When my mother came by train to visit us from her sister's home in Detroit, Nell and I were able to travel to Montreal for our first weekend away from the children. We were unabashed sightseers, and we enjoyed the food for which Montreal is justly famous. The weekend was not as restful as it might have been, however. When we returned to our hotel from dinner and a French film, we prepared for bed. Nell was taking a shower. I suddenly heard the sounds of a fire, which were unmistakable to the chemist's trained ear, and when I raised the shade, I saw that great flames were penetrating the roof of the nightclub directly across the street. I lowered the shade. I suggested to Nell as calmly as I could that the evening was still young, why didn't she put her clothes on again, and why didn't we take a walk. Good sport that she was, she readily agreed. When she emerged from the bathroom, she wondered why there was such a rosy glow outside. It was probably then about 10 o'clock. I raised the shade dramatically so that she could appreciate the source of the glow and, incidentally, some of its warmth. "Oh, yes," she exclaimed, "I think we should take a walk!" Before we did that, we decided to assess the efficiency of the firemen, who had arrived with great clang and clamor and were hooking up hoses and dragging them up the ladders onto the adjacent roofs. It was with some reluctance that we abandoned our vantage position for observing their attempts at extinguishing the blaze, but we decided that part of the hotel might be in jeopardy. We took a long walk through Montreal and returned to the hotel between 1 and 2 a.m., by which time everything appeared under control, but the fire engines were still standing by. It was more restful back in Ottawa.

What about the chemistry? I did isolation, identification, and partial synthesis of lupin alkaloids in the company of very talented and compatible coworkers of Dr. Marion. Drs. Peter Meister from Switzerland and Bryce Douglas from Scotland became our special friends. Both of them, now retired, moved to the United States for positions in pharmaceutical research and administration. I complained now and then to my wife about my slow research progress, probably because I was doing all the work myself without the benefit of students. Accordingly, it must have come as a shock to her when she asked me much later whether I had any publications to show for my time at the CNRC and I replied that there were three. In that moment I lost the privilege of ever complaining about the lack or slowness of research progress. My favorite joint paper was one in which we assigned stereochemical structures of the members of the  $C_{15}$  family of lupin alkaloids. Stereochemistry was not Marion's forte, and he was relieved, I think, when the crystal structure determination of one of the members of the series fully confirmed the stereochemical structures that we had proposed that linked all members of the class of  $C_{15}$  lupin alkaloids.

## SABBATICAL LEAVE, HOLLAND AND SWITZERLAND, 1953

It had not been the habit of Illinois professors of chemistry to take sabbatical leaves, but Reynold C. (Bob) Fuson and I initiated the process during the academic year 1952-1953. He lectured in Italy, his favorite country in Europe, and he spent considerable time in Florence during the first semester. I received an invitation from the American-Swiss Foundation for Scientific Exchange, Inc., to give a series of lectures in Switzerland, so we sandwiched the Swiss trip between visits to the Netherlands. It was to be Nell's first return to her home country, now as a U.S. citizen and accompanied by three small U.S. citizens: Kenneth (5), Marcia (3) and James (1). We had just moved from 805 W. California to 606 W. Indiana in Urbana; accordingly, I recall the final weeks of the first semester, the move, and the trip to New York as being somewhat hectic. We flew nonstop from New York to Amsterdam on KLM, speeded by a strong west wind.

As we flew over the western coast of the Netherlands, with its estuaries, bays, and islands, we saw that a disaster had occurred. The strong northwest wind, combined with a very high tide, had created a flood condition. The Dutch called it "Het Ramp." Some 2000 people had been drowned, thousands of animals were lost, and all the towns and farms of the low-lying polders were inundated. The arrival was grim, and understandably so. The worst of the flooding had occurred during our innocent trans-Atlantic night flight. For our family, the expectation of a happy, enthusiastic homecoming was replaced with dazedness, which was also the initial mood of the country. Nell's mother met us—her youngest two grandchildren for the first time—and drove us to her house, #203 Noordereinde, in the small, almost linear town of 's Graveland, N.H., near Hilversum, where Nell had been brought up. The large house where the family had lived was now the town hall, but the huge garden and pond remained, along with #203, which had originally been an office for the family business.

Energy had to be conserved to deal with the disaster. Train and bus service was cut back, travel was curtailed, the use of electricity was limited. The Dutch people responded with the gathering of food and clothing, the

hosting of displaced families, and volunteer efforts of all kinds. My old friend, Piet Heertjes, for example, organized the students of the University of Delft to aid in the repair of the dikes that had not been completely destroyed. The Dutch Army was mobilized, and boats and trucks were commandeered. For the adults, the almost-blackouts in the evenings reminded them of wartime. For our children, who used those evenings for long sleeps anyway, we concentrated on the activities of the days, and luckily some of the days during those first three weeks of February were clear. Nell was thrilled to see that Ken and Marcia appreciated the garden which she had known so well, and there were favorite walks along the small canals and through the beech woods, all of which evoked a sense of remembering and belonging. Nell's mother, Mrs. Vermey, hired part-time help to look after James, who responded to the new environment, new formula, and new food, along with the doting ladies, with nothing but smiles from dawn until dark. He thrived. When it came time for Nell and me to go to Switzerland, Holland was at least in recovery and we knew that the children were in caring, family hands.

The day-long rail journey from Amsterdam to Zürich was interrupted at the Basel railroad station long enough for Professor and Mrs. Pl. A. Plattner to meet and treat us to a snack and a brandy as a welcome to Switzerland. The Plattners had spent a summer at the University of Illinois when he was a visiting professor and was teaching a graduate course on terpenes and azulenes. They were very special friends. The Basel railroad station was memorable to us because that was where Nell and I had come together in December of 1938 for a skiing holiday in Parpan and Lenzerheide. Her train from Holland and mine that had originated in England were joined in Basel, just according to schedule. Back to 1953: we climbed back into our rail car to complete the journey to Zürich and the first night in a hotel near the Lake of Zürich.

It was a very exciting time for us. During our three weeks in Switzerland, we made new friends and saw new sights. A good balance was struck between chemistry and sport, between concentration and relaxation, between cities and lakes and mountains. I lectured at the Eidgenössische Technische Hochschule, the University of Zürich, the University of Basel, and the University of Bern. I also gave lectures before the Chemical Societies of those cities. I had prepared four different topics, only one of which did not come up to the quality of the other three. There was an appreciative response, especially to the three lectures I presented with slides. I also visited the Kocher Institute and the laboratories of Ciba, Hoffmann-LaRoche and Sandoz. At each stop, we were received with warm hospitality, and Nell was treated to visits to the homes and sightseeing

and shopping expeditions. We met some of the great chemists who were world leaders at the halfway point of the 20th century, including L. Ruzicka, T. Reichstein, P. Karrer, A. Stoll, and V. Prelog. I was impressed by the younger chemists: Hans Schmid at the University of Zürich and Cyril Grob at the University of Basel, with whom we became good friends. We were introduced to the pleasure and amusement of the Fastnacht festivities in Basel as guests of Dr. and Mrs. Scholz and Dr. Hofmann. We had a most pleasurable, long weekend of skiing in Lenzerheide with Professor and Mrs. Prelog and another skiing weekend, a bit scarier, at the Kleine Scheidegg, as guests of Professor and Mrs. Plattner. The Plattners skied the glacier while we skied the piste. The location of the Kleine Scheidegg just under the 4000 foot north face of the Eiger made my wife from the lowlands very, very quiet.

During our time in Switzerland, Nell was in regular contact with her mother as to the welfare of the children we had left under family care. All had been going well until our final week in Switzerland, by which time we learned that Ken and Marcia had developed colds and then sore throats, but were being treated with sulfa drugs or antibiotics that were supposed to solve the problem. We became anxious but we completed our final week in Lugano, keeping in touch daily. From Lugano we enjoyed tours on foot and by boat in this part of the Tessin, and we relaxed in the early spring that was coming to the Italian part of Switzerland. I started writing my report for Dr. Emil Schlittler of Ciba, U.S.A., who had arranged our trip, and to Dr. C. R. Scholz of Ciba, Basel, who had been our official host as President of the American-Swiss Foundation.

When we returned to Holland via Basel, after a goodbye stop with the Plattners, we learned that Ken and Marcia's fevers had abated but that the doctors were strongly recommending tonsillectomies. This was arranged to be done at the hospital in Hilversum. Although three years is an early age for a tonsillectomy (Marcia), we felt that the doctors were highly competent and convincing in their advice. Ken and Marcia occupied the same room during their recovery, and all the hospital staff, especially those who were competent in English, visited them frequently, as we did, of course. Marcia still remembers that her throat hurt and that she didn't want to drink anything. A recollection of the infant foods she liked caused me to try giving her canned pear juice. That was her first fluid intake, and it solved the incipient problem of dehydration. Full recovery of Ken and Marcia was rapid thereafter. A remarkable overtone occurred much, much later, in 1987, to be exact. I was in the Brigham and Women's Hospital in Boston following emergency surgery, called a modified Whipple procedure, for an adenocarcinoma blockage of the bile duct. I couldn't be induced to drink

any fluid. Marcia solved the problem by giving me canned pear juice, which lubricated the throat that had been irritated by an array of tubes. When the feeding tube was removed, Marcia advanced me to chilled lobster bisque. Who says that children don't remember what we do for them?

In April of 1953, we took Ken and Marcia on a tour of the Netherlands by car. The tour included the bulb fields, the cheese centers, the churches and old castles, the Afsluitdijk, and the provinces of Groningen and Drente, to which Nell had bicycled for food during the war. It was easy to reach Amsterdam and Hilversum by bus and train. There were numerous opportunities for the children to meet and play with their Dutch cousins in the families of Nell's two sisters, Els and Hilda. The weather was very kind to us during April into May. For the country, that meant the opportunity to pump some of the water away, to recover some of the low-lying polders, towns and fields, and to begin to plan for the massive sea dikes that were finally completed in the 1970s.

I was able to do some library work through the courtesy of Dr. M. G. J. Beets, the director of organic chemical research of Polak and Schwarz Essence Factories in Hilversum, a short bicycle ride from 's Graveland. They were large producers of high grade essences, perfume bases and flavors, 90% of which were for export, and had a good library of chemistry, especially organic chemistry journals. I was also able to visit the Shell Research Laboratories in Amsterdam, where Dr. E. C. Kooyman was my host, and to learn about their research in distillation methodology and electron diffraction. Philips, Roxane in nearby Weesp was undergoing expansion in the field of vitamins, steroids, and pharmaceuticals. They were very generous in telling me about their research, production and plans for the future. At the University of Amsterdam, Professor Wibaut had re-established his research, aided by Dr. Beyerman, while Dr. Sixma, as a lecturer, was introducing a modern approach in tracer studies of organic reaction mechanisms. The graduate students in organic chemistry at the University of Groningen, under Professor Backer, seemed to be exceptionally well trained. In 1972 I was to have the honor of being the Backer Lecturer at that institution. Organic chemistry was in disarray in 1953 at the University of Utrecht. My good friend, Pict Heertjes, was back at his post as Professor of Chemical Engineering at the University of Delft. He and his students had been assisting in the repair of the dikes in the earlier months of 1953, following the great flood. I was to see him again when he was a Visiting Professor at Purdue University and when we were again in Europe on sabbatical leave in 1960. Nell, the children, and I were back in Urbana, Illinois, during part of May and all of June.

At the end of June, we were on the road again, quite literally, driving to Los Angeles along old Route 66. The trip was not without adventure because of the heat. However, we discovered that if we started each day before dawn and stopped driving in mid-afternoon to cool off in a motel swimming pool, the journey became manageable and even pleasurable. As we drove further west, we resorted less to reading and games to keep the older two children occupied, and they began to appreciate the new and wonderful sights. We settled in a summer rental house in Santa Monica just a block or so from the beach. It became very comfortable once we had it fumigated to remove the hungry fleas that had been left by the animals of the owner. A supermarket was close at hand, actually a novel establishment for midwesterners in 1953. We connected with old high school friends of mine who had settled in southern California, and Nell made friends with neighbors who had small children. The large front yard was the children's playground.

Our purpose for being in California was for me to fill my role as a visiting professor at U.C.L.A. I taught a course in organic chemistry for undergraduate premedical students. They were mainly students from other universities who were trying to complete one of the required courses in a minimum amount of time. Pacing a course in organic chemistry for six-week coverage is difficult. There is so much material that cannot be digested upon immediate acquaintance. However, it was a good experience. I tried to maintain enthusiasm. The students simply wanted the course out of the way. Paul Bartlett of Harvard had been the visitor during the previous summer, and there was some pointed discussion about his high grades being C's. I managed a broader curve, but I felt that the student quality was below that at the University of Illinois. I was also in charge of the graduate seminar course, which meant inviting lecturers from U.C.L.A. and neighboring schools, as well as myself, to participate. Despite the excellent chemistry that was described, I felt the tug of the beach, the children, and the Pacific Ocean each afternoon, and I went home early whenever I could. My memories of the summer are mixed: university and beach. On the professional side, I benefitted greatly from regular lunches with Saul Winstein, William Young, Francis Blacet, and occasionally Donald Cram. U.C.L.A. was an active place intellectually. Hypotheses and experiments were examined critically, and recent publications were discussed hypercritically.

When it came time to leave Los Angeles at the end of the summer semester, we drove home by way of Las Vegas and the Hoover Dam, Zion and Bryce Canyon National Parks, the Colorado Rockies, and the Great Plains. The children's interest, patience and agreeableness were most gratifying. We celebrated son Jim's birthday en route.

## ILLINOIS YEARS—1953-1960

### Family

This period was bounded by two sabbatical leaves, the second of which was financed by a Guggenheim Foundation Fellowship. The University of Illinois permitted one-half year absence with full pay after six years of service if the sabbatical was officially approved. When we returned from sabbatical leave in 1953, we recognized certain deficiencies in the house that we had bought that February. As soon as possible, we made alterations to provide adequate play space in the basement and in the back yard, as described in the chapter “Where Did We Live?” There was extensive narcissus- and tulip-bulb planting around the redbud tree and in front of the hedges in the front yard. In fact, bulb planting became an annual ritual as long as we lived in the house. Ken and Marcia had separate rooms on the second floor, and James, while still in the crib, slept in the large closet with a window. He was eventually displaced by David in 1954 and graduated to a single bed in Kenneth’s room.

### David Anthony

Nell’s pregnancy with David was the easiest one of the four. However, she altered her original notion of having six children and agreed that four would be a fine and sufficient number. His birth on the beautiful sunny morning of June 7, 1954, almost occurred in the car. Leaving Mrs. Rhea Mall in charge of the three, we drove off to the hospital in the Pontiac convertible with the top down. So “holiday” was our mood that I felt in spirit that we were on our way to Michigan, and I drove two blocks past Mercy Hospital before being alerted by a cheery “Where do you think you are going?” We turned back to the hospital, arriving barely in time for the appearance of David. Although all of the others had also been born in Mercy Hospital, Urbana, they had appeared on the 15th of a month, Kenneth in April, Marcia in November, and James in August. It became a

teasing point when they later wanted to pester David with the notion that he was possibly adopted rather than being a regular member of the family. We convinced him, I think, to counter that he was just very special, when he was able to talk back to them. More serious was the fact that David was not released from the hospital until the measles and mumps had run their course through his siblings. Nell went back and forth between hospital and home all the time. The house was well prepared for David when he did come home, and he was welcomed warmly by five pairs of arms, contesting as to who could hug him more. He never seemed to cry. He smiled and stretched a lot, an early gymnast, and he was capable of intense concentration. David was named after David Harris, my best friend in England, and the name Anthony honored two other English friends with surnames Hugill and Parsons (the brother of Rodney). We made the family trip, grandmother Leonard included, to Dunewood when David was six weeks old.

Jim could not go into the water that summer because of a heel that was recovering from a pressure sore. By way of explanation, Jim suffered dehydration as the result of an intestinal flu and required hospitalization and intravenous administration of fluid. His leg was immobilized by a board attached to the bottom of his foot. Unfortunately, the hospital nurse did not loosen the board occasionally, with the result that an open sore had developed by the time Jim had recovered from the flu. Healing from within was eventually induced by the incorporation of granulated sugar in the wound to assist in the aggregation of the cells. It worked, but slowly. I remember that Jim's foot was still bandaged to prevent infection at the beginning of September, 1954. Seated in a small rocking chair, the two-year old helped entertain—by smiling broadly and shaking hands—some professor attendees at the University of Illinois Chemistry Symposium to honor Roger Adams. We had invited a few of them to the house on the afternoon of September 4<sup>th</sup>, at the termination of the Symposium, and the best place to gather was the shaded, screened-in porch since the outdoor temperature had reached an Urbana-record 108° F. Two swiveling fans and various cool drinks persuaded us that it could not be really as hot as that. James, suitably unattired, presided over the lot like an appreciative host, pleased to receive attention but encouraging the guests to do the talking. He did point out the fans occasionally, "Fan," to the amusement and appreciation of all.

During the 50s, the children grew up in the safety and convenience of Urbana, Illinois. There were tricycles and skates and small bicycles in sequence. The park was nearby for swings and slides, and the backyard was a gathering place for romps and games. The neighborhood was full of children, so friendships developed easily and some have lasted into adult

life. The house was filled with children's books and with stuffed animals that seemed to participate in the daily life of the establishment. We sat down for meals together as much as possible, with David in a high chair next to Nell. Manners were learned, conversation was encouraged, but Dad ate slowly and liked to talk so much that the children frequently asked to leave the table before dessert. Maggie Lou Perry became part of the family when she started doing housework for us regularly. She played a significant role in David's childhood growth and development. Mrs. Mall continued to be a trustworthy and much loved babysitter. When Kenneth and Marcia had graduated to bicycles, they would ride them to Eleanor Blum's house on Saturday mornings, where her mother would supervise their television watching (we did not have a TV set but would rent one whenever a child was ill) and would read to them from classic children's books. Chip Frey, who was born about the same time as Ken, was Kenneth's best friend. Cycling between the Frey and Leonard houses became a standard operation by the time they were in the 5<sup>th</sup> and 6<sup>th</sup> grades. Little League attracted Ken, and, to some extent, his father. Ken studied piano for two years and flute for about one year. However, he admits that he never practiced enough and, thus, gave up on a musical avocation. He spent his spare time drawing. Marcia was an avid reader and a listener to her mother's reading, and she took ballet lessons. Jim and Dave were full of boisterous play. Ken started skiing in 1958 and Marcia, in 1959, both in Winter Park, Colorado.



Kenneth, Marcia, James, David, 1958

The general pattern for schooling was a cooperative nursery school, pre-kindergarten play school, Leal School, the Junior High School. Leal School was a short walk from the house, so that rides were necessary only in big rain or big snow. The Urbana public school system was excellent. Nell taught Sunday school in the Congregational Church, which was attended by all of the children in turn. She also became interested in the life of the church sufficiently to play an important role in its organization and governance. The highlights of the children's play were outdoor activities and the basement, complete with bins on rollers (that were filled with toys, animals, or small people), a small slide, and toy trains that were set

up for a month around Christmas. Most notably, there was a summer month in Dunewood each year from 1954 through 1959.

## Research

While we were away in 1953, one of my graduate students, Richard C. Fox, was working diligently and effectively at making a series of compounds with medium-to-large rings containing amine and carbonyl functions. Upon our return in September it became clear that our original purpose for making the series was not going to be realized. However, upon re-examination of the data that Dick had accumulated for the series, in particular the infrared spectra, that the nine- and eleven-membered rings were unusual. Their spectra provided evidence for the occurrence of transannular interaction, that is, across-the-ring interaction, between the tertiary amino group and the carbonyl group in these medium-ring compounds. I was lucky to have in the laboratory at the time two postdoctorates who held postwar fellowships provided by the United States Government, Michinori Ōki from Japan and Stefano Chiavarelli from Italy. We went to work immediately to provide evidence for the limitation of the occurrence of transannular nitrogen-carbonyl interaction by ring size, steric interference, environment, and electronic factors. It was a wonderfully exciting research time and very productive. We invited the collaboration of others. While we had at hand spectroscopic means of observation, namely infrared and ultraviolet absorption spectra, we relied upon the cooperation of Dr. Harold Boaz of Eli Lilly and Company for more detailed infrared spectral analysis and for conjugate acid-strength determination, Professor Max T. Rogers of Michigan State University for determination of the dipole moments of representative aminoketones in our series, Professor Carl Djerassi originally of Wayne State University for determination of optical rotatory dispersion of an optically active eight-membered-ring aminoketone wherein the chirality of the alpha-carbon on nitrogen exerts its influence on the opposite carbonyl group, and Professor Theodore L. Brown for the dipole moments of eight-membered-ring compounds involving sulfide or ether with ketone groups.

The other excitement of the productive period that extended from 1953 resulted from our ability to determine spectroscopically the location of double bonds that we could introduce into saturated tertiary amines, producing, for example, cyclic enamines. The thorough study was initiated by Virgil W. Gash and was extended to their salts by Alan S. Hay, who later moved to McGill University after an innovative career at the General

Electric Company in industrial polymer chemistry. It was the salts of enamines, so-called iminium salts, that opened up the next phase of our research, because of the versatility of their reactions that had not been recognized previously. They functioned as ionic equivalents of the carbonyl group and thus were capable of rapid action with nucleophilic reagents. The two areas of research that I have mentioned brought me a number of lecture invitations, and I had to limit my trips out of town for lectures and for consulting visits to Lilly and Monsanto to no more than two per month. During this period, 1953-1960, I served as a member of the Editorial Board and subsequently on the Advisory Board of *Organic Syntheses, Inc.*, also on the Executive Committee and subsequently on the Editorial Board of the *Journal of Organic Chemistry*. In 1954, I was asked to be Head of the Division of Organic Chemistry of the University of Illinois, with responsibility for course teaching assignments and organic faculty space and recruitment, but with no appreciable budget. The main function of the job as I saw it was to maintain the collegial climate among the faculty, which included older members who liked to be consulted individually and younger members who liked regular, open meetings. A real responsibility was to participate in the design of a new chemistry building. That process has several starts and stops until Analytical and Organic Chemistry finally moved into the new structure in 1966. More about that in the next chapter period when construction really went forward, with colleagues Herbert Laitinen, J.C. Martin, and myself participating in the design and following the construction of the building that was eventually dedicated as the Roger Adams Laboratory.

Service to organic chemistry, in the University of Illinois tradition, was initiated in the 1948-1953 period, continued in the 1953-1960 period, and carried on until 2001 to some degree. First, it was as an officer of the Division of Organic Chemistry, American Chemical Society (Secretary, 1949-1954; Chairman-Elect, 1955; Chairman 1956). Then, I was appointed a member of the Committee on Organic Chemistry, Division of Chemistry and Chemical Technology of the National Research Council, 1958-1959, and a member of the Advisory Panel for Chemistry of the National Science Foundation, 1958-1961, which is covered in the chapter on "Service on Granting Foundations and Agencies."

## SABBATICAL LEAVE, SWITZERLAND, 1960

Six years after my first sabbatical leave from the University of Illinois, I applied for a second sabbatical leave to take place during the spring semester of 1960 at full pay. I also applied for and received a Guggenheim Fellowship, which helped pay the travel expenses of the entire family. It was my intention to try to change research areas during a quiet reading period away from teaching and Departmental duties, specifically, to move away from straight organic chemistry toward biochemistry. The actual result was that I became a pioneer in the field of bioorganic chemistry. I have not attached a copy of the Sabbatical Leave Report that shows how successful professionally the absence from Illinois really was. Basel, Switzerland, was chosen as the locus because of invitations from delightful friends who lived and worked there, and also because of the concentration of chemical industry and the centrality of Basel for travel within Europe.

What about family accommodations? We learned to our distress that pleasant living quarters for a family of six within a walk or tram ride to the University of Basel, where I would have an office and use of the library, were out of the question—either unavailable or exorbitant in price. After surveying, with Professor Plattner and his secretary and with Professor Grob and his wife, all of the options, Nell and I made a compromise decision. She and I would rent a two-room flat in an apartment-hotel on the Steingraben in Basel, and the children would be lodged in Flims, above Chur in the Graubünden. Kenneth, who became twelve that spring, would attend the boys' school in Flims, Pro-gymnasium Witzig. Marcia, ten, would be allowed to attend the school because Dr. Witzig's daughter was about the same age and was in classes there, but she would board next door in the Kinderhaus Schlosser, where James, not yet eight, and David, not yet six, would be staying. James was to receive some instruction from the school books he had brought along. It all sounded good because of the change, challenge, immersion (to a point) in German, association with children of other cultures, fantastic scenery, and the opportunity of skiing during the season. We rationalized our decision because of these

considerations and possibly because Nell had endured (quite happily) numerous separations from her parents during her early years and because, as an only child, I was happiest when I was with other children in the absence of adults. That is the background for the Swiss living and schooling arrangements. Let us see what transpired.

The question of what to do about our much-loved dog, Taina, a Norwegian elkhound, was solved by the willingness of our good friends Harry and Mae Elizabeth Drickamer and their children to look after her. They had a fenced-in backyard where Taina, in true northern style, could spend most of her time, preferably sleeping or snuffling in the snow during the Illinois-predictable winter. Our house at 606 W. Indiana Avenue in Urbana would be rented to a visiting professor, his wife, and two children, who would be in residence for the spring semester. They were visiting from England. On the appointed day for our departure near the end of January, 1960, there was snow and ice on the ground, which a warming trend converted partially to a thick ground fog. I remember it well. We drove at a watchful, limited 50-miles-or-less per hour, and we were concerned—that is, mother, father, and James were concerned—that we would not make our intended goal that first day. We didn't, progressing through Indiana, where the fog finally lifted, and almost to the eastern border of Ohio, to stay in a not-so-elegant motel, where Nell experienced some food poisoning. We rose early on the second day, and, although disadvantaged by having only one healthy driver, we made it to Princeton, New Jersey, to stay with friends. We were not warned in time that the father in that family was suffering from a raging upper respiratory infection. Fortunately, I was the only one in our family who caught the disease, which was not manifested until we were safely in the Swiss mountains. Why do I describe all this? Simply to remind any reader that travel with a family in mid-winter has untold hazards. I am so naive that I am still surprised, although not as upset as I used to be, when the actuality of travel does not match the plans that I have carefully made.

On the third, and to-be-final day, we drove to Bronxville, N.Y., and visited briefly with my aunts, Flora and Kate. I parked the car in their empty garage, raising it on blocks so that the tires would not be distorted on long storage, and we took a large limousine to the airport for departure on Swissair to Zürich via Madrid, where we made an early morning stop. The overnight flight was long but smooth, and we all managed to sleep a fair amount. We had two ranks of three seats. Marcia and Jim spent a good bit of time lying on the floor rolled in blankets, a feat made possible because there were no ridges or bars under the seats as there are on contemporary large aircraft, and because the seat-belt sign remained turned

off. David was stretched out with his head on Nell's lap, and Ken and I sprawled on the seats of the second rank, keeping our feet off the two below. After breakfast and a brief walk around the Madrid international airport area, we completed the flight to Zürich, flying close to the mighty Jungfrau and over our favorite Swiss lakes. Immigration formalities took a bit longer than usual because we were going to stay into June, but then we popped into taxis which took us to the Hotel Storchen, centrally situated and on the Limat. We roamed the parts of Zürich that Nell and I knew best, rested, and then came down for dinner in shifts. There was a parade of women that evening under torchlight. They were demanding the right to vote! In 1960! Our waiter made some disparaging remarks, and Nell proceeded to set him straight in her perfect German. In the second shift, Marcia came down to dinner, asked the waiter about the parade, and, although she was only 10 years old, proceeded to set the male chauvinist straight in her perfect English. Like mother, like daughter. I loved it! I must add, however, that we did not receive very good service from that waiter after those exchanges. As a footnote, Canton Zürich women did obtain the right to vote; in fact, all of the Swiss Cantons except Appenzell had given women equal voting rights by the end of 1960.

We saw more of Zürich on the following day. Professor Duilio Arigoni of the famous E.T.H. in Zürich remembers guiding the children into the fabulous toy store, Franz Karl Weber, and Professor Hans Schmid (University of Zürich) and his wife, Käthe, came to visit us in the Storchen. They had met the children when they were summer visitors at the University of Illinois and thus were old friends. The train ride to Chur and bus ride up to Flims-Waldhaus were fascinating—and have continued to be fascinating for each one of us whenever they were repeated during periodic visits to Switzerland. We stayed in the wonderfully hospitable Hotel Segnes Post, which served excellent meals. Herr Kleinguti was still serving excellent meals in 1980 and 1982, when Nell and I had dinner there with the Brossis and several other chemists and their wives. In the best hotel manager manner, he said he remembered our family of six from two decades earlier. Did we behave so well? Or so badly? In retrospect, it was probably a mistake to accustom the children to excellent restaurant fare when they would be moving to Kinderhaus Schlosser and Progymnasium Witzig after a week. We were trying to give them a treat. They were enrolled in ski school, and all except David prospered. He thought it was “too slippery.” After I got over my cold and sore throat, I skied, but what I remember best was sledding with James. We rode the lift to the halfway point and then slid down the snow-covered walking paths for the longest ride I have ever had on a sled. And the fastest.

There were occasional abrupt turns at the confluence of two paths. These we never did learn to negotiate properly, and we excursionsed off into the drifts along the sides, to the tune of "Are you all right, Dad?" Nell spent time at the Kinderhaus and at Witzig's making arrangements for the inevitable separation. We liked Frau Schlosser and her two assistants, but we had little appreciation for her staff and their strict adherence to the "rules" that would cause the three younger children such distress. There were many tears when it came time to troop down the road to the lesser abodes. James staunchly said, however, something like: "I don't know what you are making a fuss about. We were told at the beginning what would happen after the week together in the Segnes Post." He was not being unfeeling. He just always planned ahead.

Nell and I went to Basel and set up residence in the Apartment-Hotel Steinengraben. The pension included some meals. Nell fixed lunches for us because there was time for me to walk to and from the University during the two-hour lunch time observed in that city. We also discovered nearby reasonable restaurants that had atmosphere. We had promised Frau Schlosser that we would not visit during the first four weeks, which was the average period necessary, according to her experience, for children to pass through the feeling of homesickness. We received a few desperate cards from the younger three, while Kenneth was enthusiastic, probably because of his moving into residence at the Progymnasium Witzig, with never a look behind at the Kinderhaus. The real burden was on Marcia, who, at a mere ten, had to be motherly for Jim and Dave. Since woe feeds upon woe in a small circle, their mutual distress was probably reinforcing. That will have to be their part of this story. The end result was certainly a bonding together of the children, the effect of which is evident in all of their interactions during later years. Nell and I felt deprived of their presence, apprehensive of their treatment, and I had recurring dreams that they were being fed only some kind of gruel. In the grayness and wetness of Basel, we satisfied our concern by hearing daily of either sun or snow "in den Bergen," the right ingredients in the right place—Flims.

Nell lasted the four weeks, fortified by official telephone conversations with Frau Schlosser, then she traveled to Flims for the weekend. I lasted six weeks, the time period to which I had disciplined myself for a no-travel, only-study concentration. After those six weeks, Nell and I went together to Flims and had a marvelous time. We treated our children to dinner back in the Segnes Post, they took us on the walks they had become accustomed to and liked, and we promised to fetch them at Easter time and take them on a trip to Holland, where they could for a week reacquaint themselves with all their Dutch relatives. I cannot remember how many

times Nell went back and forth between Basel and Flims, but her sister Els made one trip with her, and I joined her in another trip before the Easter vacation. It was apparent that not all of our gifts, i.e., of peanut butter and various goodies, reached or stayed with those living in Kinderhaus Schlosser. The staff seemed to take control of such items. I must say, however, that our four looked very healthy on each of my visits to Flims, so that I had fewer “grueling” dreams.



The four children, Flims, Switzerland, 1960

After the first six weeks in Basel, I also made myself available for lectures elsewhere, but I started in Switzerland (February-June). These are mentioned in the Sabbatical Leave Report, should anyone care to read about them. The sequence of academic and industrial lectures is not important, but Nell and I also visited the University of Strasbourg in France (March), where we were handsomely entertained by Professor Guy Ourisson. We took a flying trip to England in May, where I lectured at the University of London (Professor Derek Barton), Oxford (Professor Tim Jones, with whom we stayed), and Cambridge (Professor Alexander Todd—we stayed with Dr. and Mrs. Sykes). A comparison of the manner in which visits to these three universities were managed is of personal interest. At the University of London, I gave two lectures, there were questions, our hotel expenses were prepaid, and I received an honorarium. At the University of Oxford, I gave one lecture attended, among others, by two faculty members who were there in my time (a bit daunting), and I received an honorarium to cover expenses. At the University of Cambridge, I also gave one lecture, following which, as was the custom, there was silence until Lord Todd asked the first question or made a pronouncement. In my case, it was the latter, to the effect that I had made good progress in my work on transannular interactions and reactions. I took unspoken umbrage at this judgment since I started this phase of my research in 1953, had proven or shown everything I wanted to during seven years, and I was at the point of abandoning the subject. I should point out that the late Lord Todd was about 6'8" tall and that, in his large office, his own desk area was raised about 7" to 8" above the rest of the room where any visitor would be seated. There was never a question about his ascendancy.

What about the tourist aspect of our trip? In Oxford, our visit had nostalgic overtones because I had entertained Nell and her father (chaperon) there in 1939. We toured Lincoln College and several other colleges, especially the gardens; the Christ Church Cathedral; my old laboratory, the Dyson-Perrins; Blackwell's Book Store; the walks along the Thames and Charwell. When we reached the Lincoln Boat House (it used to be a barge, but it sank), I was surprised to find Mr. Bossom there. He had been our boatman in my time, 1937-1939, and was then in charge of the boats and of poling (punting) us across the Thames. By 1960, he had been advanced to coach of the Lincoln shells and torpids as well. I introduced him to Nell, whom he asked in a charming manner whether she would like to see some photographs of her husband when he was on the Lincoln crew. Her seeing the carefully catalogued pictures elicited a very warm feeling on her part. Sir Ewart and Lady Frances Jones made us feel personally welcome, so the visit to Oxford was a great success.

In Cambridge, we were also made to feel welcome by Peter Sykes and his wife. Earlier, he had spent a sabbatical year at the University of Illinois and had audited my course in organic chemistry for undergraduates, given from an almost logical, physical-organic point of view. In the first edition of his textbook in the UK, Peter gave me credit for inspiring his similar approach to the subject. In later editions, possibly up to five at this time of writing, it wasn't necessary to refer back to the origin of his tremendously successful writing enterprise. Peter later became a spokesman on science-for-the-public on the BBC. Nell and I were impressed by the Sykes boys, and I trust they have done well in life. Cambridge is beautiful, certainly more rural than Oxford, and it was essentially unknown to both of us. I had made only one foray to Cambridge during 1937-1939. Peter was a dedicated guide on this 1960 occasion, imparting his knowledge and love of the place as well as its importance in the history of science. One of the famous Cambridge physicists of the time was Nevill Mott, who was well aware of his own ability. There was a student couplet that became popular at both Oxford and Cambridge, among both physicists and chemists, that went, "Todd thinks he's God, and Mott knows he's not."

In London, we paused for a day or two to review our earlier visit of 1939, during which we had affirmed that we intended to marry. We toured that city in three levels in personal time: 1939, when Nell and her father, Henri Jacques, and I were on tour and he discretely gave us some free time together; 1945, when I had been stationed there briefly in the bombed-out city; and 1960, by which time there was great resurgence and much new construction to see. We returned to Switzerland fulfilled and renewed and with an intended itinerary for a family return tour later in June.

First, back to the family visit to Holland during the Easter vacation. Nell and I went to Flims-Waldhaus one day ahead of vacation, stayed in a delightful pension on the square (that is still there), and Nell, particularly, did some sorting and packing of children's clothing so that we could travel light to Holland, which we did by train to Zürich and by Swissair to Amsterdam, where we were met by Nell's mother. It was a short ride from Schipol Airport to 's Graveland, where we shoehorned ourselves into Oma's little house at #203 Noorderinde. The gardens, the footpaths along the canals and slotjes, the hide-and-seek among the bamboo, the climbing of the friendly trees that dipped their limbs to the ground, the exploration of the beech woods, the visits and games with the Dutch cousins, and eating, lots of eating—all these were combined in one of the best weeks of our lives. We returned by TEE (Trans-Europe Express) train to Zürich and then on to Flims.

Then, back to Switzerland. It is my impression that the situation at the Kinderhaus improved somewhat. Nell sought to convince the "authorities" that American children liked to drink a lot of water and should be allowed to do so, and that the peanut butter and other goodies were for the children alone. I believe she gave the help some separate, small gifts to encourage them. The weather improved, allowing walks down to the two small lakes, Caumasee and Crestasee, and in the grounds of the Hotel Waldhaus, where the progress of the marmot colony could be observed. Life in Flims was simple, and regulated, but in beautiful surroundings. That is still part of the children's story to tell. Life in Basel became more active with the advance of spring: concerts, opera (limited), soccer matches, Sunday walks, visits to the museum and the zoo, indoor golf lessons in the Mustermesse, rides on the trolley system that went out to the suburbs, and—for Nell—church services in St. Leonhard Kirche. St. Leonhard was a celibate monk of some celebrity in the Middle Ages—no relation! We also developed lasting friendships during the short time we were there, which may seem surprising because the Swiss in general have the reputation of keeping to themselves. We found them most friendly.

We took a trip to Germany in May that started out in München, where we were guests of Professor Rolf Huisgen and his wife, Trudl. I gave two lectures, toured the facilities and talked with staff and students at the University of München while Nell was shown the architecture and museums of that fabled city. After München, we parted ways. Nell traveled to Holland to revisit family and I went on a lecture circuit that Rolf had arranged for me which included Göttingen, Marburg, Darmstadt, Heidelberg, and Karlsruhe and is described in the Sabbatical Leave Report. From Holland, Nell was taken by Oma and Tante Lien to Lugano, Switzerland, and

Rapallo and Pisa in Italy as a treat, and they stayed in hotels that had been earlier favorites of Tante Lien. When Nell returned to Basel shortly after I completed my German lecture tour, she was very fashionably dressed and coiffed and was thoroughly appreciative of what the females in the family had done for her. She had spent some carefree days during which she had no responsibility for her husband or children or even herself. That is a gift to remember and perhaps imitate. Oh, yes. She said there was an Italian naval officer who also tried to look after her.

Toward the end of our stay in Switzerland, there were two industrial visits that were very special. One was to Ciba, with the surprise gift of a commemorative medal, and the other was to Sandoz A.G. in Basel, where I lectured and where we were entertained in the evening by one of the Directors. Normally, after any lecture in Switzerland, cash money is given to the speaker "in lieu of expenses." In the case of Sandoz, the reward was even more useful. The Director asked where we were going next. "England," I answered. "We are going to take the children on a car trip, sightseeing and visiting friends." "Fine," he said. "Then I must recommend a car-rental agency in London that I find to be most accommodating. I will make the arrangements for you." He did, in fact, and there was no bill to pay! Nell and I went to Flims to gather up the children and their belongings. We had one full day of seeing all the sights and taking all the walks that the four had delighted in. We spent some time with Dr. Witzig, who came across as a charming schoolmaster, and with Frau Schlosser, paid the bills, and had a fine dinner in the Segnes Post for old-time's sake, that is, January/February of the same year. We sent the heavy luggage to Holland, and the next day we were taken to the train at Hanz by Dr. Witzig. We boarded the narrow-gauge Glacier Express (St. Moritz-Matterhorn), which we rode as far as Andermatt. It is one of the most dramatic train rides in the world and includes several sections of cogwheel drive. In Andermatt, we climbed up to a little church and then up a path alongside a brook that was rushing down the mountain full of the spring thaw. From the railway station in Andermatt, we took a train down to Lucerne on the lake of that name. We rode the ferries that ply all parts of that lake, and we walked along the Lucerne quay and through the covered wooden bridges in the harbor. Hans and Käthe Schmidt drove from Zürich to have dinner with us and to see the children. Good friends. I wish they were still with us. After the train ride to Basel via Berne, it was our turn to "show": the apartment where we had been staying; our favorite haunts in Basel—the zoo, the walks along the Rhine, the bridges, and the old town, plus some trolley rides. We all stayed in a hotel by the station that night and flew from Basel to London the next

day. I must say that all members of the family were marvelous travelers and put up with Father's herding without major complaint. I learned to tell all beforehand what would be happening, how we would be moving from place to place, and why we were going to visit this person and that.

London. We stayed in Brown's Hotel. We were given a magical tour of the center of London by Sir Keith Murray. Keith had been the Bursar of Lincoln College, Oxford, when I was there on my scholarship, 1937-1939. He had studied at Cornell at one stage and was fond of Americans. He had taught me to play squash, he had been tolerant of my complaints about the billing practices of Lincoln, we had played bridge occasionally with Leslie Falk and Dr. Hanbury, one of the Dons, and he was a great supporter of music. In the latter connection, Keith offered his sitting room with its grand piano so that Leigh Gerdine and I could give a recital. That occurred in the spring of 1939, when Henri J. and Nell visited me in Oxford. They were our audience. Keith was thus a helper in the entertaining and courting process. Keith was the Rector, i.e., President, of Lincoln when I returned in 1945. By 1960, he had established himself as a leading agricultural economist, was directing foundations, and had been called upon by the Queen for advice on various commissions. It was upon his advice that the first British colony in Africa was freed. Keith has always been one of my heroes. He visited Nell and me in Urbana when we were just recently married, during the summer of 1947. Thus, he seemed anxious to match our hospitality and to show us his London. This included the Horse Guards, the Parliament, St. Paul's Cathedral, the Tower of London, and the Annex to his Gentlemen's Club, where he took us to lunch. Only the Annex at that time was available for female and underage guests. We thought he was being brave because, as a bachelor, he had little notion as to the behavior of children in general. Nell and I had no particular worry, because we knew that our four could be depended upon to perform well in the presence of a Knight of the Realm. Lunch went well with only one hitch. None of the children had ever been confronted with jellied consommé in wobbly cubes before, so they met the first course with consternation and some uneasiness. When Keith saw the distress and the lack of any movement toward consumption of the consommé, he discretely asked the waiter to remove their bowls and replace their servings with warm soup. The rest of the meal went beautifully. One of my fondest recollections of that day was seeing each one of our four, at some time during the day, take Keith's hand, whether crossing a street, standing beside him while he pointed out something, or edging closer when we were near to the huge horses in the courtyard. Keith also remembers that day with pleasure, as he told me many times thereafter. We have some great movies

of the London visit, including the children being practically covered with hungry pigeons in Trafalgar Square.

Time to move on. We picked up our rental car in the center of London, and I drove bravely west in the direction of Staines. Rather, I drove and the passengers were brave. We stopped to see Kitty and Leslie Strang and their children, David and Judy, in Walton on Thames. I had known the Strangs since 1937, before they were married, and had visited them several times in the 1950s. I wanted to introduce them to my family, about whom they had heard on each of my visits. It was a short stop, with coffee and soft drinks, and there was a good climbing tree in the front garden for diversion, also a lovely back garden. The next stop for establishing family acquaintances was down in Kent. We took the southern circular route around London to arrive in Elmsstead Woods, which was the home of Mrs. Parsons, mother of Tony, Rodney and Rosemary. I had been a frequent visitor in the Parsons' home when I was at Oxford, and they had always shown interest in my "Dutch girl," our eventual marriage, and the birth and development of the children. Rosemary, the youngest of their family, now married, and her mother fixed us lunch in the back garden. That stop was very successful because at the end of the garden there was a deep railroad cut. Trains came by frequently, and the children found it necessary to run down to look at each one. I did some of that myself. We drove on a bit further to Sevenoaks, where Tony and Rosemund Parsons had their house, surrounded by adequate enough grounds to take care of their large collection of enterprising sons. Tony was one of two Tonys, great friends of mine from 1937-1939 and 1945-1946, who are remembered in David's middle name. An overnight stop was made north of London where Jean Harris, brother of David, now married to John Orme, had a house, Broom House, that was big enough for all of us. The garden was also big enough to host organized games, thoughtfully arranged by Jean. By these, I mean croquet, darts, and bowling, for example. She referred jovially to our coming as "the American invasion." There may be some uncertainty about the sequence of these family visits, but I do recall that we kept moving so that there would be a minimum of boredom and so that we would not overstay our welcome. In retrospect, it is amazing that the whole plan worked. It never would have worked if any of the four children had complained, been unappreciative, impolite, or just difficult. Bless them!

On to Oxford, the most important stop, as far as I was concerned. We were given a suite in the Randolph Hotel. Four beds had been moved into the long sitting room and arranged in a row, and there was still plenty of room to move about. Nell and I had the connecting double bedroom,

and there was a bath to share, plus a tiny kitchenette. On one of the nights we spent there, Nell beckoned me to come look at the quadruple array after the children had fallen asleep. She said, "I just wanted to remind you of how wealthy we are." We stood there a long time, hand in hand, looking at our sleeping children. They were sleeping deeply because we nearly exhausted them each day. We covered everything of interest in Oxford that we had planned on the earlier trip that Nell and I had made. In the front quadrangle of old Lincoln College, as we stood there and I described my time in the college, David looked about and said, "I don't know this place." It was really a philosophical statement. We ate well during our time there, and we also took time out for refreshment now and then. In particular, David, only six, tired from all the walking, and we would have to give him a Coca-Cola to keep him going. We rented punts and explored the Thames and the Charwell. I think everyone took a turn at punting, i.e., poling the craft along the shallow waters, and no one fell in.

The final stop in Britain was Henley, where we watched the famous regatta. We were able to avoid the crowds and to park by the Thames because Kitty Strang knew a farmer whose land abutted the river. She had arranged to meet us there and to show us where to park. All of that went surprisingly smoothly. She had brought along blankets and picnic refreshments, so we could spread ourselves out on the bank of the river. There was also an old farm wagon nearby that offered a better vantage point for viewing the races. However, there seemed to be some balance between sitting or standing on the wagon to watch the races and just climbing on and jumping off the wagon. The parents did not interfere. We did, however, discourage the children from riding on a merry-go-round and some other carnival rides that were arrayed further down the river. My thesis was, "You can always ride on a merry-go-round, but you will not see the Henley boat races again for some time." Several years later, they understood my point of view. I tried to make up for their disappointment by describing each race in detail—eights, fours, and single and double sculls—and infusing as much differential excitement as I could. After all, they were not "just a bunch of rowboats." Kitty and Nell had the opportunity of becoming friends while I kept trying to keep the children enthused. It was a good experience. We flew back to Amsterdam, were met by family, and stayed again with Nell's mother.

The final period before we left for the United States was filled with visits among cousins, with Opa and Jacqueline, and with old friends of Nell. The large garden in 's Graveland claimed many hours. Bicycle riding was perfected in the alley next to the garden. We went aboard a whaling ship, about to be dismantled, of which one of Nell's cousins had been the

captain, and inspected the small castle in which he lived. Croquet in Oma's garden kept us busy outside, and mah-jongg was but one of the amusements inside. We prepared for our journey home by purchases and discards. We were to travel by ship from Rotterdam to New York. I felt that one such experience was highly desirable because the opportunity might not arise again, given the demise of passenger shipping with the growth of aircraft transport. Moreover, I thought we should travel first class because we might never have the opportunity again as a complete family. We were to sail on the S.S. Nieu Amsterdam. On the appointed departure day, the children were still playing outside along the slotje (small canal) in front of Oma's house. I had a vision of one of them falling in the water, which was covered with green slime algae and was certainly unhealthy. I am generally regarded as having a pessimistic view of eventualities, but what I seem to do is think of the best and/or worst scenario when confronting a new situation. My "be careful" was not taken seriously enough, and David fell in the slotje. He clambered out quickly enough, and a "team" gave him a bath, threw away the soiled clothes, unpacked and put on new, and we had the contrite lad ready—still in time.

Many family members accompanied us to Rotterdam and the docks of the Holland America Line. It was quite a send-off. We had two staterooms in first class, near the bow of the ship. The story on the children's adjoining stateroom was that it was "compact but comfortable." Being in the bow meant that we were subjected to more up-and-down motion than we liked, but the rolling motion was suppressed. Whenever one or more of the four felt nausea, I walked them around the outside deck. This method was not restorative for Nell, however. She preferred to remain prone even though she had taken seasick pills. The rough seas lasted only two days out of the seven-day trip, which included initial stops at Cherbourg, France, and Southampton, England. Crossing the Atlantic in a luxurious and relaxed state is a wonderful experience. The children ate at the early seating each night. After some coaching with the menu options on the first night, we left the choices almost entirely in their hands, with some misguidance by the German waiter as to what they selected. Nell and I dressed each night for dinner (black tie, long dress) and joined the children at about the time they were finishing desert. People at the adjacent tables thought we were with the State Department because the Leonard four were so independent and well behaved. During the days at sea, there were the usual games and walks and refreshments at frequent intervals. The children had the "run" of the ship, except that we asked them not to run. They managed to see much more of the ship than Nell and I did, all at a walk, we were told. We received no complaints so we did not have to counsel

anything else but safety. They attended more movies than we might have advised, but they were certainly intrigued with the novelty and the freedom they could enjoy. David turned out to have more wisdom and greater observational powers than the other three had granted him. He saw sharks astern, devouring the edibles thrown overboard from the galley; then the Captain announced their presence over the loud speaker. He saw whales spouting off the port side, to which observation his siblings said, "Oh, David," in remonstrance. Then the Captain made the whale announcement, and David had earned respect for future observations, such as when dolphins were playing in the bow waves. Swimming in the indoor pool was possible only when the water was not sloshing about too much with the motion of the ship.

There is always reluctance to terminate a pleasant sea voyage, and we experienced the usual sadness, but we also felt elation as the Statue of Liberty appeared out of the fog, and we sailed up the Hudson River with the incoming tide. We were met by my Uncle Louis, and then we crammed ourselves and our luggage into two taxis for the ride up to Bronxville, where we were greeted by my aunts, Flora and Kate. Jim and I stayed in a hotel, while there was room for the others in the house on Brookside Circle. We took time for a trip to Playland at Rye, New York, which had been a favorite amusement park for me when I was growing up. David and I found a new ride called "The Mouse" especially exciting. We were wedged into a little car that scooted about on a huge raised inclined plane on a single track that meandered all over the surface, coming close to the edge quite frequently and suddenly. The sudden, jerky movements and quick turns were truly representative of the path a mouse will take. The aunts treated us to food the children liked and they listened patiently to the stories of the European experiences, adding some of their own and some about me. The aunts were in their eighties at the time and were very good at "embroidering" stories, as my mother always used to say. I would have written down their stories if I had had a stronger feeling that they were not exaggerating or adding a particular slant to the stories. Am I avoiding such pitfalls in telling my stories? My father was devoid of guile. To him, the Revolutionary War officer's sword that was used to cut wedding cakes in family ceremonies was actually a sword he and his father found in an empty barn after the Civil War. He told me that the French tutor the aunts had was really the French Canadian maid who worked for them part-time when they lived in upstate New York. Oh, well. The aunts' stories were amusing and served a purpose in improving the limited breadth of experience they had had. Moreover, they were always very good to me, and I had the opportunity of being good to them in their declining nineties.

Back to the Leonard family story of 1960. With the old Pontiac down off the blocks and its battery charged, we jammed it full of luggage that we didn't send directly, and we drove to Manistee, Michigan, in two days. Everyone but I settled happily into Dunewood. I was dispatched to Urbana to pick up Taina in order to make the family summer scene complete. The Drickamers had maintained her well and happy, perhaps too happy since she was overweight. It was lucky that I returned to the University because I learned that my secretary had been fired in my absence, and no one had notified me. No wonder so many deadlines had slipped by without response! However, I could not dally. I had to return our elkhound to her real family, who reformed her at least partially with diet and exercise, but we were unsuccessful in breeding her. The Gerzons of Indianapolis came to Dunewood while we were there and enhanced the beach scene of swimming, sailing, playing, eating and much discussion. Koert and I drew lots of chemical formulas in the sand. Nell and I tried to put into practice the golf lessons we had had in Basel. The rest of the summer passed well for the family, and I went off to Australia and New Guinea.

### **Sabbatical Leave, 1960 (continued)**

There was one more trip for me in August of 1960—to Australia and New Guinea. The purpose was to attend a meeting on the Chemistry of Natural Products, sponsored by the Organic Chemistry Division of the International Union of Pure and Applied Chemistry. The air route was from Chicago to San Francisco to Honolulu, where I stayed two nights as chemists gathered from many parts of the United States. It was a journey full of "firsts." I had my first surfing lesson on one of the very large boards that were used at that time. Oahu was beautiful, hospitable, and not crowded, but building plans were escalating. Derek Barton and I explored the island by rented car and I paid the rental fee; he paid for the gas, and we saw more of the island than the other chemical beachcombers. In flying from Honolulu to Sydney, Australia, we made two stops. The first, unscheduled, was at Christmas Island to pick up some high-ranking U.S. military personnel. They had probably been involved in nuclear testing of some sort. The island is now called Kiritimati since it was restored to the native population as part of the Caroline Islands (Kribati) under the Treaties of Friendship signed with the Kribati, Tuvalu, and Cook Islands in 1979-1980. The second stop, scheduled for passengers and refueling, was at Nadi, Fiji Islands, in the very early morning. This brief stop gave me my first view of the stars of the Southern Hemisphere. We landed in

Sydney but did not stay because we were to return there for the last stop of an unprecedented three-city meeting. The flight from Sydney to Melbourne was somewhat amusing. As we sat in the lounge area of the Lockheed Electra, we heard the pilot announce our speed. We asked the stewardess to inform our A.N.A. pilot that the Electras were not permitted to fly that fast in the U.S.A. An upper speed limit had just been established in the U.S., and the Australian National Airlines had not yet heard about it. Our pilot did not slow down on the basis of our unofficial information, but we did pique his curiosity. The plane held together to Melbourne.

I recall feeling cold in Australia. It would be like February in the U.S., but without as much hotel or house heating. The international meeting progressed from Melbourne to Canberra to Sydney, with lectures, tours, and social functions. The Australians, most hospitable, were showing off their country to advantage. It was a time to make acquaintances and develop new friendships as well as renew old ones. All who attended were impressed by the experiences and sights, whether it was the shared chemistry; a first glimpse of Western Australian flowers flown in to enhance the decorations; the side-curtained street cars of Melbourne; the layout of the capital Canberra and the War Museum there; the gum trees; the aspects of Sydney including the bridge, botanical garden, opera house under construction and endangered by sinking, the arms of Sydney Bay, the oysters; the beaches near Sydney (Bondy, etc.); petting a wallaby in a walk-through preserve; or holding a eucalyptic koala.

I had the pleasant surprise of being invited to participate in a free, post-symposium, week-long trip to Papua, New Guinea. We were an international group of twenty-four invitees, just enough to fill the small plane that carried us over the Coral Sea to Port Moresby. The territory was administered by the Australians in those years, and they introduced some usual rules and regulations. Alcohol was banned. Cannibalism was outlawed and had become only sporadic. Some light industry was promoted, e.g., manufacturing plywood from indigenous timber; cash crops were introduced, e.g., rubber and coffee; gold-mining operations were resuscitated, mainly involving a reworking of the tailings from the prior river diggings that had been ruined by Japanese bombing. The Australians were trying to convert the inter-clan attacks to athletic contests. Since Papua, New Guinea, achieved independence, so recent travelers tell me, there has been retrogression in most of these areas. Alcohol is no longer banned. Inter-clan fighting has increased, jails are full, lands of the "rascals" have been appropriated, and Port Moresby is a very dangerous place because those dispossessed have nowhere to go. I am sad to hear all this, because during our visit in 1960 I felt very comfortable with the natives,

some of whom were wildly (and permanently) decorated. In fact, it was probably part of a New Guinea public relations scheme for us to be greeted at the Port Moresby airport by just such a wildly decorated native, clad in a loin cloth and speaking perfect English. He was the official “greeter”, and he did his job astonishingly well. The astonishment was actually ours, most probably the reaction intended. Rather than describe step-by-step the events of that exciting week, I shall simply list my observations, experiences, and some stories about our group of chemists. Here we go, then, with no attempt on my part of creating complete sequential sentences.

### Port Moresby, Southern Part

Mangroves all along the water’s edge. Many sunken and half-sunken ships in the harbor from World War II. Great mixture of different indigenous peoples and Australians.

### The Highlands, Including Wau

Landing on the tilted, grassy airport that marked the furthest, surprise incursion of Japanese soldiers who had stumbled and climbed through the jungle from the north side of the islands. The U.S. soldiers had jumped out of their planes upon landing and had had to clear the airport of Japanese soldiers so that further planes could land. It is estimated that at one point in the conflict there were on the Islands of New Guinea one million soldiers either trying to find each other in the jungles or on the beaches—or actually in combat. General MacArthur had correctly discerned that the route to Australia through New Guinea was one arm of the pincer movement that the Japanese were following. The other pincer was through the Pacific Islands. Both routes were fortunately contained.

I was looking at some unusual vegetation along the top end of the tilted airport (there were no flat places among the steep hills). I was in a kneeling position. When I looked up, my eyes came even with a perfect death’s head, about 1.5 inches top to bottom. It was the back of a huge spider.

I saw *Alstonia constricta* trees for the first time, about 300 feet tall. During my doctorate research at Columbia

University, 1939-1942, I had been working on the constituents of the bark of this tree that had the native reputation of being antimalarial.

As my one-day companion Professor Holgar Erdtmann from Sweden and I walked down a jungle “road”, we decided to explore a bit into the jungle because he had a huge machete along. We estimated that we had to cut our way in only about 30 feet before it was almost too dark to see. On the way back out, following the machete marks, he freed two sturdy vines from their tree attachments so that I could play Tarzan, swinging widely (wildly?) at the end of one vine and jumping to the other vine as he passed it to me. Appropriate noises accompanied these gymnastics. What was my age? A mere 44. Holgar was noted for unconventional behavior!

One tribe in the Highlands was having a “Sing-Sing”, and it was attracting many visitors, including us. The men spent each morning getting painted and “dressed”. Each afternoon they paraded about to rhythmic chanting, and this went on into the night. A few of us did some parading with them in the afternoon, and the Papuans seemed pleased with our collaborative performance. This particular Sing-Sing had been going on about one month. During this time, pigs—especially piglets—are butchered and eaten. The native population is normally on a low protein diet, and the slaughter of the young pigs means that they will soon return to a low protein diet—for a long time. The Australians were attempting to prevent Sing-Sings, but they had some attractive magnetism. At such feasts, there was reputed to be some “lift-em leg” going on in the night. An interesting feature of this supposition was that there was no special increase in the number of births nine months thereafter. Also, according to repute there were special secret gardens where two varieties of plants were grown that had the combined effect of “the pill”. The Australians were never able to confirm all this. The original information had come from a Catholic missionary in the area.

Coming upon a native walking proudly along the road with his four young wives, all bare-breasted, my Illinois colleague

Roger Adams persuaded them that they should allow him to take a picture, which they gladly did. Then he persuaded the local chief, for that he must have been, to let Adams be photographed with his wives. That became Adams' 1960 Christmas card to his close friends.

The eating places were open on all sides, and vines grew in. We swore the vines were visibly extending themselves as we ate. John "Kappa" Cornforth, a brilliant, totally deaf chemist from England, later a Nobel prize winner, and I imagined that we were guarding our soup from the geckos (small lizards with toes having adhesive disks) who climbed the vines and walked the ceiling above us. They always looked as though they would fall down, especially into the soup.

Shoes had to be examined each morning to make sure there were no scorpions inside. Some of the old English and German professors put their shoes outside the motel-like rooms at night. We supposed they expected polishing. This was too much for two of our more exuberant younger chemists, and on the final night in the Highlands, the shoes were separated and randomly hidden. What consternation!

Up in Wau, there was a dour Scotsman living alone and directing a sluicing operation by natives for the recovery of gold. He did not like people and was happiest when the road up to his little house was washed out so that no one could come and bother him. I told him one of my odd wishes in life was to hold gold dust in my hand and allow it to flow through my fingers. He obliged by taking a heavy coffee can down from a shelf in his kitchen and letting me do just that. He used a small brush to replace in the can any gold dust that was still adhering to my hand. What a rich thrill!

We visited a new rubber plantation that was planted on an unprecedented slope of 18%. Orchids were growing in the crotches of all the young trees. A flock of white parrots flew overhead to make the exotic picture complete. I detected that the owner was Dutch, so I lingered after the official tour to talk with him. It turned out that he had attended the Dutch Agricultural University in Wageningen

with my wife's first cousin, Jan Dinger. Somehow, one discovers that all Dutch are connected in some way. On the basis of that, I was invited into the house for tea, met his wife, and I was given the opportunity of taking a dip in his swimming pool. We got along very well. When it came time to leave, he said (the Dutch are always frank), "Oh, by the way, I should tell you that I didn't like Jan Dinger too much. It is only fair to say that." I told him that I was not very fond of Jan either. We parted good friends.

The trip down to Lae, the port on the Northeast shore, was managed in open command cars along a twisting road, one lane and very dusty. The drivers were coastal natives who seemed to have a sixth sense that told them when someone or something was coming up the mountain on the same road. The road itself clung to the side of various cliffs in a very unconvincing manner. We came upon one chap who had never seen a white man before. He had come out of his village to hunt some rat and tree kangaroos, and he had special arrows for each, along with his bow.

On a coffee plantation outside of Lae, as I talked to the owner, an *Anopheles* mosquito settled on my arm in characteristic tilted, head-down position. The plantation owner asked me what I was taking as a prophylactic against malaria. I said, "Chloroquine." He said, "Let the mosquito bite you," so I did. When he found out that I had worked on Chloroquine as part of the war research, he was delighted. He told me that on the wet North coast he would not have been able to maintain a plantation if it weren't for the antimalarial Chloroquine.

We said goodbye to Papua and to our Australian hosts and guides in a typical Australian "farewelling." I am sure this was invented by the Australian men so that they can kiss, very fondly, all the women present at the time of goodnight or goodbye.

We flew from Lae to Sydney and back to Honolulu, which seemed remarkably insipid and civilized after our sojourn in New Guinea. From Hawaii, it was back to Chicago and home after a memorable journey.

## ILLINOIS YEARS—1960-1968

### Family

This was another period bounded by two sabbatical leaves from the University of Illinois: the Swiss sojourn followed, for me, by the Australian IUPAC Meeting and the New Guinea adventure in 1960 and time spent at the University of Wisconsin, Rockefeller University, and Israel in 1967-1968. The latter sabbatical was also supported by a Guggenheim Fellowship, which was lucky for me because it is no longer the practice of the Guggenheim Foundation to award a second fellowship. For the children, it was a period of concentration on schooling. Ken and Marcia survived the shock of returning from the Progymnasium in Flims, Switzerland, to their respective grades in middle school in Urbana, Illinois. Nell had tutored them a bit in preparation. Ken attended Urbana High School during the period 1963-1966, ran cross-country and track, and was the cartoonist for the school paper. The high school was only two-and-one-half blocks away from our house. Ken applied to a number of schools of architecture and was accepted by the University of Illinois where he shifted to a major in graphic design (1967) after his first year, during which time he lived at home. He claimed a section of the basement and used the side door for entry and exit so that his parents would not have to worry about his comings and goings at odd hours. (We did, anyway!) Jim and Dave remember especially one of his lengthy projects then or later, in which he was carving up pink Styrofoam blocks to assemble some large structure that supposedly had a purpose. It was hard to rid the basement of the flecks of pink Styrofoam that retained static electrical charge, a reminder of his presence and diligence. Ken had a life that was rather separate from his siblings, but we were all together over Christmas/New Year vacations in Aspen, Colorado, and at least one summer month in Dunewood, Manistee, Michigan. Ken lived in a fraternity during his second year at Illinois, then in a rented house with Chip and Chrissie Frey in his third year, and back home in the fourth.

Marcia was on a teen fashion board of one of the local department stores and she kept up with her dancing. She says that she felt somewhat

isolated in Urbana High School because the girls seemed to arrange themselves in cliques. She was being—or becoming—an individualist, as were both of her parents. It is of interest that a group of the ten of the high school girls has met for reunions at approximately five-year periods and has become more cohesive and supportive in recent years, with Marcia as the organizer. The children's separate telephone was on a long cord in the upstairs hallway. Some privacy could be achieved by carrying the telephone into one of the three bedrooms or the bathroom. Social life in the high school years revolved about the Tigers Den in the Urbana Civic Center, where there was dancing to live music on Friday and Saturday nights. The old railroad station in Urbana was converted to a theater for amateur productions and for occasional exhibits. Nell and Marcia had a good mother-daughter relationship, only occasionally tested by the inherited strong personality traits that had come down through the female line of the family from the time of Napoleon. Jointly-held principles of fairness, justice, and equality were modulated by an abiding love. I have talked about Nell's reading to each of the children. David remembers especially Marcia's reading to him "a lot."

Everyone remembers Nell's great meals. They also remember Taina, everyone's dog, standing in Mother's way and staring at her coldly while she was preparing dinner for the family (instead of for her). Taina's main activity in the house during 1959-1970 was to nest under things—bookshelf, chairs, table, desk, or piano. Walking the dog or taking her to the park was an ad lib family assignment. She remained overweight and had a tendency to perfume herself by rolling in unspeakable material; otherwise, she was a very loving dog.

When Marcia went off to college in 1967, namely, to the University of Wisconsin, Madison, we all missed her. She had been an excellent older sister to Jim and Dave all through their growing-up years. Marcia still remains in close contact with her roommate of the first years at Wisconsin, but it took Marcia some time to recognize her own self and her own purpose. Because I had initiated a research collaboration with Professor Folke Skoog, an eminent plant physiologist at the University of Wisconsin, I *had* to visit Madison from time to time, which meant that I could see Marcia and take her and her roommate out to dinner. For more about Marcia's college education, see the next chapter.

During this rather arbitrarily selected time period, James was advancing from 8 to 16 years old and David, from 6 to 14 years old. They were good friends, as I hear from each of them, but they had their own interests and their own friends outside the family. Each now tells of the other's good sense of humor and of some of the mischief that they devised together.

They both joined Little League and, during two years, were on the same team. Both liked to construct things, and Jim took to airplane model building in serious fashion. Jim followed Ken into Boy Scouts. When we offered golf lessons to each of the children in turn during summers in Michigan, Ken enjoyed the lessons but not the practice, we found that Marcia needed glasses because she could not follow the ball when she hit it, and only Jim took it seriously enough to become a tremendous hitter, although not always accurate. Jim liked to earn money, as demonstrated early when he worked a paper route (or two). He still keeps in touch with his Urbana High School classmates, about 30 of them, and claims 10 of them as his close friends. He was an activist President of the Student Senate in his junior year, during which the school dress code, considered restrictive, was changed. Also, the school buses that were used to transport students between the high school and the north end of town were old and ramshackle. The Student Senate convinced the School Board that they were unsafe, and new buses eventually appeared. Jim was on the 'Tigers Den Council that put on dances at the Urbana Civic Center and was in charge of hiring bands, advertising, security, etc.—in short, of running the club. In one summer, the Council put on a financially successful rock festival. In his senior year, Jim—anticipating his working age somewhat—had a job with his friend, Andy Green, hauling equipment for a rock band that in time became well known. When 16 years old, he had a job in an all-night diner that provided some interesting experiences and fortified his ability to assume responsibility.

When David was in Little League, he liked to talk to his mother about baseball and felt very comfortable in doing so. Nell followed the St Louis Cardinals on the radio while knitting, and she knew a great deal about the players and their relative abilities. David also confided in Maggy Lou Perry when she gave him (a) a lunch that included, if he could convince her, her special fried potatoes, and (b) a snack when he came home in the afternoon. Whenever he was shunned by his older siblings, he had Taina to talk to and play with. Dave regularly arrived home late from school when he was in the 7<sup>th</sup> grade. Nothing was said, but Nell's curiosity caused her to drive by the schoolyard, where she saw Dave on the front steps surrounded by a group of his black classmates. He was conducting a voluntary tutoring session that was teacher-approved. David started playing the drums in 5<sup>th</sup> grade and obtained more equipment during the 7<sup>th</sup> and 8<sup>th</sup> grades, when other would-be pop musicians started populating the basement in the later hours of the day. I offered the following deal: any member of the family who was serious enough about a musical instrument to take lessons regularly could have that instrument and it would be his

(her) property, even to sell when he (she) tired of it. The same was true for athletic equipment.

It was really Nell who created the home atmosphere. I was working very hard, very long hours and averaging two chemistry trips per month. She was taking on more and more responsibilities in the League of Women Voters. Her tennis and bridge provided recreation, plus golf in the summer. Our circle of friends kept expanding, and the entertainment of my research students became a regular function. The children recall that we seemed to have many dinner parties. I recall that Marcia assisted with the special ones, while the others made brief, polite appearances.

Lecture invitations became plentiful during the 60s, and international meetings provided additional speaking opportunities, i.e., two in Europe in 1962, two in Japan in 1964, and one in Sweden in 1966. The whole family joined in the visit to Sweden, where, in Stockholm, Professor Holgar Erdtman and Gunhild Aulin-Erdtman arranged excellent accommodations for us in a pension that was convenient to the meeting center and to the tourist attractions of the capitol. The public transportation system in Stockholm is so efficient, or at least it was in 1966, that the four young Leonards, ages 12-18, acting as a team, saw everything they wanted to see and ate in automats where they could select from food on display. When Nell and I went to a banquet at the Wenner-Gren Foundation, the Erdtmans provided a separate table for the "team," who behaved admirably. At the end of the meeting, we treated the team to a trip to the North Cape, with travel through Sweden, the north of Finland, and along the fjords of Norway by train, ferry, bus and steamer. On the overnight journey by train going north from Stockholm, the team was amused by their father's standing at the end of the sleeping car so that he could mark our crossing of the Arctic Circle. "But Dad, that's just a geographic term," they said. "You wait and watch carefully," I rejoined. Sure enough, when it came time for crossing, there appeared a line of whitewashed rocks stretching away from the tracks about one hundred meters, labeled "Arctic Circle." The children were suitably amazed and amused. I was certain that there would be some designation of the crossing, and I was happy to hear their ridicule turn to appreciation. We went by bus down into the famous iron mine in Kiruna, Sweden, by ship and bus into the north of Finland, and again by bus to the North Cape (Sweden), then southwest and along the coast of Norway by steamer (fantastic smorgasbord breakfast and lunch). My favorite port on the Norwegian coast was Tromsø, which has a "crystal" church. I was so stimulated by the long hours of sunlight that I roamed the streets at midnight, came upon some boys playing soccer, and was allowed to kick the ball with them. Because there was little

difference at that time of year between day and night, their play outdoors was apparently regulated by when they were tired and felt they needed sleep, not by a strict parental timetable.

We toured further south along the coast of Norway by steamer, then by train across the frontier into Sweden at a ski resort, and back to Stockholm also by train. From Stockholm, we flew to Switzerland. Train from Zürich to Chur and bus to Lenzerheide brought us to a Dutch reunion with Els's family. The combined ten children ate, played, hiked, and climbed together. I was spirited away by Prof. Pl. A. Plattner, the Research Director of Hoffmann-LaRoche. How did he find me? I had left an itinerary with my secretary at Illinois, so he knew I was supposed to be in Lenzerheide with my family. He drove from Basel to Lenzerheide in his little Porsche, parked, and started walking through the town. We were staying in a pension, and there are many of them. We would have been hard to find, but luck intervened. He spotted some Leonard kids, either outside the post office or a chocolate shop, pulled out the family Christmas card we had sent him, approached the flock of children and asked them where he might find the particular ones whose photos were on the card. Spectacular reaction! The troop led him to our pension, and I was dragooned to drive back with him to Basel on the following day. I had a long interview with the President of Roche, who was interested in filling the post of Research Director of Chemistry in their U.S. branch, salary unspecified, i.e., as high as necessary. Since I had made the decision of university versus industry employment on several previous occasions, I considered my role to be one of offering advice, which I continued to do, to good avail, when I returned to the United States. Two of my recommendees, in sequence, were offered the position but were retained, with advancement in salaries, at their respective U.S. institutions. The successful appointee was Arnold Brossi, who had received his Ph.D. from the E.T.H. in Zürich—an excellent choice. He generously sought my continued advice, and we became great friends for years thereafter, during which the advice-giving member of the team exchanged place.

I returned to Illinois to complete some university business while the Dutch family reunion continued in Switzerland. When it came time for my family to return home, they got as far as London, where they were halted by an airline strike. The problems to be solved consisted of (1) claiming accommodations for the night, (2) acquiring new reservations for flights to U.S. for five people on the following day, and (3) notifying me at what airport they would be landing. To add to the complications, Nell was ill, so Kenneth took over. The ground personnel must have been charmed by his polite persistence on behalf of the family, for he succeeded in

accomplishing (1) and (2). It was 6 o'clock the following morning when I could learn, at the opening of the telegraph office, where they were arriving. It was to be Detroit. I had further instruction to alert a friend of Ken's who was to be picked up and driven as far as Grand Rapids, there to be ticketed on a bus to Manistee. Of course, all of this required some fast driving on my part, which was detected in Kalamazoo, where a speed limit was posted as 45 miles per hour on the west side of a traffic light (green when I reached it) and 35 miles per hour on the east side. I pointed out to the officer who stopped me the inequity of this arrangement, which he knew very well because of several vehicles and several officers who were in "conference" on the side of the road to the east. I indicated that I knew Kalamazoo well, having sung often at the chapel of Kalamazoo College which was just above us within view. He seemed to be in the mood for chatting rather than for harsh action. We continued our talk until the other stopped vehicles had left; then, he allowed me to continue on my journey. He had cost me time but no money. When we reached Grand Rapids, I realized that I would not be able to arrive at the Detroit airport by the time my family was due. Seeking a solution to this dilemma, I telephoned Carl Johnson, former Ph.D. who was teaching at Wayne State University in Detroit. He volunteered to meet them upon their arrival and did, to which they responded with surprise, some pleasure, and some disappointment that I had not planned my drive well enough to reach the airport on time! After gathering luggage, talking a bit, and some stalling for time on Carl's part, Carl looked at his watch and suggested that I should be driving up the ramp "just about now." That is just what happened. We drove to Cadillac, Michigan, had supper in our favorite restaurant, buffet-style, picked up Ken's friend in Manistee, where he had time to read a book, and drove on to Dunewood. That refreshing place put us all at ease and almost instantly restored Nell's well-being. We stayed there until the beginning of the school year.

## Research

New research programs were initiated in 1960. One of these started with the isolation of triacanthine from the new leaves of the honey locust tree (*Gleditsia triacanthos* L.) that James Deyrup had gathered, with the aid of some assigned convicts, in Dixon Springs, Illinois. A thorough study of the structure and chemistry of triacanthine established that it was 3-isopentenyladenine. The position of the group on the 3-position of the ubiquitous adenine nucleus was unusual, and this initiated one branch of

research on 3-substituted adenines in biochemistry. The nature of the substituting isopentenyl group initiated another branch of research in plant physiology. Some of the earlier research problems still had momentum, however, and thus claimed equivalent priority.

One of my graduate students left to see if he could advance in medical school, leaving an obviously gravid project behind. Carl Johnson took it up with alacrity and thereby provided a general, facile method of converting sulfides to sulfoxides by aqueous sodium metaperiodate oxidation. This simple method could be applied to medium-sized rings containing sulfide and carbonyl functionality. Carl found that the monocyclic 8-membered-ring 1-oxo-1-thiacycloöctan-5-one plus perchloric acid underwent a transannular reaction involving protonation of the carbonyl oxygen and formation of a bicyclic system. The conformation of the original monocyclic compound was established by determination of its electric dipole moment, while the structure of the salt, having a positive charge on the sulfur and a new hydroxyl group, was established by infrared spectroscopy and by proton magnetic resonance. Methoxy and acetoxy compounds could be made from the transannular salt, thereby providing unique functionality. Carl resolved the question of the mechanism of hydrolysis of the acetoxy compound elegantly by means of solution kinetics and the use of  $O^{18}$ -water, namely: the transannular transfer of an oxygen atom, i.e., the sulfoxide oxygen becomes the carbonyl oxygen. I asked Carl how he had thought up the foolproof method of determination of the course of the reaction. He replied that he was in the process of writing a letter to his mother when the idea occurred to him. From that time onward, whenever a student ran into a problem for which there was no immediate solution (and the research director also could not provide an immediate solution), I suggested that he (she) write a letter home to mother! The usual student response was a very quizzical look, requiring a retelling of the Carl Johnson story.

Another problem developed from our earlier study of the iminium functional group. One of the reactions of iminium salts, i.e., with diazomethane, led to aziridinium salts. Klaus ("Bob") Jann, a postdoctorate from Germany, made the prototype. The key to isolation of these three-membered-ring compounds, which had been previously postulated mainly as unstable intermediates, was in the selection of a non-nucleophilic anion portion. Once we had found the way to isolate the pure aziridinium salts, we studied them systematically, with the attendant benefit of discovering their potential synthetic utility based upon hitherto unknown ring-expansion reactions. Our research on iminium and aziridinium salts was cited when I received the American Chemical Society Award for Creative Work in Synthetic Organic Chemistry, 1963.

“Spatial Control of Organic Functionality” was the title selected for my Julius Stieglitz Memorial Lecture, 1962, sponsored by the Chicago Section of the American Chemical Society. It covered our findings of transannular interactions and reactions mentioned earlier, in rings of medium size (8-11 members), especially the new functionality created when pairs of donor and acceptor groups are placed diametrically opposite each other: amine and carbonyl, sulfide and carbonyl, sulfoxide and carbonyl, amine and sulfoxide, amine and oxime, and many others.

The most amusing aspect of this research resulted from my placing in the hands of Professor Jack D. Dunitz, E.T.H., Zürich, two crystalline samples of aminoketones that exhibited transannular interaction. If that eminent crystallographer could determine their structures in the solid by X-ray, he could solve the issues of the conformation of the medium-sized rings, the angle of N approach to C=O, and, of course, the interatomic distances. That was my thinking. While the methodology was not yet in place in 1960 for the facile solution of the x-ray structural problems, the situation changed with time. The samples that were placed in Jack Dunitz’s desk drawer were forgotten and were rediscovered only years later when Jack was moving to new quarters. The crystal structures, when published in 1975, confirmed that the N—C=O nucleophilic approach trajectory is such that the angle between the developing N-C bond and the C=O bond is about tetrahedral. In a talk in 1974, prior to publication, Dunitz amused his audience by stating that it had taken 14 years to solve the structures of these two small molecules!

It was the 3-isopentenyladenine (triacanthine) that fostered an entirely new area of study. James Deyrup worked out the chemistry, and Richard Laursen’s unequivocal synthesis of 3-isopentyladenine provided a means of direct comparison with the dihydro derivative of the natural-source compound. The research suddenly went international when I sent samples of triacanthine to Europe that were found to be identical with the togholamine of Dr. A. Cavé and Dr. R. Goutarel (France) and the chidlovine of Dr. X. G. Monseur (Belgium) that were isolated from diverse natural sources. We published a jointly authored paper in a French pharmaceutical journal. Dr. Tozo Fujii, a visitor in our Illinois laboratory from the University of Tokyo, in the meantime, learned how to place an isopentenyl



NJL, University of Illinois, 1963

group at any of the five nitrogens of adenine by means of suitable blocking groups, thus paving the way for selective synthesis of any desired N-substituted adenine. The 1-isopentenyladenine is interesting because it can be rearranged to *N*<sup>6</sup>-isopentenyladenine by treatment with alkali or by autoclaving. The latter was also made by A. Cavé, as reported in his Doctor of Natural Sciences thesis in the University of Paris.

I could interest Professor Folke Skoog of the Department of Botany (now, Plant Physiology) of the University of Wisconsin, whom I had not yet met, in the testing of these compounds for biological activity, namely, the growth and differentiation of plant callus tissue and in the prevention of leaf senescence, so-called cytokinin activity. My stimulation of his interest was based on the structural similarity of the compounds to kinetin, an unnatural product of the autoclaving of DNA. We were pleased to learn that *N*<sup>6</sup>-isopentenyladenine had ten times the activity of kinetin and that the N1-substituted isomer had fractional activity as a result of its partial conversion to the *N*<sup>6</sup>-isomer during the autoclaving process. We realized that there were many questions to be answered: (a) could the *N*<sup>6</sup>-isomer be found in nature; (b) the rearrangements should be studied further; and (c) determination of structure-activity relationships was in order. Our particular combination of chemistry and plant physiology involved a close collaboration between Illinois and Wisconsin that lasted 18 years, thus well beyond the arbitrarily selected 1960-1968 period under consideration, and it resulted in about 50 publications. It involved many visits back and forth, exchange of students and postdoctorates for the effective mastery of ideas and techniques, and eventual involvement and collaboration with half a dozen other scientists.

*N*<sup>6</sup>-isopentenyladenine was indeed found in nature, in the plant pathogen *Corynebacterium fascians*, by Hamzi and Skoog and was identified and fully characterized in our laboratory. After the first two back-to-back publications, we followed with only joint publications. The Wisconsin-Illinois team's search for other naturally occurring cell-growth, cell-differentiation factors uncovered eight additional highly active substances from plant, animal, bacterial, and fungal sources. We carried out stereoselective syntheses to produce these compounds, and our structure/activity investigations led to agents even more active than the naturally occurring cytokinins. Used in very low concentration, the cytokinins initiate plant, flower, and tree growth in tissue culture. This feature is basic to horticultural and agricultural development. The culture and growing of gerbera in California constitute one example of economic importance that has resulted from tissue culture using added cytokinin, usually *N*<sup>6</sup>-benzyladenine in this commercial case. A very recent finding by Dr. Marvin

D. Siperstein, Professor of Medicine at the University of California, San Francisco, indicates that *N*<sup>6</sup>-isopentenyladenine (now abbreviated iP) is, in fact, an importance link between plant and mammalian systems, and, like mevalonate, it stimulates DNA synthesis specifically during the S phase of the mammalian cell cycle.

Innovation of 3-substitution on the adenine nucleus stimulated us to synthesize 3-isoadenosine, and, through the urging of my student Richard A. Laursen, we ventured into the realm of its 5'-mono-, di-, and triphosphates and the NAD<sup>+</sup> analog based on 3-isoadenosine in the anticipation that these would serve as *spatial probes* of enzyme-coenzyme binding sites. Indeed, they are. We were fortunate to secure the collaboration of several laboratories in determining the wide range of biological activity of 3-isoadenosine and its phosphate derivatives, similar to that of the natural adenosine and its corresponding phosphate derivatives. The similarity, while possibly initially surprising, is readily understandable in spatial terms. Thus, the superposition of the purine ring of a 3-isoadenosine derivative over that of adenosine illustrates the close relationship that exists between the two, especially the proximate location of the individual nitrogens in each. When the necessary methodology for oligonucleotide synthesis and X-ray—and NMR—structure analysis came into being some 30 years later, we could confirm the hydrogen-bonding pattern that had been first postulated.

There was another research project in our group that had a major industrial and economic impact many years later (see the Postscript that follows this section). My graduate student G. Edwin Wilson, Jr., initiated the investigation of the hypothesis that a transannular route might be operative in the biosynthesis of penicillin. He made the necessary 7-membered-ring precursor, with all substituents in place, to test the suggestion that oxidation of the monocyclic system could lead to the bicyclic ring system that is present in penicillin. Oxidation with chlorine led instead to rearrangement, with the formation of 3-isothiazolones containing a monoheterocyclic system, i.e., a 5-membered ring. I added a paragraph to the long Leonard and Wilson article in the 1964 issue of the *Journal of the American Chemical Society*, stating that it was of interest that the isothiazolones produced a zone of inhibition when placed on an agar plate seeded with *Bacillus subtilis*. This had been Ed Wilson's method of testing, on the bench top, whether an antibiotic was produced on oxidation of the original 7-membered ring. No, it was not the hoped-for penicillin that had been produced, but the initial disappointment was followed by the excitement that the isothiazolones were biologically active. William D. Crow, a postdoctorate from Australia, joined my research group and

provided a simple, direct method for the synthesis of 3-isothiazolones, illustrating the procedure with the N-ethyl compound. The work was presented at the Chicago meeting of the American Chemical in September, 1964.

In December, 1966, we moved from Noyes Laboratory to the new building, now named Roger Adams Laboratory, where we could test the organic chemistry laboratory facilities so long in design and construction. I learned that there was some intense betting going on as to whether Dr. Leonard would make the deadline for evacuation from Noyes Lab of all his library and research belongings. It must be said that I worked late into the last night and next morning to confound the critics who had predicted my even worse procrastination. The only sad thing about the move was that some overzealous janitors threw away valuable spectroscopic data stacked in a barrel that they mistook for trash. One needs the original data for publishing the findings. The occurrence was so traumatic that I could only forget the work and could never publish the many papers that might have resulted. Perhaps it was not a great loss to science, but it was indeed a loss to me and to my research colleagues.

## Postscript

Approximately 20 years after we had published and presented our work on 3-isothiazolones, including the antibacterial activity of the N-ethyl derivative, I received a telephone call from William E. Goode, who had been a Ph.D. student of mine in the late 40s. He had become the Vice President of the Rohm and Haas Company and wanted to know whether I would be willing to make a trip east to visit their new research facilities, all expenses paid plus an honorarium. The rest of the conversation went something like this:

“Would you like me to lecture, and on what topic?”

“No, thank you, just come for a visit.”

“What time would you like me to arrive?”

“Any time it would be convenient for you, but preferably before lunch. We would like you to come for lunch.”

“When would I return?”

“Oh, possibly mid-afternoon.”

“OK. I would like to see you again, but I don't usually fly from Illinois to New Jersey for lunch.”

“Let us know when you plan to arrive, and we will have a company car at the airport to meet you.”

The transportation worked perfectly. Upon my arrival at Rohm and Haas' new research location and after greetings and a cup of coffee, the enigmatic conversation continued.

"We would like you to sign a secrecy agreement."

"I don't know that I can do that. I have an exclusive consulting agreement with Eli Lilly and Company."

"We are sure that it will be all right. We don't want to ask you for advice. We want to give you some information, as a courtesy."

"Great, I am always receptive to information."

Then, Bill and the others proceeded to tell me that they had read the articles in which we described the synthesis of 2-ethyl-4-isothiazolin-3-one (its systematic name) and its mild antibacterial property. They had decided that a long N-alkyl chain would render this type of compound paint-soluble, would be easy to make from readily available R&H stock, and might retain some of the biological activity of our original compound. They thought I would like to hear of their success before it became public knowledge! I was delighted to learn that a small piece of fundamental research had produced a practical result some years later. Their lead compound was the N-octyl derivative, called "Skane<sup>®</sup>M-8" in its industrial formulation. Skane<sup>®</sup>M-8 mildewcide has been formulated into primers, house paints, and trim paints—all latex, oil, and alkyd paints—and has demonstrated effective mildew resistance when applied to bare wood or to repainted surfaces. I am not in the business of advertising the product but the following properties can be expected of it: (a) no side effects on the paint film, (b) stable, (c) economical, (d) low toxicity, and (e) easy to formulate. It also has microbistatic and fungicidal activity, reflecting our original finding on the N-ethyl compound. There followed (1994) from R&H, Kathon<sup>®</sup>LX 1.5%, a microbicide and fungicide for preservation of formulated adhesives and construction products, including asphalt, caulking, coating, cement, stucco, and clays. This product is also relatively nontoxic. Sea-Nine<sup>™</sup>211 (1992) is an antifouling agent containing dichlorinated N-octylisothiazolone. It is used on the hulls of ships to prevent the formation of a slime layer, and thus a loss in ship speed, caused by the usual adherence of bacteria and diatoms, also protozoa, freshwater and marine algae, and especially barnacles. In 2001, R&H was awarded the National Medal of Engineering on the basis of the improvements brought about in preservative painting and realized in efficiency of transport by their products.

If I am asked whether I should have patented our initial 3-isothiazolone and have tried to benefit financially, I can only say that the system worked very well as events occurred. My research was supported by a U.S.

Government grant. The source of the money was taxation. I did not know of the needs in painting and shipping, nor did I imagine what different substitution of the isothiazolone would produce in the way of properties. R&H research read my articles in the open literature, invented new compounds, manufactured, profited, and paid taxes. Thereby, additional fundamental research could be supported. A success for science!

## SABBATICAL LEAVE, ISRAEL, 1968

Our visit to Israel during February to April of 1968 was initiated by David Ginsberg, whom I had met first at Columbia University when he was a student in a chemistry course in which I was the laboratory assistant. He had become a professor of Chemistry at the Technion, Israel Institute of Technology in Haifa, and was distinguishing himself in research and writing. I was to be a Visiting Professor at the Hatechnion, the portion of the Institute that was on the hilltop overlooking the city. We flew by different airlines from Chicago to Tel Aviv in accord with our habit, while the children were still in school or college, of not flying together. After breakfast together in Chicago, we flew in separate planes to New York, where we had lunch together. Then, Nell flew by KLM to Amsterdam, where, in the morning, she had time to visit with family members at the airport, and then flew on to Tel Aviv. My TWA plane stopped in London and in Athens, Greece, en route from New York to Tel Aviv. Greece was under a military dictatorship, and passengers were confined to the airport during the stopover. Nell and I landed at the Tel Aviv airport within fifteen minutes of each other. That was according to plan, but it was still surprising that it worked.

We were met at the airport by Dov Ben-Ishai and were driven to Haifa by the main road along the coast, passing orange groves, wind-sheltered by cedars, and kibbutzim that consisted mainly of chicken farms. We stopped for pancakes and then came into Haifa under the lighthouse, saw the panorama of the harbor, and proceeded to guest house #3 of the Technion. In the next few days, we were treated to tours of the Department of Chemistry of the Hatechnion, the city and harbor of Haifa, and Roman and Turkish aqueduct ruins. Nell and I took brief walks around Mount Carmel and rode on regular buses to acquaint ourselves with their routes. We were guests of the Dov Ben-Ishais, the Eli Loewenthals, and the Frank Herbsteins at dinners and lunches. In the absence of David Ginsberg, who was on a lecture tour in Europe, a close friend of his, a Mr. Stiefel, kept us busy touring when our own initiatives seemed to be faltering. There was much to see, and life seemed to move at an accelerated pace due to (1) current events, (2) recognition of recent and past history, and (3) relating biblical stories to specific sites. Thus, we saw

Acre, Naharija port, the border with Lebanon, the Beit She'arim catacombs, the Jazreel Valley, Nazareth, Kafr Cana (site of the water-to-wine miracle), Tiberias (built by Herod, 686 feet below sea level), Degania (first kibbutz established in the Palestinian territory, 1909), Ein Gev (kibbutz on the eastern shore of the Lake of Galilee and directly under the Golan Heights), and Mount Tabor (the meeting place of three out of the twelve tribes of Israel).

After this orientation, it was time for me to spend time in the laboratory and to give seminars, which I did at the rate of about one per week, and to talk chemistry with members of the Technion department. Nell did the housekeeping chores of laundry (she noted, "What else?" in her diary) and shopping at the nearby food store (frequently, because there was no transport), but she was able to take in the sights that intrigued her, such as the International Training Center for Community services; the Druse village Daliyat on Mount Carmel; Ein Hod, an artists' village; in Acre (Acco), the museum, the Crusaders' fortress, the crypt of St. John, the prison where "Exodus" was filmed, a nursery school for poor children, and a mental hospital.

In our second week in Israel, we went by taxi and train to Tel Aviv, where we were met and driven southeast to the Weizmann Institute in Rehovot. Our tour of Rehovot and the Institute included a visit to the grave of Chaim Weizmann, the founder of Zionism, and historic sites. I met and talked with the chemists, some of whom were famous or were on their way to fame, including Ephraim Katchalski, who later served a term as President of Israel. After my lecture in the afternoon, we were treated to a tour of the main buildings of Tel Aviv and the reconstructed site of Jaffa, where we had an excellent dinner in the Tarshish Restaurant (bourri, the Mediterranean fish). The guest house of the Weizmann Institute was most comfortable. After breakfast the next day, we left by a "United Tours" bus to Eilat, with fascinating stops along the way:

Yavneh—one of the holy cities of the early Jews

Ashdod—ancient Philistine coastal city

Ashkelon—ancient Philistine coastal city

Beersheba—site of the ancient well of Abraham, administrative center for the Negev, center for sheep and goat trading by the Bedouins

Yeroham—beginning of the Wilderness of Zin

Sde Boker—oasis

Avdat—ruins of the ancient city of the Nabateans

Eibat—in present time, a resort on the Gulf of Eilat, adjacent to the Jordanian resort city to the east. There we could swim and, in glass bottom boats, survey the protected coral reefs with their varicolored fish.

After spending the weekend at Eilat, we were to return via Tel Aviv to Haifa. We went to the airport to find out how this could be done. When Nell learned that there were not many planes on the schedule, she decided that it would be OK to fly together in the old DC-3 that was sitting on the tarmac. Why? Her reasoning was that for a plane to be that old, it had to be loved and well-maintained, and it would be safe for us to fly together on such an aircraft. It was our first time to fly together without the children, and we did arrive safely at our destination.

I indulged myself in another week of talking chemistry, after which it was time to take another weekend excursion, including:

Jericho—where Joshua caused the walls “to come tumblin’ down.” It was the site of a Rockefeller-sponsored archeological dig.

The Allenby Bridge—important in the 1948 war.

Qumran—where the Dead Sea Scrolls were found (1947) in earthenware jars in the caves and where the Essenes sect had lived.

Masada—the plateau-top fortress where a large band of Jews held out against the Romans for more than a year, finally committing mass suicide when the fortifications were breached by the Roman army, who had built a huge earthen ramp to the top of the cliff in order to carry out the final assault.

Back in the Hatechnion, we led a quiet life of chemistry, housekeeping, and further assimilation. We became part of the local scene to the extent that we entertained visitors, went to banquets for seminar speakers, and took short bus trips to places such as Caesarea, Copernaum, and the Mount of the Beatitudes. When we neared the end of our stay, there were farewell dinners. The best had been saved until last: a visit to Jerusalem where all history and religions come together. In the bright sunlight (you reached for your dark glasses but then realized that you had them on), the city was indeed “golden.” We hired a private guide so that we would not miss anything. We had an introduction to Teddy Kollak, the Mayor of Jerusalem, who showed us around the Shrine of the Book, where the Dead Sea Scrolls are kept, and we again experienced the feeling of living at a fast pace because of the many centuries and cultures that engulfed us.

Finally, Nell flew to Holland, I remained for a day of visiting and lecturing at the Hebrew University of Jerusalem, and then I too flew to Holland to join her and to be with family members. I have the feeling that I received much more than I gave, and I maintain visions vivid enough to last several lifetimes.

## ILLINOIS YEARS—1968-1975



N.J.L., University of Illinois, 1968

The sabbatical leave of 1967-1968 included some time spent at the University of Wisconsin collaborating with Professor Folke Skoog in Plant Physiology, followed by time with Dr. Lyman C. Craig at Rockefeller University, where I lived within the campus grounds. Both Nell and I shared in the Israel experience in the spring of 1968 while Ken was at the University of Illinois, Marcia was at the University of Wisconsin, James moved in with Andy Green's family, and Mrs. Krumins moved into our house to take care of David. David said that the food was wonderful but the supervision was a bit close.

### Family

Kenneth earned his first car in 1968 and spent the summer in Aspen, Colorado, where he lived in Hillside Lodge and worked as a house boy at the neighboring Blue Spruce Lodge. Both lodges have since been displaced by other construction. Unfortunately, he had car trouble on the way home and had to spend a week in York, Nebraska, waiting for parts and repair. In Chicago, which he reached at Democrat Convention time, he avoided the riots, but he drove on safely to Dunewood. During 1968-1970, he continued his study of design at the U. of I., the most identifying feature of which was the "all-nighter" projects. More notable at the University was the Student Strike for Peace. Also, Ken discovered the existence of a lectureship fund that had not been touched previously and he was able to host Buckminster Fuller on campus, who served as the centerpiece of a student teach-in on Conservation against Waste.

When Ken was about to graduate in 1970, his draft number was in a probable zone for Military Service. His well-established non-violent philosophy allowed him to perform Alternate Service, which he did at the Institute of American Indian Arts in Santa Fe. He had exchanged his little car for a more practical truck, and he lived on a ranch out in the country where he did fence repair and other chores to offset part of his rent. After two and one-third years of teaching all forms of art to his Native American students, he was free to continue his schooling, this time at Cal Arts, where he specialized in animation during 1972-1973 in a graduate program. From 1973 onwards, Ken worked in design and animation and lived in a number of places of gradually improving quality.

Marcia was continuing her study at the University of Wisconsin; however, during 1969-1970, she worked part-time as a salesperson in a dress shop while she tried to discern where her studies were leading her. The student riots at Wisconsin, which lead to practically daily tear gassing in the dormitory area and—when she lived in an apartment—the steady presence of National Guardsmen deployed in the neighborhood caused Marcia to decide that the University of Wisconsin was not the right college atmosphere for her. Her conclusion was fortified by the University's doubling of the tuition in an apparent attempt to get rid of all "out-of-state agitators." She wondered why she should spend more of Dad's money when she did not know what she wanted to study. We welcomed her back to Urbana, where she lived in a small apartment and had the use of our Volkswagen station wagon when she needed it.

At the University of Illinois, in discussion as to her academic future, Marcia had the good fortune to be guided by Associate Dean Fayerharm of the Liberal Arts and Sciences College, who had in place a 50-student experimental program wherein the honor student could design his/her own curriculum. Marcia decided on a program in children's literature, and outlined a series of courses that would occupy a year and a half, 1970-1972. The Dean was surprised and pleased with the program that started with child psychology and ended with the mechanics of publication because most students had designed elective curricula that enabled them to finish college early. Marcia's series took her into a fifth year, and she found it purposeful and enjoyable. To top it off, she registered for a summer course at Radcliffe on the publication process and was then ready for employment. Her first job was as an editorial assistant for "Cricket," a brand new children's literary magazine. The offices were in Peru, a small town in northern Illinois. Basically, she lived in Peru

during the week and drove to Urbana or Chicago on weekends in her first car, a Dodge Dart. She would even drive to Chicago (two hours) on a weekday evening for a concert, theater performance, or a decent meal. The car saw Marcia through her six years at “Cricket” and a Western tour thereafter.

As mentioned in the previous chapter, James was active in the “Tigers Den” Council, a long-standing, school-sanctioned committee that gave Urbana teenagers something to do on weekends. Their two-day rock festival in September, 1969, netted \$70,000 for the Den Council and enabled the Den to buy the City a fully movable stage for the Urbana Civic Center. Jim was not on-stage except as a “roadie” for his high school buddies in the band “Uncle Meat,” then “Ginger,” and finally “REO Speedwagon.” He traveled through Wyoming and Colorado in 1969 with Scott McNeil and was the first to see the Snowmass house while it was still under construction.

Uli Frauenfelder had spoken enthusiastically about life at the University of Washington while sharing ski lifts in Snowmass, and Jim enrolled there beginning in October, 1970, to study geography and urban planning. Late in his sophomore year, Jim’s draft number (19) was pulled, and since he had already been granted Conscientious Objector status, he had to find his Alternative Service. That led him to a job in Respiratory Therapy at Evanston Hospital where he replaced a family friend, Paul Scotten, who was just finishing his two-year turn as a C.O. When he worked and lived in Evanston, Jim inherited our old Pontiac as his first car. Jim stayed on for 2-1/2 years in order to sit for a certification exam, and once certified, quit and skied for nine weeks . . . four in Colorado with family and five more in Europe while touring on his own and visiting relatives. The Evanston experience influenced him to shift from urban geography to Health Services Administration when he returned to the University of Washington to complete his undergraduate work and to enter graduate school.

David played his drums during junior high and high school and took them to college, where he finally sold them in 1975. His interest in high school was mainly in getting out (3-1/2 years). He was just not involved in high school activities and so had little connection there. I employed him part-time as a laboratory assistant, but he obtained a better paying part-time job as a painter between 11<sup>th</sup> and 12<sup>th</sup> grades and then upon graduation. In the fall of 1971, he and I took a university-scouting trip. Landing in Albany, New York, we drove to Amherst (“Where are the buildings, Dad?”), the University of Massachusetts, which is also in Amherst (“Looks like a city”), Dartmouth (“Not my people, Dad”),

Middlebury (“Buildings?”), and, finally, the University of Vermont in Burlington (“Just right”). We toured the campus and the town of Burlington, where they were having a town-and-gown exhibition of crafts. Dave was impressed by the fact that there was only “one cop” in evidence as we moved about in the cheerful, jostling crowd. Dave had excellent grades and was accepted despite the fact that the University of Vermont had a low quota for out-of-state applicants. I like to think that I helped somewhat by writing a father’s ad hoc letter to a friend of mine on the admissions committee indicating that David’s forbears had settled in Vermont in the 17<sup>th</sup> century and that he was the “rugged individualist” in the family.

Out of high school in 1972, Dave went to Europe during April, May and June on money that he had saved. We were only allowed to supply the three-month rail ticket that he used to great advantage. He beat all records in traveling cheaply. Back in Vermont in the fall he entered the University of Vermont as a major in history, then shifted to math, and later in his sophomore year, to mass communications. He worked for their FM radio station, WRUV, during his sophomore, junior, and senior years, and was Station Manager during the last year. Skiing, one of the reasons he selected the school no doubt, was a regular weekend enjoyment. Between his sophomore and junior years, Dave hitchhiked to the State of Washington, where, with Sam Adams, he worked on a pea combine, bought a car for \$175, and proceeded to drive back across the country in five days to UVM. He met Helena Maria Barchiesi (Elena) in his junior year. She was to be a very important factor in his future.

Anticipating an empty nest, Nell and I, in 1971, bought a “replacement” Norwegian Elkhound. She was named Malu (officially “Malu fra Duneskoog”) by David, trained by Nell, and petted and walked by me—a wonderfully affectionate and responsive dog friend.

## Research

A new appointment greeted me upon our return from Israel: Professor of Chemistry and Member of the Center for Advanced Study at the University of Illinois, with a substantial raise in salary. Membership in the Center for Advanced Study carried with it the possibility of more frequent partial leaves for the pursuit of research as well as association with members from other disciplines for the selection of resident scholars and visiting scholars to the campus. In 1973, the title was extended to Professor of

Chemistry and Biochemistry in acknowledgment of the research that had been going on in my laboratory, and was continuing, on the synthesis and biochemistry of ribonucleosides, ribonucleotides, and coenzymes; spatial probes of enzymes and coenzymes; and spectroscopic models of coenzymes and base pairs. It was a time of great enthusiasm and productivity in our new quarters in Roger Adams Laboratory, and I was blessed with brilliant doctoral and postdoctoral colleagues, who had broad interest and were fun-loving.

We could conclude from a study of spectroscopic models related to the coenzyme nicotinamide adenine dinucleotide that the hypochromism observed for NAD<sup>+</sup>-type systems in aqueous solution is a function of both (a) conformation favorable for interaction between the N-substituted nicotinamide and the adenine and (b) proximity of the positive charge to the adenine ring system. Like models of dinucleotide phosphates, namely B-(CH<sub>2</sub>)<sub>3</sub>-B', had greater hypochromism in aqueous solution than their corresponding dinucleoside phosphates, indicating that the time-average separation of the bases in the analogs is less and is not influenced by hydrogen bonding. Thus, the analogs served as useful models for inferring the contribution of base-base interaction to the structural and spectral properties of nucleic acids. These studies were extended by emission spectroscopy in 1:1 ethylene glycol: water glass at about 77 Kelvin in collaboration with Terry Eisinger of Bell Laboratories and by photochemistry and X-ray analysis in collaboration with my Illinois colleague Ian Paul.

The reagent diethyl pyrocarbonate (DEP) was in general use for the inactivation of enzymes, e.g., ribonuclease, during the isolation of other factors, e.g., viruses. My Illinois colleague, Professor M. E. Reichmann, in the Department of Microbiology told me that tobacco mosaic virus (TMV) was inactivated either partially or completely, depending on the temperature, when DEP was employed during the preparation of the virus, and he asked whether we could determine what was causing the damage. We trisected the problem: first, establishing the structures of the products of the reaction of DEP with ribonucleosides; then, with dinucleoside monophosphates; and then, the order of enzymatic hydrolysis, if any occurred, of the DEP products of the latter. On the basis of the accumulated results, we could conclude that the reagent would serve the purpose of detecting adenosine or deoxyadenosine at exposed sites in an RNA or DNA and of initiating sequential analysis of a modified A at a spot in the molecule where enzymatic cleavage would not occur readily. We were gratified to learn

that other laboratories used our findings to establish (1) that DEP reacted with the terminal A in tRNA only when the A is unstacked; (2) preferential DEP modification of deoxyadenosine and deoxyguanosine in left-handed Z-DNA regions is diagnostic of that variant structure; (3) single-stranded loops of DNA cruciform structures can be detected by DEP reaction followed by cleavage with piperidine; and (4) similar methodology can be used for the footprinting of quinoxaline antibiotics binding to DNA and for intercalation-induced helix-unwinding locales in DNA.

From the chemical modification of nucleosides and nucleotides, it was a small step to modification that would render them fluorescent. However, I first had to be inspired by auditing a course on fluorescence given by my Illinois colleague Professor Gregorio Weber and to obtain research funding for the requisite apparatus. Then, by a stroke of good luck, Jorge Barrio appeared on the scene. Jorge had received a fellowship from his native Argentina to study abroad. Since his professor in Buenos Aires had studied with Roger Adams, Dr. Adams was his first choice of mentor, but Roger was no longer taking research students or postdoctorates. Jorge was therefore directed to me, and I described to him my research plan to render each of the natural nucleosides fluorescent. He liked the idea, but he answered that although he knew how to make a multitude of chemicals from toluene, he knew very little about heterocycles and nothing about fluorescence. Could I give him a month to learn all that was necessary before he went into the laboratory? Yes, indeed. He was tutored in fluorescence by Gregorio Weber, who was also a native of Argentina and who complained only about Jorge's over-eagerness. Gregorio amused me by saying, "Doesn't Jorge know that it took seven days to make the world?"

After a month of incubation, Jorge was deeply committed and, with the aid of my student Jack Secrist, succeeded in attaching a fluorescent label to 4-thiouracil and 4-thiouridines. They predicted enthusiastically that the product of the chemical modification of adenosine with chloroacetaldehyde in aqueous solution at room temperature, namely  $\epsilon$ -adenosine, should be fluorescent. Indeed, it was found to be fluorescent, with a long fluorescent lifetime, detectability at low concentration, and relatively long wavelength of excitation. The protonated form of the reaction product of cytidine with chloroacetaldehyde,  $\epsilon$ -cytidine, was also found to be fluorescent. There followed a flurry of research activity in our Laboratory as we coopted more graduate student and postdoctoral collaborators and teamed up

with other professors and their students, resulting in the following research applications, *inter alia*:

Fluorescent modification of ATP to  $\epsilon$ ATP and following its activity in representative enzyme systems.

Spray reagent for the detection of adenine-containing residues by fluorescence on thin-layer or paper chromatograms.

Fluorescent modification of adenosine 3',5'-monophosphate (cAMP) and its activity in protein kinase systems: work of Jack Secrist in Professor A.G. Gilman's laboratory (two weeks) at the University of Virginia. NB: Al Gilman later received the Nobel Prize (for other work!)

Conversion of NAD<sup>+</sup> to  $\epsilon$ NAD<sup>+</sup> for investigation by fluorescence yield and lifetime of intramolecular association and of intermolecular interaction and activity in dehydrogenase systems.

Dynamic and static quenching of fluorescence in flavin 1,*N*<sup>0</sup>-ethenoadenine dinucleotide (with Gregorio Weber).

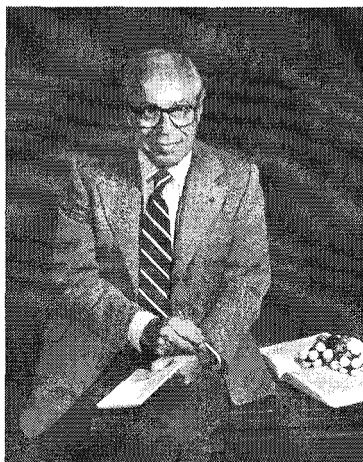
The role of  $\epsilon$ ATP and  $\epsilon$ AMP in firefly luciferase (with Professor William D. McElroy, University of California, San Diego).

Chloroacetaldehyde-modified dinucleoside phosphates: dynamic fluorescence quenching and quenching due to intramolecular complexation.

The equivalence of  $\epsilon$ CTP and ATP in certain enzyme reactions (with Professor Robert L. Switzer).

Comparison of  $\epsilon$ NCD<sup>+</sup> with the natural coenzyme NAD<sup>+</sup> in selected enzyme systems (with Professor Richard L. Gumpert).

Fluorescent photoaffinity labeling (with Professor Elkan R. Blout, Harvard University).



Elkan R. Blout, Photo: Karsh, Ottawa

It was impossible to keep up with all the potential applications. As the etheno compounds became available commercially (the University of Illinois garnered a small amount of patent royalties), and found wide utility, I adopted the less active role of reviewing the field about every ten years to cover DNA and tRNA structural diagnosis, carcinogen activation, enzyme-coenzyme interactions, and coenzyme binding to proteins. Our laboratory completed its contribution to the field of fluorescence modification of nucleic acid components with the establishment of structure of the products of guanine modification with substituted malondialdehydes.

During this period, Sidney M. Hecht was continuing the research on cytokinins. His output of work was prodigious as a graduate student. I had one file drawer for *his* research reports and one file drawer for those of my other young colleagues at the time. Sid spent his final Ph.D. year at Wisconsin on an Intra-Big-10 fellowship, whose existence he had discovered, and he stayed on at Wisconsin for a postdoctoral year, learning plant physiology from Folke Skoog, molecular biology from Robert Bock, and X-ray crystallography from Muttaiya Sundaralingam, and publishing with each of them. In collaboration, the Wisconsin-Illinois team isolated and established the structures of cytokinins from many transfer nucleic acid sources. Donald E. Bergstrom made an important contribution to tRNA structure by working out the photochemistry between 4-thiouracil with cytosine, two units that are held proximal, while Robert L. Cundall elucidated the course of stereochemically controlled photoreactions between two thymine rings, a combination important in the photodamaging

of DNA. Graham C. Walker, who had come to us from Carleton University, Ottawa, Canada, rapidly solved one problem in fluorescence and two problems in cytokinin activity. His interest moved to biochemistry, so I agreed with his shifting to research with my colleague Olke Uhlenbeck, with whom Graham published two papers and thus wrote a two-part Ph.D. thesis. He livened our seminars by his comic drawings announcing each occasion. These young colleagues and others supplied me with sufficient lecturable material to accept invitations from France, England, the Netherlands, Poland, and the USSR (Ukraine), and I enjoyed a partial leave in the Center for Advanced Study.

Within this period, the years 1968-1972 had been difficult teaching years. From time to time, the students asked me to stop teaching in protest of the continuing Vietnam War, but I indicated that I could not do that because I was under contract to teach. However, I could tell them that I opposed the United States' involvement, that I had two boys who were conscientious objectors, and that I would support the students' nonviolent opposition. If they did not wish to attend my lectures, or if they walked out of them, I would understand. I would supply them with typed lecture notes for any lecture that they missed. No, I could not excuse them from taking a quiz or final exam, but I would grade them on the number of quizzes that they took in addition to the final exam. They appeared to appreciate my attitude even though they were disappointed, and I was not heckled or criticized in the student press. The University of Illinois fared better during this period than did the University of Wisconsin, where the protests extended to bombing.

## ILLINOIS YEARS—1975-1986

The beginning of the final period of my appointment at the University of Illinois had no particular marker other than that the “family” at 606 West Indiana Avenue consisted of Nell, Malu, and me. Ken, Marcia, Jim and David were on their own; they will have to tell their stories at some other time. Malu, a purebred Norwegian elkhound, had been obtained in 1971 and had been named by David. When she was mature enough, she had been bred to a champion male (“King”) when we were in Snowmass Village. Eight puppies had been born (“A”—“H”), and she practically exhausted herself feeding them. Even when we gave them supplementary milk, Malu insisted on making a major contribution and would seek out each one of them to nurse, no matter whether we would make-believe hide one. Her motherly instinct was most impressive. Nell had taken Malu through several training programs, with the result that she was satisfactorily obedient and responded to conversational directions. She gave us affection, play and companionship as long as she was with us, and she enjoyed her three houses: Urbana, Manistee, and Snowmass Village. While the puppies were developing, they lived on our screened-in porch where they had a house, a litter box, and large play area. When I came home from the laboratory, I would arrive by the porch door, settle down in the stairwell, and say, “Time for loving.” At that signal, they would swarm into my arms and roly-poly all over me. It was a joyous experience. When A-H, each with a different personality, had had their shots, registration as purebreds, and had reached about four months of age, Nell sold them to carefully selected buyers. With the proceeds, she bought an airline ticket to accompany me on a chemistry trip to Europe. That was her wish and decision.



There were other trips derived from chemistry which we could enjoy

A mature Malu, deep in thought, Snowmass

together now that the children were away from home. While the major events are covered in separate sections that appear later, several that occurred during the 1975-1986 period are worthy of mention at this stage in the writing. In 1975, I received the Edgar Fahs Smith Award of the Philadelphia Section of the American Chemical Society and the University of Pennsylvania and gave the required Memorial Lecture. Edgar Smith had been one of the founders of *Chemical Abstracts*. Privately, I believe that the award selection might have had something to do with three of my former students having been important members of that A.C.S. Section. In any case, the banquet was a highly agreeable social occasion, with all the wives in attendance. Nell had been treated to a tour of Philadelphia's historic sites and museums during the day, and she did not have to listen to my lecture that afternoon.

When I was inducted into foreign membership of the Polish Academy of Science in 1977, we did not have to journey to Poland, but only to Chicago, where a brief ceremony at the Polish Consulate accomplished the process. The staff members of the consulate appeared pleased when Nell and I accepted their invitation to a celebratory meal at Ambassador West, one of Chicago's famous restaurants. They seemed equally pleased when we accepted their further invitation to have a few drinks before the meal. We surmised that staff members of the Consulate were perhaps not always accorded the honor of participating in such banqueting. On this occasion the Consul had excused himself because of other commitments. I must say that we were all in a very happy and friendly mood as the meal progressed.

Those words also describe our feelings when Nell and I attended the Fifth Symposium on the Chemistry of Nucleic Acid Components that was held at Bechyně Castle in Czechoslovakia (Bohemia) in September of 1981. Looking through the correspondence with the late Jiri Beránek, who was the organizer of the symposium, I find that each of us was aware of the purpose of the symposium: to bring Czech students and internationally known professors together in a congenial and beautiful setting. Please recall that Czechoslovakia was still a Communist country, although it was not nearly as restrictive as it had been at the time of my first visit in 1962. I was being offered some special treatment because I had been one of the originators of that particular symposium series. Nell and I settled for a night of rest and a pre-symposium walking tour of Prague. Pertinent excerpts of my letter of March 31, 1981, to Jiri Beránek follow:

*"Thank you, also, for explaining the philosophy of the meeting that encourages participation of as many young people as possible, which I strongly endorse. I will be happy to be a part of it, and please do not give me more time than you give the others whom you have invited.*

## MORE THAN A MEMOIR

*"I am pleased that you are willing to make my wife a participant in the meeting so that she can accompany me."*

I also indicated that I would prepare a ready-for-print manuscript and would send in the symposium fee. Jiri's reply in the next month indicated that I had caught the intended spirit of the Symposium.

*"Your generosity and understanding of our efforts and organizing work are very much appreciated."*

We thoroughly enjoyed the Symposium at Bechyně Castle in all its aspects: the daily chemical discussions, seeing international friends and colleagues each day, and seeing new scenery that we had not imagined that we would ever see. There were bus tours to attractive locations in Bohemia. Nell was very happy to find that there were many wives in attendance, two-thirds of whom she knew from Australia, Switzerland, France, Germany, and the United States. We returned home via the Netherlands, where we could visit with all of the Dutch families.

We caught up with our Western U.S. families in June of 1982 after a trip across the U.S. and Canada in our old Buick via a route that treated us to the National Parks: Snowmass Village, CO - Denver - Craig, CO - Jackson Lake, WY - Colter Bay - Yellowstone (Old Faithful Inn) - Yellowstone (Mammoth Hot Springs Hotel) - Whitefish, Montana - Glacier-Waterton Lakes Park (Prince of Wales Hotel, Canada) - Banff, Alberta - Kamloops, British Columbia - Vancouver - Seattle. There, in Seattle, we visited David and Elena and James and Patty plus Corinne, who had been born when we were in Yellowstone. For the return, we dropped down to Oregon, traversed Idaho into Utah and Western Colorado, through Denver and then home via our well-practiced route. The car was still holding together after the 6000-mile journey. There were no chemistry lecture-stops on that tightly scheduled trip. The substitute was a greatly enhanced appreciation of Nature and the wonder of a third generation on the way.

In 1984, I began attending symposia in honor of chemists of my own generation. I was together with my good friends, the late Stan Tarbell of Vanderbilt University at a Symposium in Honor of Professor Norman H. Cromwell, University of Nebraska-Lincoln, and Stan wrote to me (May 25, 1984) after the Symposium:

*"While I was listening to the presentation of your elegant work, I recalled how we heard Art Cope's talk at the Marvel Symposium in Tucson in 1961. Art was talking about his work on some nitrogen rearrangements; we looked at each other and said almost together,*

*'This is really beautiful,' and it was. I'm not sure that all of your audience at Lincoln quite appreciated what they were hearing, although Chris Michejda did.'*

From a usually reticent New Englander (Stan), this was high praise indeed. By way of explanation, Chris had been at the University of Rochester (Stan's former location) and the University of Illinois.



Josef (Gus) Fried

Also, in 1984, I attended and spoke at a Symposium Honoring Professor Josef Fried at the University of Chicago. Gus Fried, Elkan Blout, and I formed our long-lasting friendship triumvirate when we were graduate students at Columbia University. Bristol-Meyers Squibb and the University of Chicago launched in 1990 the first of a series of *annual* Josef Fried Symposia of Bioorganic Chemistry. Elkan Blout was also honored at a Symposium commemorating his 65<sup>th</sup> birthday at the Harvard Medical School in Boston, and a Symposium Tribute to Stanley Cristol of the University of Colorado, Boulder took place in 1985. These were all such good friends that I

enjoyed participating in their symposia and adding a few personal comments to each of my invited lectures. The year 1985 was also the time of an unusual event, namely, my induction into the Mount Vernon High Schools Hall of Fame. Marcia and Tom very kindly chauffeured us when Nell and I presented ourselves on that occasion. The now-unified high schools are in the northeast corner of the city. When Morton Sultzer, my old friend and mentor, was on the Mount Vernon School Board, he convinced the other members and the city government that expansions at the old sites were impossible and that the Wartburg Estate was the only location on which to build the combined high schools, previously named A.B. Davis and Edison (the technical high school). The only deficit, i.e., bussing to the distant location, became a positive factor when bussing became a legally mandated requirement for all high schools. I thought of Morton Sultzer and of all the excellent teachers I had had, and of special friends from those years (1930-1933), during the induction ceremony, which was conducted in an appropriately friendly but formal manner. The original estate possessed a lake on which we had played a pick-up form of ice hockey when we were growing up.

## Research

It takes time for some discoveries to be recognized or appreciated, especially if a scientist moves from one field of endeavor to another. However, any recognition or appreciation is always welcome. When Nell and I journeyed to Lyon, France, in 1984, where I was a participant in the conference on ‘Role of Cyclic Nucleic Acid Adducts in Carcinogenesis/Mutagenesis’ at the International Agency for Research on Cancer, it was good to hear Helmut Bartsch say in his keynote address that “the real renaissance of cyclic nucleic base adducts began in 1972” with our work. Concerning the field of cytokinin discovery and research, one finds in the obituary of Folke K. Skoog (1908-2001) that appeared in the *Plant Molecular Biology Reporter* [19, 109-112 (2001)] the following statement:

**“For more than 20 years, Skoog’s group also collaborated with Nelson J. Leonard, a chemist at the University of Illinois, in synthesizing and testing hundreds of possible cytokinins and antagonists, and in establishing the principles governing their structure-activity relationships.”**

The period of time mentioned actually included the years 1962-1984. Local recognition (monetary) occurred again in a new Illinois title for the period 1981-1986: Reynold C. Fuson Professor of Chemistry, Professor of Biochemistry, and Member, Center for Advanced Study, University of Illinois at Urbana-Champaign. Moreover, I was able to relax my teaching to half-time in my final semester before retirement by a “leave” for the other half into the Center. Coming late in my career, but nevertheless well appreciated, were Awards for Excellence in Teaching, 1980 and 1984, given by the School of Chemical Sciences, University of Illinois. I had finally found out—after 40 years—how to teach! Jim Leonard voiced the opinion that those two awards were the most important of the many good things that had come my way during long years of teaching and research.

How and when do novel research ideas occur to the scientist? In the case of this scientist, the sources of inspiration ran the gamut of possibilities. Spatial probes for adenine, adenosine, and adenosine phosphates had been developed from a 3-substituted adenine that was found in nature. Fluorescent probes for nucleic acid bases and their phosphate derivatives had been developed as part of an initial purpose to render all of the natural

nucleosides fluorescent, as I have already discussed. In fluorescent ATP and its congeners, the N1 hydrogen acceptor and N<sup>6</sup>-hydrogen donor positions are blocked. Because these positions may be involved in enzyme or protein interactions in some systems, I felt I had to devise an improved type of probe in which analogous loci would remain free while the property of fluorescence would be retained by the inclusion of a third ring in the adenine system. "Why not try a central 'benzo' ring between the terminal pyrimidine and imidazole rings?" The idea occurred to me while I was shaving one morning. I had to ask my image in the mirror: "Why haven't you thought of that before? You have had all of the separate bits of information available for two years or more and yet you haven't put it all together until this moment." The image in the mirror was chagrined; however, it was not too late. No one else had as yet conceived of the idea. The answer was found in the *linear*-benzoadenine series.

The fact that the new, nitrogen-containing ring system had to be synthesized *de novo*, which was done first by Alan Morrice and Dr. Mark Sprecker (publication in 1975), along with two angular benzoadenines, gave us some respite so that we could do ample experimentation before the compounds would have any off-the-shelf availability. We shortened the synthetic methodology for the *lin*-benzopurines in general and made the desired ribosyl and phosphoribosyl derivatives. Armed with the knowledge of the similarity in behavior of *lin*-benzo-ATP and ATP with a representative group of kinases and convinced of the desirability of relating the nucleotide names, I approached Dr. Waldo E. Cohn for approval of the nomenclature. Waldo was the "czar" of biochemical nomenclature. It took some argumentation, but the conviviality of a summer Gordon Research Conference in New Hampshire helped in gaining his imprimatur. Research on the fluorescent dimensional probes moved forward at a brisk pace at the University of Illinois when Dr. Jorge R. Barrio returned to us from an interim teaching position in his native Argentina where dangerous political fracturing of the country was in progress. We found usefulness in the fluorescence properties of the *lin*-benzoadenine nucleotides in studies of static and dynamic behavior, which yielded information concerning coenzyme-enzyme binding sites. Another postdoctorate, David I.C. Scopes, who joined the group had an interesting background in that he had most recently worked with Gus Fried's younger brother, John, at the Syntex Corporation in California. I found willing collaborators in other laboratories as I had during our investigation of the etheno-bridged probes.

Evaluation of the fluorescent, dimensional probes: *lin*-benzoadenosine 5'-triphosphate, 5'-diphosphate, and 3',5'-

monophosphate with respect to binding and activity as enzyme cofactors.

The fluorescent “stretched-out” analogs, *lin*-benzoadenosine and *lin*-benzoadenosine 3',5'-monophosphate, are able to interact with AMF-dependent protein kinase, a pivotal enzyme involved in many hormonal responses (with Dr. M. J. Schmidt, Eli Lilly and Company).

Interaction of *lin*-benzoadenosine 5'-di- and triphosphate with mitochondrial ATP synthetase, purified ATPase, and the adenine nucleotide carrier (with Henry A. Lardy, University of Wisconsin).

Incorporation of modified nucleoside 3',5'-biphosphates into oligoribonucleotides with <sup>14</sup>C RNA ligase (with Professor Olke C. Uhlenbeck).

Utility of the spectroscopic responses of *lin*-benzoadenine nucleotides for determining divalent metal ion association constants and interaction with positively charged micelles and with representative enzymes.

Allosteric activation of aspartate transcarbamylase with *lin*-benzo-ATP.

Dimensional probing of the ATP binding site on firefly luciferase (with Dr. Marlene DaLuca, University of California, San Diego).

A fluorescence displacement titration technique for characterizing the nucleotide binding site on the catalytic subunit of protein kinases (with Dr. R. Roskowski, Jr., Louisiana State University Medical Center).

All of these findings seemed to have been hoped for in the blurb that appeared under “Monitor” in the *New Scientist* of January 25, 1979, a portion of which follows.

“Detailed pictures of the active sites of many enzymes, even when they have not been crystallized and studied by

X-ray diffraction, may come out of some beautiful synthetic chemistry by Nelson Leonard, Jorge Barrio, and their colleagues at the University of Illinois . . . In its most recent researches, Leonard's group has made and studied analogues of the adenine nucleotides which are longer by about 2.4 Ångstroms than the natural compounds. These lin-benzoadenosine derivatives retain all the features of the natural molecules but they contain an additional internal benzene ring; the Illinois group regards them as 'dimensional probes' of active sites. Since so many biochemical processes involve ATP, NAD, cyclic AMP and related compounds, this series of molecules can be used to study an immense range of enzymes. They are also fluorescent, so their fluorescence emission conveys information about the sites to which they are bound.

"But the real power of this approach is demonstrated by its application for the synthesis of ATP in mitochondria, the main system for the conservation of energy in cells. At present we have no information about active sites in this system. The analogue approach has been tried in the past, but in most cases the analogues used have been synthesized directly from ADP or ATP and the possibility of contamination of the analogues with free ATP or ADP has made the results difficult to interpret. Because of their route of synthesis, Leonard's lin-benzoadenosine derivatives are absolutely guaranteed free of such contaminants."

The underlying concept has been effective in assessment of the space available for the adenine portion of adenosine triphosphate (ATP) with various enzymes and transport proteins. The importance of the problem lies in the fact that fully one-sixth of all presently known enzymes require ATP as a substrate or cofactor. The fluorescence properties of the coenzyme analogues have also been used to define limiting equilibria between stacked and unfolded conformations of these alone and in contact with their receptor proteins. We made other compounds containing a fused benzene ring in the center, including benzologs of enzyme inhibitors.

In work going on elsewhere, the original concept has been followed and has also been altered by formal scission of the benzene ring to create analogues that possess terminal pyrimidine and imidazole rings, or other

heterocyclic ring pairs, with different tethers between the rings. The interest in these analogues lies, *inter alia*, in their potentiality as anti-cancer drugs. In designing and synthesizing these “split” nucleoside analogs, Katherine L. Seley of the Georgia Institute of Technology, in particular, has been most appreciative of our “pioneering work” in the *lin*-benzo series. She introduced a new class of shape-modified nucleosides which she refers to as “fleximers.” Others who derived initial guidance from our work, according to their publications, include my friends Stewart Schneller and Vasu Nair.

At one of the Aspenyl Chemistry Meetings in Snowmass, Jack Roberts’ description of his pathfinding work on  $^{15}\text{N}$  NMR and my contributions to nucleic acid chemistry led to a decision to collaborate in an analysis of 5-azacytidine  $^{15}\text{N}$  resonances in neutral and protonated form. In another year and after a number of downhill runs and ski-lift rides together, we collaborated in a study of the tautomers and locus of protonation of adenine and its derivatives by  $^{15}\text{N}$  NMR spectroscopy. This was followed by our synthesis of (+)-[1- $^{15}\text{N}$ ]biotin, which led to the assignments of the  $^{15}\text{N}$  NMR resonances of biotin, thereby providing another probe for following the biological carboxylation and transcarboxylation of biotin and for investigating the phenomenal interaction between biotin and avidin. The final collaborative paper was concerned with the  $^{15}\text{N}$  NMR assignments in a systematic series of azacycl[3.3.3]azines of varying nitrogen content. Years later, at a dinner in Pasadena, CA, to celebrate Jack Roberts’ 70<sup>th</sup> birthday, I had the pleasure of describing his contributions to chemistry, universities, foundations, and friends. When I mentioned that I could probably pinpoint his four major contributions to science as being our collaborative papers, the audience groaned, appreciating the hyperbole. On that occasion, Jack and Edith Roberts introduced me to one Peggy Phelps, whom I was to marry in 1992.

One of the azacycl[3.3.3]azines we made, named tri-*s*-triazine (and, earlier, cyamelurine), was of particular theoretical interest. The unsubstituted nucleus was common to some heat-stable compounds that had been made in Germany more than 150 years earlier and to which Linus Pauling had assigned the three-fused-rings structure. The physical and spectroscopic properties and the structure, established by x-ray crystallography, satisfied most of the theoretical predictions related to the  $12\pi$ -electron periphery of tri-*s*-triazine. Our communication elicited a letter from Linus Pauling, reproduced here, which had a very stimulating effect on my young coworkers, Mitchell Rossman and Dr. Ram Hosmane.

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5 November 1982

Professor N. J. Leonard  
School of Chemical Sciences  
University of Illinois  
470B Roger Adams Laboratory  
1209 West California Street  
Urbana, IL 61801

Dear Professor Leonard:

I am surely pleased that you have succeeded in synthesizing the compound cyamelurine.

I must say that I was also pleased, nearly 50 years ago, when I realized that I had thought of a sensible structure for cyameluric acid and hydromelonic acid. Professor Franklin at Stanford had given me nicely crystallized samples of some of the compounds, and I had been trying to think of a sensible structure - the ones that he had written for the compounds and that other early chemists had written did not seem to me to be sensible.

Sincerely,



LP:dm

Our two-step synthesis of tri-*s*-triazine was particularly satisfying to me because I knew that many others had tried to make it and had failed. Furthermore, I had suggested to Mitchell and Ram the successful conditions for carrying out the second step. They enjoyed teasing me about this, saying something to the effect: "We tried your idea, *but* it worked!" We were lucky in those years to be blessed with both success and good humor in the laboratory. The cooperative spirit of my research

colleagues, tempered by much kidding along with competition, endowed this period with special pleasure.

We achieved entry into another N-heterocyclic system via a remarkably simple two-step procedure. Ken Cruickshank, a bagpipe player from Scotland, and Kunihiro Sumoto, from Japan, showed us how to achieve access to the rare  $10\pi$  1,3,4,6-tetraazapentalene ring system, which opened a final, major chapter of research on covalently linked DNA/RNA cross sections.

In the spring semester, 1986, my organic chemistry colleagues at the U. of I. invited a series of speakers, who appeared almost every week on the campus, to talk about their research. They were a carefully selected group: all were former students and postdoctorates or close friends who had connections with Illinois. I greatly appreciated and thoroughly enjoyed the thoughtful gift, presaging my retirement.

## SABBATICAL LEAVE, INDONESIA AND JAPAN, 1978

An invitation from Professor Tozo Fujii, my former postdoctorate who had become Professor at Kanazawa University, to spend a period as visiting professor at his university allowed Nell and me to plan a prior visit to Indonesia. We broke the outgoing trip with a stop in Waikiki, Hawaii, where we stayed at the Hyatt Regency Hotel and toured the island by limousine. Flying on to Jakarta on Java, Indonesia, we stayed with Nell's sister Hilda and her husband Paul Renardel de Lavalette at the Netherlands Embassy, where he was the resident Ambassador. We had a privileged tour of Jakarta that included a visit, but only passing by, to the house of Nell's grandfather Jan Dinger, where she had lived following her first five years in Shanghai, China. Her mother's father was in the long line of the Dutch who had set up the major banking system on Java. The large colonial mansion had been divided into many apartments when, following the departure of the Japanese invaders, Indonesia had become free. The harbor of Jakarta was a bustling port, with small ships of all variety used for inter-island commerce. Memorable also were the rice paddies, the carts pulled by water buffalo, and the bananas. There was also an ambassador's house in the mountains, Puncak, where Paul and Hilda could escape the heat from time to time. When I dove into the small swimming pool there, all the little geckos jumped out. Then these lizards scrambled back into the pool when I climbed out. It was obviously a kind of mutual ownership arrangement.

The Javanese food was varied and delicious, even if somewhat unsettling at times, and we appreciated the siestas after lunch, when the temperature and humidity outside were too challenging. Nell and I took a separate trip to Jogjakarta, where a guided, all-day tour included the Prambanam Temple, Sultan's Palace, a batik factory, and Burubudur and famous Buddhist temples. Hilda joined us then on Bali, which the natives speak of as being the origin of sunrise of the world. Beaches (Sanur, Kuta), dances (Gabor, Kechak, Legong, and Baris), and a holy spring (Tirta Ampul) occupied our attention, and we enjoyed the quiet luxury of the Bali Hyatt

Hotel. When we were all back in Jakarta, we tried to obtain an impression as to what the other Indonesian islands would be like with a visit to Taman Mini, where imitation villages on display represent the architecture and life style of each of the islands. It is pasteurized tourism at its best.

Our departure from Jakarta via Hong Kong to Tokyo was exquisitely timed for the passage of a typhoon through the travel area. Garuda Airlines, the national airlines of Indonesia, merely transferred all the passengers from a canceled flight to the next one, with priority over those scheduled on the second (or third) flight. While most of the Western would-be passengers responded by adding to the confusion, retrieving and rechecking luggage, going in and out behind the departure desk, and, in general, shouting about how the airline (not the typhoon, of course) was affecting their lives and businesses. I decided upon a more Eastern approach of patience and passivity. Sure enough, after three or four hours of my standing quietly by the desk, Nell and I were given the last two seats on a plane. We were bound for Hong Kong in the turbulent air that follows a typhoon. In Hong Kong, we were transferred to a flight on Singapore Airlines. The employees charmed us into forgetting the typhoon and further delay. We arrived at Narita Airport, Tokyo, after midnight, and transferred, without luggage, to the city terminal. We were supposed to be met by Professor Takeo Sato of Tokyo Metropolitan University, but we were hours late. (He had been a postdoctoral research associate in my laboratory.) Nevertheless, there was Takeo, smiling broadly and cheerily saying hello, when we came down the escalator into the air terminal in Tokyo. How did he know when or how we would arrive? There was no opportunity for communication. He had logically assumed that, under the circumstances, we would simply take the first plane we could from Hong Kong to Tokyo, and he was prepared to stand there until we arrived. Takeo died in May, 2000. I wrote to his widow that I had never been as happy to see anyone in my life as I was to see Takeo that early morning in Tokyo. On October 15, 1978, then, Takeo made arrangements for our luggage, on whatever flight it might arrive, to be delivered to our room at the Hotel Okura, where he dropped us off for our still-guaranteed reservation. A bellboy knocked on our door at about 5:00 a.m., bringing the luggage, much to my relief. I say "my" relief because Nell had entrusted her worry to me and was sleeping peacefully. Takeo drove us all around Tokyo after a late breakfast, which was a special treat for Nell because it was her first time in Japan since she was four years old. There was no bill to pay when we checked out of the Okura Hotel. Takeo and Michinori Ōki had taken care of it.

My stay in Japan was sponsored by the Japan Society for the Promotion of Science, and they provided a stipend, travel expenses, and an allowance

for my wife, all very generous. Our first stop on the tour was to be Kanazawa, and Tozo Fujii journeyed from there all the way to Tokyo to be our guide and escort on October 16. The limited express from Ueno Station took us through the Japan "Alps" on a seven-hour scenic ride to the western coast. We decided to stay in a hotel for the first five nights (Kanazawa New Grand), while we were becoming accustomed to the city, and then to stay in a Japanese inn (Kaikan Kaga) for a more indigenous experience during the remaining 13 nights. Tozo's wife Keiko guided Nell around the city so that she would be familiar with transportation and shopping, and the ladies also visited kindergarten and schools and even a dress rehearsal for a Noh play. It is so unusual for a Western person to be interested in the traditional Noh Theater that Nell was interviewed by the local newspaper for her impression of the whole lengthy performance. I gave three talks in Kanazawa, one of them on October 18 at the 11<sup>th</sup> Congress of Heterocyclic Chemistry. Outside the halls where the lectures were held was a plinth bearing the bronze figure of an American bison. I remembered it well, because I still had it clearly in mind when I learned, probably by 1991, that it had been sculpted by Peggy's mother and had been donated to Kanazawa by the Mayor of Buffalo, New York, its sister city in the United States. Small world! Back in October of 1978, I gave two lectures at Kanazawa University, one sponsored by the Hokuriku Branch of the Pharmaceutical Society of Japan and the other a seminar in the Faculty of Pharmaceutical Sciences of the University. I walked to the laboratory early each morning, when we were staying at the New Grand Hotel, by a route that took me through the beautiful Kenroku-en Garden, considered to be one of the most classic gardens in Japan. It amused me that the regular denizens of the garden were daily so surprised to see a Westerner, especially one who seemed to appreciate their favorite surroundings. In fact, Kanazawa had so few Westerners that Nell and I tended to greet them and to start a conversation when we would see other Westerners on the street. We smiled a lot in return for the smiles that the surprised local inhabitants bestowed upon us.

There was much to do and see when Tozo and I were not discussing research: an aquarium, an Edo Village of the 1608-1867 period, a Buddhist temple given by the King of Siam, and the nearby villages and mountains. Tozo and I practiced golf swings at one of the driving ranges ubiquitous in Japan, and Nell, Tozo, and I played a round of golf at the Toyama Country club, where Tozo's brother was a member. That was a very special mountainside experience. The golf pro walked us through the first hole, probably out of hospitality or politeness, but possibly also to determine whether the foreigners were going to chop up his course. I was lucky to

make a par on the first hole, and Nell was only one or two strokes above, so the pro waved us on enthusiastically to the second hole. The rest of our game was close to disastrous, and we heard a lot of "Too bad, O.B." from our lady caddy. Indeed, our scores were ruined by the many shots out-of-bounds, but those did not prevent us from having a good time at a favorite but exclusive Japanese pastime. The most special Kanazawa experience was a drive up one side and down the other side of the Noto Peninsula with the Fujii's. This territory is noted for an abundance of Buddhist temples and for factories making lacquered furniture. The details of our further travel and of my speaking engagements are to be found in a copy of my report to the JSPS, delivered on November 15, the day of our departure from Tokyo for home. What follows is a more personal account of the rest of our month in Japan, with stress on people, experiences, and impressions.

As any traveler to Japan has experienced, Japanese friends and hosts are most solicitous concerning departures and arrivals and even travel in between. It may be a custom that has descended from earlier times when the importance of a traveler was indicated by the size of his retinue. In our case, Tozo Fujii had journeyed to Tokyo to accompany us back to Kanazawa. When we traveled by bullet train from Kanazawa to Hiroshima, we were met by another of my postdoctorates, Fumio Toda, who then accompanied us to Ube, in the Kansai district. My lecture at Ube Industries provided the means whereby the three of us could stay overnight in their guest house and then transfer by rail, Ogori to Yanai, and taxi to the ferryboat that would take us across the Inland Sea to the island of Shikoku. Luckily for Nell, the sea was calm. Incidentally, there is now a spectacularly beautiful bridge, Seto-Ohashi, joining Honshu and Shikoku with both auto and rail traffic. The attractions were Ehime University in Matsuyama, the mountains and sea coast of Shikoku, Fumio's house, where we had dinner, a museum of an archeological site where there were objects 6,000 to 12,000 years old, and a tangerine orchard on the small island of Omishima. Nell and I also tried our hands at forming vases in a famous ceramics factory. We flew from Matsuyama to Osaka, where we stayed in the Royal Hotel and where I visited two pharmaceutical firms. My former postdoctorate Ichizo Inoue was our host at the Tanabe Seiyaku Company on the first day, and my old friend Dr. Ken'ichi Takeda, Director of the Shionogi Research Laboratory, was our host on the second day. One must be prepared to banquet on a lecture tour of Japan, and our November tour was no exception. The Takeda-hosted dinner party at the Restaurant Tsuruya in Osaka was the most aesthetic culinary highlight of our trip. I have never experienced a more beautifully prepared and served meal.

In Osaka, Minou Park was notable for the color of the maple leaves. Our next stop, Nara, was notable for the deer that populated the park, which we traversed in a very soft drizzle, adding atmosphere to the setting. We had an interesting experience at Nara Hotel. As we entered the hotel, climbed the wide stairway, and walked along the second floor corridor, Nell had a strong feeling of having stayed there when she was a child of four or five. She said she expected to find a broom closet at the end of the hall, and there it was! She remembered being put temporarily in that broom closet by the hotel manager to discourage her from running up and down the hall. We found that the hotel had been built in 1909, so the timing could be accommodated. When we checked with my father-in-law in a subsequent exchange of airmail letters, he confirmed that the Nara Hotel was indeed the place they had stayed on a visit from Shanghai, where he was an officer in a bank, to Japan in the early 1920s. Nell had always felt that goats had taken her bread in the park when she was a little girl. In 1978, she could now realize that they were deer and that she was supposed to feed them. The deer were very polite; as Japanese deer, they bow to you.

In Kyoto, where we stayed at the Miyako Hotel, Hajime Iwamura and his wife were our hosts. The visit to Nijo Palace was memorable, as were visits to the many temples and to the Handicraft Center (gifts to take home). The gardens of the Katsura Imperial Villa can be visited by Japanese only if they are in the company of foreigners and only if they apply for a date and time months in advance. It was the first visit for Hajime, who is a native of Kyoto. The perfection of the gardens has to be seen to be believed. Even photographs cannot provide the formal balance and meaning of every view. It is a total tribute to precious, fragile, natural beauty manipulated by man.

A Kodama (shadow) bullet train took us to Shizuoka, where Professors Minoru Sekiya and Keiicho Ito (later of Hokkaido Institute of Pharmaceutical Sciences) were our hosts. We toured round the vast, sloping sides of Mount Fuji and stayed the night in Hotel Mount Fuji in Yamanaka. Is the beautiful Mount Fuji always shrouded in clouds? We saw it under cloudless conditions at sunrise. The splendor of that volcano is etched forever in my memory, as we saw it from our bedroom window and then from the garden of the hotel.

It was then back to Tokyo, where we stayed at the Hotel New Japan (which later had a disastrous fire). I lectured at the Faculty of Pharmaceutical Sciences of the University of Tokyo, where Masaji Ohno was my host. He had been a postdoctorate with Professor E.J. Corey at the University of Illinois and had accompanied him to Harvard University

in 1960. My 1953 colleague, Professor Takeshi Hashizume, was my host for a lecture at Tokyo University of Agriculture and Technology. Dr. Issei Iwai of Sankyo Company gave us a complete tempura luncheon and guided us in camera shopping. Takeo Sato appeared again to help us do more sightseeing and shopping, and we visited the University of Tokyo, hosted by Kyoshi Mutai and Michinori Ōki. Nell felt the need of a visit to a church on November 12, our last Sunday, as a result of which she had the company of several new “old” friends on Monday. Sunday afternoon was special and included a wonderful time in the Ōkis’ home with their daughters and friends. Fusae’s art teacher also taught Nell a few fundamentals of charcoal drawing.

The final get-together was impressive. The Hashizumes, Ōkis, Satos, Iwamuras, Mutais, and Tozo Fujii assembled for a departing banquet at Totenko, near the Ueno Station. Gifts, of course, were exchanged, and we benefitted from the advice that Michinori gave us as to what was appropriate from our side. Our last vision of friends on the next day was of the smiles on their faces as we disappeared up the escalator in the Tokyo Air Terminal. Were they smiles of relief?—no, I do not think so; rather, affection. On a final note about the transport home, it is wise to book an “all coach” flight and to ask for seats near the front. If the seat configuration has not been changed, the forward seats will be equivalent to business class. We were lucky.

# LOUISE CORNELIE VERMEY LEONARD

July 16, 1919-January 25, 1987

The female line leading to Louise Cornelia (Nell) Vermey was composed of exceptional women, strong in character, believers in equality, and supporters of the poor and disadvantaged, including orphans. Our record comes from a chart that was given to Nell and me in 1960 when we visited a distant relative who lived in the province of Drente in the Netherlands and was interested in genealogy.



Nell's grandmother, Elisabeth Van Polanen Patel



Nell's grandfather, Jan Dinger

Elizabets van Polanen Patel, Nell's grandmother, married Jan Dinger in 1876. He was in trading, banking, and investing and was in the direct line of the Dinger family who had founded banking in the Dutch East Indies. They had nine children, of whom #4 was Nell's namesake, Louise Cornelia Dinger. She never married, but she adopted a son, the only white

## MORE THAN A MEMOIR

baby in an orphanage that she visited, and she raised him in East Java. She was her father's right-hand woman in administration and investments. During the Second World War, she died in a Japanese concentration camp. Carolien (Lien), who was #7 in the Dinger family, was trained as an x-ray assistant and was a formidable lady. Interned in West Java during the War, she stood up to the Japanese, guarded the medicines, and looked after the supplies for the children. Lien survived the ordeal of the concentration camp, came to the Netherlands after the War, and eventually came to live with Nell's mother, Annie. I saw Tante Lien first in 1953 and every time we came to Holland after that. She was most generous to her surviving nieces and nephews, and she helped us purchase one of our Michigan houses.



Nell's Father, Henri Jacques Vermey



Nell's mother, Anna Theodora Caesirina Dinger,  
ca. 1937

Anna Theodora Julie Cesarine (Annie) was born in Batavia (now Jakarta) on October 1, 1883, where she went to School and Teachers' College. She was good at horseback riding and tennis. Sent to Europe to recover from malaria, she spent a year in Brussels at a finishing school. After Annie returned to Indonesia in 1912, she met Henri Jacques Vermey (Hein), presumably playing tennis. His father, Jan Albertus Wouter Vermey, was a physician who, in 1888, had married Henriette Cccelia de Waal and they had six children, one of whom died in infancy. I had the pleasure of meeting

Jan and Henriette and visiting in their home when I first went to Holland in 1938, as related in the chapter on The Oxford Years. Jan and Henriette's oldest child and only daughter was Albertine ('Tine or 'Tien). She married, but the marriage was not successful, perhaps in part because of the Bohemian life that they led. Tien was a talented interior decorator, who worked closely before the War with the Dutch architect Fritz Eschauzier and after the War, in partnership with Jacqueline Vermey, Henri's second wife, as interior decorators. Tien was the special friend of a famous Dutch mathematician and logician. She was a great listener and inexhaustibly kind. Tien was my advocate during the long years when Nell and I were separated, and Nell would visit Tien to talk about that American fiancé who was thousands of miles away and doing "who knows what" during the war years.

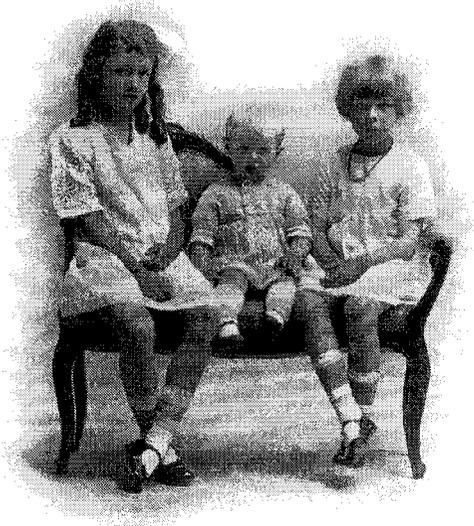
Rudolph (Bob) Vermey, who was #4 in the family, attended agricultural school, learned about sugar production, and went to Cuba to put his knowledge to practical use. There he met and married Grace Korth, a secretary from New York/New Jersey, who was a friend of my mother and was the eventual link for my meeting of Nell. Bob and Grace had four daughters, the first born in Cuba and the others born in Holland, to which the family returned. Bob's work did not go very well during the depression years, and the decision, a fortunate one, was made for the whole family to emigrate to the United States in advance of the war. His brother, Hein, with Annie, made the move possible.

Hein, #2 in the Vermey family, was born March 10, 1892, on the small island of Ambon, which was part of the Dutch East Indies (Indonesia). He had proceeded directly from high school to working as a bank clerk in Kassel, Germany, in order to gain foreign experience. While he was there, he started a tennis club, for which action, incidentally, he was honored 75 years later in a special anniversary celebration. After his stint in Germany, Hein was sent by the trading company/bank for which he worked to Jakarta, where it was that he met Annie, as related above. After an engagement of three years, during half of which they were separated, they married in 1916. Annie and Hein lived in Hong Kong where Hein was an agent for his trading and banking company. Elizabeth Henriette Vermey (Els) was born August 17, 1917. At the end of the First World War, during which the neutrality of the Netherlands had been respected, the family returned to Holland, and Louise Cornelia Vermey (Nell) was born on July 16, 1919, in Bussum, N.H. Ten months later, the family returned to the Far East, where Hein was appointed director of his import/export bank's office in Shanghai. During the five

happy years in Shanghai, Nell's younger sister, Hilda Carola, was born on December 29, 1923. Frequent outbreaks of violent anti-foreigner sentiment caused the family to move back to Indonesia for a time. Hein became a sometime director of the Dinger Family's sugar plantations, operating part of the year from Jakarta and part of each year from the Netherlands. Many, many years later, on separate travels to Jakarta and Shanghai, I could seek out the large houses that the Dinger and Vermeij families had occupied in those cities. Both houses had been converted to multiple family dwellings and were overflowing with children in the years that I saw them.

Nell told me that I should be aware of the smells in the (then) French sector of Shanghai, including a mixture of cooking and laundering. She remembered the freshly laundered and starched smell of her own ama, or nurse. She also remembered the different colors of the people around her, which she regarded as a gift (for humanity). She learned to speak English and attended an English nursery school/kindergarten, of which her main (fond) remembrance was of a little boy named James. Somewhere in her background, there developed Nell's association of letters, names, and words with colors. I used to test her to find out if the individual relationships between sounds and colors changed or were forgotten, but they never varied. I believe she was disappointed that I had no such faculty. Also well recalled were the episodes of seasickness that she experienced on the sea journeys between Europe and the Far East during her earliest years. An aversion to moths must have developed early because she always used the baby word "flipperdeflops" to describe the creatures, and she squealed with displeasure whenever they came near (all her life).

The family moved to Westerveld in 's Graveland, North Holland, in 1927, and Nell attended school in nearby Hilversum. The town, literally "the count's land," consisted essentially of one main road. There were small houses, shops, and laundries backing onto a canal along one side of the road and large estates and a park arrayed along the other side. Westerveld, the name of their house, was one of the estates, consisting of a large Georgian house, separate garage, separate office/house, gardener's house, flower garden, fruit and vegetable garden, tennis court and tennis house, a large pond, and formal paths with occasional benches. Very special was the collection of trees, including unusual "weeping" varieties and a large stand of bamboo. It was an ideal world that Els, Nell, and Hilda could call their own and could share with family friends.



Three sisters, Els, Hilda, and Nell Vermeij

Nell went to school in Hilversum so as not to pick up the local village dialect. At the depth of the depression, Westerveld was closed in order to economize, and Hein and Annie moved to an apartment in Brussels, Belgium. Nell continued her schooling in Hilversum, finishing at the so-called H.B.S., a very thorough girls' school, where she became interested in history and literature but not in mathematics. She performed in school plays and forged strong friendships. One contribution that she made in her geography class was to suggest that the shapes of Africa and South America

looked as though the continents had been joined at some early geological time. The science teacher pooh-poohed the idea, which was ahead of its time. It was several decades later that the paleogeologists concluded that at the beginning of the formation of landmass on planet Earth, there had been one continent, Pangea, in which Africa and South America had been contiguous. During the Hilversum years, Nell lived with the "Tantes" Woutman. Madeline and Ana Woutman were not related but were known to the family by way of Hein's boss in Hong Kong years earlier. Nell was fond of the "Tantes" but was generally reserved with adults and sought friendship with those of her own age by preference. She responded vigorously and effectively when she detected unfairness or bullying and she was very protective of younger children. Somewhere along the way, Nell learned to play the piano, sew, and cook. She received coaching in tennis and golf, and she learned to ski in Bavaria when she was 14 years old.

So it was that in 1938, I met an 18-year-old of intelligence, travel experience, strong character, and athletic ability, as well as beauty, as related in the chapter on "The Oxford Years." During 1937-38, Nell was finishing her schooling in Hilversum, and during 1938-39, she was enrolled in a physical therapy program in the Mensendieck Institute in Amsterdam. There she lived in an apartment with three other trainees, Ientje, Mientje,

and Maas, and experienced an independent professional and a cooperative domestic life. The study following the Mensendieck system required two years; accordingly, it was necessary for Nell to spend 1939-1940 in Amsterdam to complete the study. This was the strong wish of her mother, who felt that it was important for a modern woman to have a profession. Thus, at the beginning of September, 1939, the decision was made that we could be engaged but that Nell would not accompany me to Oxford as the new World War began. We were both very young. Since my laboratory in Oxford shut down practically immediately, there would not have been an educational life in England-at-war, and—for two foreigners—not very useful lives. Nell was able to complete her physical therapy training despite the fact that the Nazis violated Holland's neutrality on May 10, 1940, with the bombing of Rotterdam. From that date, Holland was in the war. As each year went by, difficulties and dangers mounted, culminating in 1944-1945, the famine winter.

It is difficult to put oneself in Nell's place during the years 1940-1945. The best I can do is to retell what I remember hearing from Nell and from members of the family. After her sojourn in Amsterdam, Nell returned to 's Graveland. She found some clients for her physical therapy practice, and she journeyed to Geldermalsen to help take care of Els's daughter, Henriette, who was born to Els and Jaap Versteegh in June, 1941. At some stage, it became necessary to look after the small children of 's Graveland and to try to provide them with food as the supply of rationed food dwindled. Accordingly, Nell assisted in running the local kindergarten which took in as many young children as possible.

The enlarged fruit and vegetable garden of the Vermeys was an important source of food above the rationed level and for barter with other residents of the town. When the food supply dwindled, it was necessary to journey further afield by bicycle. When the rubber bicycle tires wore out, they were replaced by a series of wood strips attached to the rims. When a curfew prevented travel during the day, one had to move on bicycle paths by night. Hand-generator flash lights were used when electric batteries became unavailable. It was Nell who served as a courier for the underground and Nell who rode the bicycle by night all the



Louise Cornelia Vermeij, Holland, 1940  
"Wait for me."

way to the province of Groningen, approximately 80 miles, to exchange family jewelry for butter from a known farm family. Omnipresent was the chance of being shot by a German patrol or strafed by an Allied fighter pilot looking for targets upon returning from a mission. Confiscation of the material that Nell was transporting was an attendant danger. Even after Nell arrived back in 's Graveland, the booty of butter and farm products was not safe from thievery or manipulative distribution. Extra food was needed because the Vermeys had accepted and sheltered two women who had been displaced from the German border area of the Netherlands. Moreover, they were also hiding young men, who were in the underground, in a fake mezzanine area above the ground floor. These fellows naturally did not have ration cards, only falsified identification papers. In the event of a German search of the premises, they either had to maintain perfect silence in their hideaway or else, following delaying tactics, had to ascend to the roof for a temporary (cold) hideout until the inspection was over. Fortunately, no inspection ever extended to the garden sheds where there was an illegal short-wave radio for listening to Allied broadcasts and an illegal pig that was being fattened (somewhat) on garbage from too many unofficial residents.

To this ménage was added an infant, Daniel (Daantje) Hookstra, whose parents were being sent to concentration camps. Nell and her mother heard through a friend that the parents were desperate to save the boy and responded immediately by adopting Daniel. This was a dangerous undertaking because anyone who hid a Jew from the authorities was considered Jewish and risked meeting the same fate. Daniel was a blond, rosy-cheeked child. The cover story was that both his parents had been killed in a bombing. No one ever challenged the adoption, so Daantje was brought up in 's Graveland by Nell as his mother during about three and a half years. The child brought pleasure and hope to the household despite the deprivations. He also survived physical danger when he was nearly asphyxiated because of a malfunctioning kerosene heater and the medical emergencies of the usual childhood illnesses. The story of the parents, their incarceration, and their separate fortunate escapes from death, along with their return to reclaim their son from his war mother, has now appeared in a book written by Eline Hookstra-Dresden, his biological mother. Moreover, Eline has caused Nell's name and the names of her parents to be placed on the List of the Righteous, Yad Vashem, an Israeli production of well-documented cases in which non-Jews have saved the lives of Jews during the War and Holocaust. Marcia and her daughter, Julianna, traveled to Utrecht to accept the honor from the Israeli Consul. Els and Hilda were also present, and Daniel Hookstra himself gave a very moving talk.

He had come from Oregon, his present home, with his wife. Marcia and Daniel had made contact several times before the occasion (1999).

During the war, Hilda became engaged to one of the young men in the underground. He was picked up by the Gestapo and jailed. Who in the family was willing to find out where he was and what was going to happen, or had already happened, to him? It was Nell, on Hilda's behalf, who learned his location and his fate, which was the usual sad one for such captives. At the end of the war, when I appeared on the scene, as described in another chapter, Nell was helping out friends who were trying to reassemble their families or were having children under the difficult end-of-the-war conditions. She could also be of help to Els, who was living in the area below the big rivers that had been liberated earlier than the Hilversum region.

Since our lives converged in 1947, chapters from that year describe the events in which we both participated, our life together. However, there are some events that belong to Nell alone or that are especially indicative of her character and of her development during her years in the United States. I shall try to include exemplary situations, but I know beforehand that the listing and description will not be complete. Possibly the children will be able to augment the picture of this remarkable woman.

Her initial focus was on having children of her own to care for: Kenneth, Marcia, James, and David. There was nothing that made her happier than sharing love with these four, although she convinced them that I came first in her consideration. In a parallel arrangement of priorities, she was convinced that chemistry came first in my consideration. In actuality, there was great interdependence, and true happiness came from a combination of a successful profession, the loving partners, and the loving children. There are many examples of Nell's reaching out in concern and kindness to others. The first was to neighbors who had a small child with an incurable disease. Nell made herself available to the mother for shopping, babysitting, and general helping. The second was a Dutch immigrant family in which the father was trying to become a barber in Illinois. The Illinois license for barbering requires considerable medical information, probably as an historic carry-over of that profession. Nell translated the crucial material from English to Dutch and coached and quizzed the Dutch barber until he found it possible to pass the exams that allowed him to become an Illinois barber and to support his young family. The third was an immigrant from Yugoslavia who was widowed before her husband, a research assistant at the University of Illinois, had seen enough service to receive an adequate pension. She was a skilled seamstress, which made it possible for Nell to help her to obtain, first, private jobs and then a steady position with benefits.

Nell was one of the most naturally hospitable people I have known. Visiting lecturers were welcome to stay with us and were made to feel at home, even when we had very little space to offer. Leslie Sutton and Neville Sidgwick, my Oxford professor, were early visitors, as was Keith Murray, who had become Rector of Lincoln College, Oxford. When hotel accommodations in Urbana-Champaign improved, we at least had the visitors to dinner. When Rolf and Trudl Huisgen came to our house, there was an especially touching moment when the two wives met. Trudl was the first German woman Nell was meeting after the war, and Nell was the first Dutch woman Trudl was meeting. Both had been nervous in anticipation, but they embraced warmly when Trudl started apologizing for the German invasion and occupation of Holland, and they became long-term friends. Klaus Jann, my postdoctorate, and Barbara Jann, a postdoctorate in Biochemistry, also from Germany, were immediately welcome. My Japanese postdoctorates Michinori Oki, Takco Sato, and Tozo Fujii, and their wives, became practically family. Barbara Rodbell, the Dutch wife of a postdoctorate in Biochemistry, was made to feel at home, as were Binne and Henny Zwanenburg, also from the Netherlands. When Bozenna Golankiewicz came from Poland to work with me as a postdoctorate, as her husband had done some years earlier, Nell told her that she would help her find a place to live for the contract year. However, they never did search for a place so stay. After having a cup of coffee together at home, Nell said, "This is silly and not very hospitable. You will stay with us, naturally; you can have your own room and bath, eat as many meals with us as you like, and still be independent." The same thing happened when Dr. Jorge Barrio returned from Argentina for a second stint in my laboratory. It was important that he live inexpensively in the U.S. for six months so that he could save money to bring his family (five in all) from Argentina to join him. Nell made it possible. I believe she would have been willing to board all of my single foreign postdoctorates if she had had time for it.

There would be innumerable ways to indicate Nell's friendliness to others—to neighbors, to all residents of Urbana and Champaign whom she met socially, on committees, in church groups, and even casually. I shall illustrate with just one instance what occurred in Snowmass Village, Colorado. When a couple moved into the house next to us in Melton Ranch I, Nell said, "I believe I'll go over to see if I can do anything for them." Ann Watson, the new resident, described it this way: "When I went to my back door upon hearing knocking, I greeted this beautiful blonde who asked to be put to work if there were anything she could do for us. She really meant it, so I had to let her do some unpacking and cleaning." Now, Ann and

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Jim Watson are not people who normally need help. They can pay for it very well. This was the beginning of an abiding friendship, continued through the present.

As I have said elsewhere, Nell took very seriously the process of becoming a U.S. citizen, and she turned to the League of Woman Voters for guidance and, subsequently, affiliation when she became a citizen. She became involved with the League's housing study because it seemed to her that there was inequality in the opportunity for black people in Urbana-Champaign to acquire the housing they desired and could afford. She was also involved in the League's project to set minimum standards for rental housing. Recognized for her energy and leadership, Nell served twice as president of the Campaign County League of Women Voters. Nell's church work in the First Congregational Church of Champaign, Illinois, began as a Sunday School teacher and then as an active member of the congregation, leading up to being the moderator of the congregation for two years. Crucial amalgamation of three churches and ministerial changes occurred during that period. Nell had the diplomacy, strength, and poise to be moderator among members who occasionally became very emotional. A plaque on the wall of the church commemorates her service.

Nell joined Church Women United because she liked the idea of Christian women of different color and religious persuasion working together. She made the local membership aware of unfair practices in real estate transactions, with the result that CWU was the first organization to publicly endorse open housing. As soon as this principle was made law in Illinois, Nell was appointed a member of the Fair Housing Board in Urbana, on which she served three years. She also became involved in the urban renewal plan for Champaign, and she and other members of the League of Women Voters (in this case) convinced the planning committee to drop the original proposal for mass evacuation in favor of a proposal according to which no house would be demolished until acceptable living quarters could be found for the



Nell, League of Women Voters, 1963

occupants. Other issues that claimed her time and effort were child welfare, beautification of the environment, juvenile justice, criminal justice, and alternatives to incarceration. Church Women United undertook to raise money to build a chapel at the women's prison in Dwight, Illinois. Nell became a member of the state committee for the Dwight prison project, and in that capacity gave fund-raising slide presentations throughout central Illinois. Shortly after Nell's death in 1987, the chapel was built and we were able to contribute to the purchase of a small organ. Nell served many years on the state board of CWU and eleven years on the national board, two of these as national vice president. Remarkable for her ability to examine issues objectively, Nell gained a deeper understanding of human nature because of her ability to understand problems within the interracial and interdenominational membership of CWU.



Nell, Dunewood, 1985

On January 17, 1987, the Champaign, Illinois, Chapter of the National Council of Negro Women saluted Louise C. Leonard as "Civic Worker, Facilitator of Interracial Harmony, Dedicated Christian" at their second awards banquet. Son David attended the ceremony on behalf of the family and accepted the award plaque in Nell's honor. Another bronze plaque adorns the wall of the cottage in Dunewood, announcing that the Bronze Circle of the College of Liberal Arts and Sciences bestows on Louise V.

Leonard Life Membership "in grateful recognition for distinguished loyalty and support of the pursuit of excellence in education, scholarship, and service, 1986." It was her initiation of the fund that set up the Nelson J. Leonard Distinguished Lectureship at the University of Illinois upon retirement in the Spring of 1986. Nell's last participation in a CWU event was in the Central Area Institute on October 21, 1986, when she was greeted as a "tower of strength."

## RETIREMENT 1986 AND RESEARCH THEREAFTER

During my last official year on the faculty at Illinois, another surprise gift was being contemplated. The discussion started innocently enough with my good friend Harry Drickamer asking me to what I would like my name attached when I retired. We talked about visiting lecturers, about how they usually flit through campus for one lecture and about how many of our name lectureships at the University are for particular subject coverage. Our discussion continued through a week or two until we settled on an ideal combination of provisions. The lecturer could represent any discipline related to chemistry, would give at least two lectures on separate days and would thus be available to speak personally with staff and students, and the selection would be made by the Executive Committee of the School of Chemical Sciences from among nominations received, mainly from Chemistry, Biochemistry and Chemical Engineering or their successor organizations. Because no arrangement is necessarily perfect forever, we added the provision that the Executive Committee could alter the conditions when desirable.

What I did not know at the outset was that Nell and Harry were already looking into the financial requirements for such a lectureship which they would call the Nelson J. Leonard Distinguished Lectureship. They figured that \$100,000 would be necessary to endow the lectureship and that they could solicit gifts from colleagues and former students once they had half of that sum in hand. That amount was produced by Nell, by the two companies with whom I had consulted for many years: Eli Lilly and Company and the Monsanto Company, and by *Organic Syntheses, Inc.* That was a great surprise and pleasure for me, but both of these reactions were greatly magnified when the contributions flowed in from my colleagues, friends, and former students, who were solicited by my trusty secretary, Patti Silver, from listings suggested by Nell, Harry, and Carl Johnson. With the requisite amount in hand (exceeded and still in hand), we could provide a handsome honorarium and first class transportation for the lecturer.

The first Leonard Lecturer was James P. Collman in the spring of 1987. He had been a graduate student who worked with Professor R. C. Fuson during two years of my early teaching on the Illinois staff. He was skilled in organic, inorganic, and bioinorganic chemistry, Professor at Stanford University, and, in all, an admirable first selectee to represent the general interest that the Lectureship conditions were supposed to generate. Succeeding years brought many outstanding scientists to the campus each April. Included were U.S., Swiss, and French chemists and, to this date, eight Nobel Laureates. I have returned regularly to campus for the lectures, except during the two years when I sustained ski injuries in March. I continue to appreciate the Illinois connection, as I did at the inception of the Lectureship.

Retirement might have been idyllic, but it was accompanied by disaster. Nell received a surprise diagnosis of cancer of the liver in early September, 1986. The primary source of the cancer was not detected, and the metastatic tumors of the liver were only mildly mitigated by a sequence of chemotherapy sessions. I have touched on the subject of her difficult months of illness in my chapter about her life. The strong support by visits of the children and their spouses as often as they could manage and by the visits of her sisters, Els and Hilda from Holland, lightened the duties of the retired professor, who was transformed into chief cook, nurse, shopper, and informant. A terminal illness can be devastating, but the experience can also be transformed into one that illuminates the heart and soul of a marriage. So it was for us.

## Continuing Research

In gradually compressed laboratory space at the University of Illinois, my research group was systematically reduced in size. This was a process that I had started prior to retirement. Nevertheless, my postdoctorates continued to work diligently whether or not I was in residence with the result that we published 38 more papers after my retirement. I am grateful for the originality and steady focus of their work as well as for their loyalty during this period. We continued to find small compounds that would react with the nucleic acid components to create an extra ring, so-called annelating agents, e.g., N-chlorocarbonyl isocyanate, and we continued to review applications of the etheno-bridged nucleotides in enzyme reactions, protein binding, structural diagnosis, and carcinogenesis.

I had long wondered whether 3-isodeoxyadenosine (iA) could be incorporated in an oligodeoxynucleotide representative of DNA and how

this isomer of adenosine would hydrogen-bond. Balkrishen and Neelima Bhat, my prize husband and wife pair of coworkers, obliged me by finding that a DNA fragment incorporating iA could be synthesized by using novel protecting groups that can be removed under mild conditions. Then, with my professor colleague, Andy Wang, and his coworker Howard Robinson, we learned that the oligonucleotide d(CG[iA]TCG) forms a well-defined B-type duplex with Hoogsteen-type iA•T base pairs flanked by Watson-Crick pairs. The structure determination of the hexamer double helix was done by obtaining so-called 2D-NOESY Nuclear Magnetic Spectra. The results supported the Hoogsteen-type base pairing predicted in our collaborative research with Leslie Orgel's laboratory at the Salk Institute for oligo(iA)-oligo(U) complexes. A possible scenario that we deduced (1996) from the results was that N3 instead of N9 attachment of the deoxyribosyl to adenine in nature would have resulted in satisfactory DNA structure and base pairing; however, the ease of hydrolysis of the N3-C1' bond versus N9-C1' would have strongly favored sustenance and endurance of the adenosine and deoxyadenosine components over the 3-substituted ones.

While the 3-isodeoxyadenosine incorporation quest was proceeding, another major investigation was initiated and then developed. The classical Watson-Crick double-helical model of DNA/RNA possesses well-defined hydrogen bonds that hold the two strands in complementarity. Together with Belakudru Devadas, we constructed a covalently-linked cross section with molecular architecture similar to the hydrogen-bonded base pair. We regarded this as a potential candidate for incorporation into DNA/RNA biological systems, and we synthesized three representatives in which two central five-membered aromatic rings substituted for the eight-membered central ring, doubly hydrogen-bonded, in the natural cross section. In addition to the model purine-pyrimidine combination, we also prepared covalently-linked purine-purine types that resembled a "long base pair" bulge in a double-helical RNA or DNA cross section and pyrimidine-pyrimidine types that correspond to a hypothetical "short base pair" analogous to a pinched-in RNA or DNA cross section. The finding that these compounds were fluorescent rendered them as suitable probes to be examined by their fluorescent yields, lifetimes, and polarizations.

The DNA that is normally isolated from natural double-helical sources consists of antiparallel single strands. Our versatile synthetic methodology also allowed us to construct covalently-linked cross sections that are representative of base-pairing in a double-helical polynucleotide with *parallel* strands (psDNA)). Its geometry and fluorescence properties make it an attractive unit for possible intercalation and polynucleotide sequence

incorporation. In a condensation and commentary on our cross-section research that appeared in *Chemtracts—Organic Chemistry* 5, 133-136 (1992), Robert J. Duff and Sidney M. Hecht concluded:

“The DNA and RNA cross sections reported by Leonard and his co-workers have the wherewithal to further our understanding of DNA and RNA structure and to control the local environment in a defined fashion. By the use of these cross sections one could, for example, characterize the nature of DNA binding by enzymes that recognize mismatched bases or study the nature of requirements for DNA unwinding during replication and transcription.”

In fact, we found that in our dimensional analogue of dA•dT, with a covalently-linked cross section containing a  $10\pi$  electron core nucleus, the central pentacyclic ring system is coplanar ( $\pm 0.03\text{\AA}$ ) by x-ray structure determination, whereas natural dA•dT has a slight propeller twist. The sizes of the central sections of dA•dT and of the covalently-linked model were within  $0.3\text{\AA}$  in width. It was possible to add the cross sectional model, which we chose to abbreviate as AX $\bar{T}$ , to the oligoribonucleotide d(A)<sub>6</sub> with bacteriophage T4 RNA ligase. Finally, Balkrishen Bhat was able to attach deoxyadenylic and deoxythymidilic acids to AX $\bar{T}$  on the same side (proximal) and on the opposite side (distal) by synthetic procedures involving various combined protection/deprotection steps. When the structures in aqueous solution, buffered at pH 7.0, were examined by 2D-NOSEY NMR spectroscopy by Andy Wang and Howard Robinson, it was found that the covalently-linked cross section provides a template that stabilizes dA dT base pairing in the proximal isomer at 2°C, whereas in the distal isomer, it contributes to favorable conformations for intermolecular association. The proximally-substituted isomer is related to a DNA terminating in  $\overline{TT}$  in which the duplex is unraveling only at the terminal A•T pair.

It was a relief to have answered our last two research questions. The Bhats said they would stay with me until we had arrived at satisfactory answers. I was holding them back from obtaining satisfactory salaries, so I could not ask for more. Research is never really concluded. In the case of 3-isodeoxyadenosine, we would have liked to incorporate it in place of deoxyadenosine in a dodecamer for which we could determine *both* structure and biological activity. In the case of the covalently linked dAXdT, we would have liked to incorporate it in pseudo-DNA structures in order to learn (1) what stability it would confer on the double helix and (2) whether repair enzymes could remove it and replace with dA and dT in appropriate systems. If the dAXdT could be introduced into a fast-

growing DNA system, it could interrupt growth because it would interfere with the replication step if the two strands were not separable. Such a compound might serve as an anti-cancer drug.

Even if such ideas could not be pursued further because of running out of time, support, and personnel, I was happy with the results that we could conclude. We turned to the computer to construct an oligodeoxynucleotide containing our planar cross section for a comparison with a native oligodeoxynucleotide. There was very little difference in the two structures that were “built” using Macromodel (version 2.5) and optimized using the amber united atom force-field. From the improved definition that was apparent in the blow-ups, it was obvious that the furanose rings were flexible enough that the cross section dA $\times$ dT can be accommodated without significant change in the duplex. Confirmation of the validity of such computation and graphic comparison lies in future experiments. In the meantime, it was rewarding to read, in a communication by Qiao and Kishi, Harvard University, in *Angewandte Chemie* (International Edition) **38**, 928-931 (1999):

“The concept of covalently linked cross sections with molecular architecture similar to Watson-Crick hydrogen-bonded base pairs was introduced by Leonard in the mid-1980s.”

Professor Kishi then provided references to several types of covalently linked systems that were developed in the 1990s and went on to describe the initiation of his research on Watson-Crick base pairs linked with a methylene bridge. From that date, his papers continue to provide in detail valuable research information concerning the behavior of his singly covalently-linked DNA/RNA-type cross sections. It is such continuity in research that guarantees that one’s contributions to science do not die. They are used for the construction of the next advance and eventual practical application.

Another example of such continuity in research is found in the work of Eric T. Kool of Stanford University on widening the double helix [*Science* **302**, 868 (2003)], as reported in the Nov. 3 issue of *Chem. And Eng. News*, 12 (2003):

“The research was inspired in part by studies in the 1970s led by Nelson J. Leonard at the University of Illinois, Urbana-Champaign, in which a benzene ring was added to adenine (A), resulting in xA, an expanded base.”

Applications are continuing.

## NATIONAL INSTITUTES OF HEALTH—1989, 1990

**I**n early December of 1987, I was invited to visit Arnold and Hanni Brossi in Bethesda, Maryland. It was my first trip outside Urbana since I had recovered from the cancer surgery in Boston in September, followed by recuperation at the Blouts in Cambridge and with Marcia and Tom Carlson in Maplewood, New Jersey, during October and into November. Aside from the social visit, Arnold, together with Bernhard Witkop, wanted to acquaint me further with the National Institutes of Health, and I was given the grand tour. There was a complementary purpose to the visit because I was introduced to the administrators in charge of the visiting scholars program. A renewed invitational letter that arrived in 1988 stated that I had been appointed a Fogarty Scholar-in-Residence of the N.I.H. for twelve months (stipend, \$50,000), with the timing arranged for mutual convenience: February-June, 1989; October-December, 1989; and February-May, 1990. I was assigned an apartment on the N.I.H. campus during the first two periods, and I rented a house during the third period.

The three stays were long enough for me to become thoroughly acquainted with Bethesda and D.C. Office accommodation was provided in the Stone House on the N.I.H. campus, where the hospitality of Dr. Jack R. Schmidt and Ms. Rita Singer and their staff guaranteed the most efficient and profitable use of my time. The Brossis and the Witkops made me feel at home and included me in all events social and professional. In turn, I entertained many visitors—family and friends—who were happy to find that they had a host so close to Washington. I was able to reconnect with old friends who lived in the Washington area, which added to the pleasure of my residence there.

One of the most obvious benefits of residence at the National Institutes of Health was the opportunity of attendance at the numerous seminars and symposia that were scheduled. In my own experience, overzealous attendance in the initial weeks gave way to more discriminating selection among the many excellent possibilities. With this modification came a more measured pace of absorption of the information provided. I was still

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guided by the purpose, stated in my scholarship acceptance letter, to reach out to learn and help solve problems encountered in medicine at the molecular level. The weekly meetings of the Fogarty Scholars were especially useful in this regard because of the diversity of biophysical, biochemical, and medical subjects covered. The seminar at one of the regular Friday meetings that I presented in June, 1989, was on the subject "Attempts at Selective Inhibition of DNA Synthesis and Proliferation."

Interaction with the N.I.H. scientists was another great benefit of a reasonable term of residence as a Scholar. For me, this meant talking with old friends and being brought up to date on their current research and their future goals. I accumulated and studied their selected publications via reprints generously provided. During an extended absence of Dr. Brossi, I served as a research consultant for his junior colleagues, visiting their laboratories two or three times per week, and I was more than generously thanked in the resulting publications (8).

The most valuable experience offered by the Fogarty Scholarship was the provision of quiet, uninterrupted time periods for thinking, reading, and writing. I have never before enjoyed such a luxurious gift of time and facilities, not even during the usual academic sabbatical leaves. Some of the writing involved the completion of previous commitments; nevertheless, my efficiency of composition rose to a new level in Bethesda. The communication systems provided by the N.I.H. allowed frequent contact with my postdoctoral research group at the University of Illinois in Urbana and active collaboration with colleagues at the University of Illinois, Chicago Circle; M.I.T.; the Salk



Arnold Brossi

Institute; and the Medical Biology Institute in La Jolla, California. Access to the National Library of Medicine was especially useful. Seven published articles were written during my time spent at the N.I.H., and two review articles resulted from a separate 12-day immersion in the National Medical Library which was provided to bring the total days of scholarship up to 365.

During the N.I.H. appointment of twelve months and during the other months of the years 1989-1990, I fulfilled my obligations in various

organizations, national and international, attended meetings, gave lectures here and there, and was an occasional after-dinner speaker at retirements or advanced birthdays. Being an after-dinner speaker seems to go along with ripening old age! One such occasion, in the early spring of 1989, was a Symposium on "Frontiers in Organic Chemistry" at the California Institute of Technology, Pasadena, in honor of Jack Roberts. At the reception before the dinner, I was introduced to Peggy Phelps. Edith Roberts had described the wonders of this lady before the day of our meeting. Edith had also persuaded Peggy to return to Pasadena a day early from an Aspen skiing vacation in order to meet this old Chemistry Professor from Urbana, Illinois. Each of us eyed the other rather skeptically. The advance build-up by Edith had robbed us of the first simple questions to ask each other upon meeting. I suggested that we go into the dining room together, where we discovered that we had adjacent place cards at the table. Edith was not leaving anything to chance. Peggy made a game try at understanding what chemists were like. She was surrounded by them. I tried to live up to my advanced billing, whatever that might have been. Peggy and I became new friends, but not quite connected.



John D. Roberts



Edith Roberts

I learned that Peggy would be in Aspen at Christmas, so I asked her well in advance whether I might take her to dinner on December 28, 1989. It blew her mind that someone would ask for a "date" months ahead. It also surprised her that, when we stopped at my house in Snowmass Village on the way to dinner, I asked Marcia and Tom to come along. What was this—a "family date"? When I was invited to neighbors Jim and

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Ann Watson for a New Year's Eve party, I asked rather boldly whether they would consider asking Peggy to come. She was an old friend of theirs and could obtain a ride from Aspen with the Chandlers, who had been invited. I confessed to Ann that I was really interested in Peggy.

The party brought us together a little closer, so that 1990 was ushered in on an optimistic note. Only slightly disturbing was that sometime friends present at the party referred to me as "Mason," the name of Peggy's former husband. I sent Ann Watson flowers to acknowledge her help.



Peggy Phelps

## UNIVERSITY OF CALIFORNIA, SAN DIEGO—1990

In 1981, I had the good fortune to be a guest lecturer for a week at the University of California, San Diego. The invitation to be Calbiochem-Behring Corp., UC San Diego Foundation Lecturer, which was probably instigated by my good friend and skiing companion David Kearns, included hospitality for Nell and me at a charming little inn in La Jolla, La Valencia. It had the reputation of being a getaway destination for movie stars when they sought a clandestine weekend. The week was a superb combination of chemistry, biochemistry, sight-seeing and social occasions in attractive surroundings. The week ended with a banquet at which I had the pleasure of sitting next to Joseph Mayer and the widow of Harold Urey. Professors Mayer and Urey had taught me physical chemistry at Columbia University more than 40 years earlier, so I could reminisce a bit when it came my turn to thank everyone for our glorious week.

By 1990, I seemed to have developed an attraction for testing myself by “working” at locations other than Urbana, Illinois, and a return to San Diego was high on my wish list. Murray Goodman of UC San Diego kindly arranged for me to be a Visiting Professor during June/July and reserved a one-bedroom, fully furnished apartment in the La Jolla Sol Apartments (aka UCSD Visitors Inn). The advantages of the Inn included maid service on weekdays, a reserved parking space, pool, and tennis courts. David and Alice Kearns were also hosts, although David was working through the debilitating results of a serious ski accident, which meant that I did not see as much of him as we had intended. He provided me, however, with the welcomed services of his assistant, Shelley Hexom. Again, hospitality and friendship were extended on every side. There was a feeling of optimism that surrounded one in La Jolla, probably due to both the people and the weather. It was certainly present also at Scripps Research Institute and the Salk Institute, which I visited.

The week in 1981 had brought me in contact with Leslie Orgel of the Salk Institute for Biological Studies, also a professor at UCSD, and made me aware especially of his fundamental research on the oligomerization

of activated mononucleotides on polynucleotide templates. As a result of the earlier contact, in 1988 we published together on the poly(U) template-directed oligomerization of 3-isoadenosine 5'-phosphate as the activated imidazolide, which constituted a new contribution to prebiotic research. When I returned to UCSD as a Visiting Professor in 1990, we completed a sequel to the first oligomerization paper that was then published in the following year. The amusing feature of the sequel was the way in which it was written—at a series of four lunches in a delightful restaurant in La Jolla overlooking the Pacific. Each week I would produce a draft, and each week Leslie Orgel would provide me with revisions he considered necessary to incorporate in the next draft. I had the distinct impression of being a graduate student again under the tutelage of Dr. Leslie Sutton of the University of Oxford, who had indeed been a mentor for both Leslie (Orgel) and me in earlier years.

Residence in La Jolla meant that I could entertain visitors, including Kenneth, Barbara, and Jamie and special friends living in the area. Edith Roberts telephoned to tell me that Peggy Phelps had a beach house in Oceanside, about one-half hour away from La Jolla. I must have responded with something like “That’s nice,” but I did not think of telephoning her to ask if I might come up for a swim. Edith directed me to do just that. She had already told Peggy I was staying in La Jolla, and Peggy must also have said something like, “That’s nice. Why doesn’t he call me if he wants to come to St. Malo, Oceanside for a swim?”

The director was having trouble getting her actors together. Finally I called, was invited for a swim and lunch, and met Mason Phelps, Jr. The pavane continued with a duo dinner in Del Mar, between Oceanside and La Jolla. Peggy did not find that either chivalrous or romantic. It was just practical. Nevertheless, we did advance the relationship with a promise to go skiing together when next we met in Aspen.



Skiing with Peggy, Aspen

## CALTECH AS HOME BASE— 1991 Present

**I**n July, 1991, I responded positively to an invitation from Fred Anson, Chairman of the Division of Chemistry and Chemical Engineering of The California Institute of Technology in Pasadena, California, to be a Sherman Fairchild Distinguished Scholar during the fall quarter of 1991. To be provided under the terms of the scholarship were an office, computer and related costs, travel expenses, an apartment, and a rented car. I did not incur much expense for Caltech because Peggy Phelps offered me housing in her little guest house and transportation via a little Honda, her second car. Peggy's house at 389 California Terrace, Pasadena, is just 2.2 miles from the Caltech campus. The appointment was ideal. It allowed me to keep in touch with my researchers at Illinois, while at Caltech I attended departmental seminars and the research seminars of Peter Dervan and Jacqueline Barton in particular. I could also follow closely the research work of the other members of the Chemistry faculty. The Athenacum provided an agreeable place for luncheon with the young members in the basement cafeteria and with older and retired members of the faculty representing astronomy, astrophysics, physics, geology, chemistry, and biology in the main dining room.

I gave a chemical research conference talk in November of 1991, and after the students learned the compass of my research, we found an easier basis for discussion. In terms of research collaboration, Jack Roberts and I did proofreading of a joint research paper (our fourth) that was published in 1992. My collaboration with Dr. Fu-Tong Liu, Head of the Arthritis and Autoimmune Disease Section of Scripps Institute, was made much easier and more efficient by my presence at Caltech. I was made to feel at home, and I found time for thinking and writing. The library facilities are superior.

During the winter and spring quarters of the school year 1991-1992, I was still in residence at Caltech pending formalization of a new appointment, Faculty Associate in Chemistry, a "no-loss, no-gain, no-duties" position, i.e., without stipend. I was delighted to accept in March

of 1992 and even more delighted to accept renewals of the appointment after each periodic review. The receipt of an Arthur C. Cope Scholar Award of the American Chemical Society in 1995 fortuitously guaranteed continued financing of office expenses at Caltech, which was especially important for my writing and for liaison with the research that was still going on in my laboratory at Illinois. It also meant that my Illinois secretary, Patricia Silver, could be employed on an hourly basis to complete my review and research papers.

As my chemist friends recognized that I now had a new home at Caltech and that I had not really retired from doing chemistry, I received invitations at a restored rate. Especially of interest in my first year at Caltech was an invited Syntex Lecture at the University of Colorado in February, 1992, after which Stanley and Barbara Cristol drove Peggy and me to Vail, Colorado, for two days of skiing as a partial reward. This was followed shortly by a chemistry seminar at Brown University, which allowed us to spend time with Elkan and Gail Blout in Cambridge, Massachusetts, before and after my bus trip down to Providence for a visit to Brown. I accompanied Jack Roberts to Anaheim, California, when he received an award from the Orange County Section of the American Chemical Society and to the University of Nevada when he gave a name lectureship. From Southern California, it was much more convenient (than from Illinois) to attend the Annual William S. Johnson Symposia in Organic Chemistry held at Stanford University every October. I have continued to be a fixture at these symposia because the excellent roster of speakers guaranteed that the attendees would be hearing a discussion of the very best and the most current chemistry. In April of 1992, I returned to Stanford for a Symposium on Organometallic Chemistry and Materials Science honoring James Collman, who had been a Ph.D. research student with R. C. Fuson and was the first Nelson J. Leonard Distinguished Lecturer at the University of Illinois. Also in April, I returned to Illinois to hear Thomas A. Steitz of Yale, the Leonard Lecturer of 1992, which was the first of my annual spring pilgrimages to that very special place.

The 1992-1993 school year started with the Arnold Lectureship at Southern Illinois University in Carbondale and a visit made special by the hospitality of former Illini including Roger Beyler, who was an early Ph.D. of mine, and Michael Groziak, who did senior research under my direction in recent times. In November, I was also called upon to fulfill an obligation that was carried over from the Fogarty Scholarship that I had held at the National Institutes of Health, namely, to organize an International Conference at the N.I.H. and to solicit the additional funds that would be required "to make it a gracious event, with ample opportunity for informal

discussion.” I am not good at soliciting funds, but I did manage to bring in enough thousands from friends in industry to support a good conference in Bethesda, Maryland. My fellow Organizing Committee members V. Sasisekharan, H. Todd Miles, Robert L. Jernigan, and I invited distinguished and broadly representative speakers to perform at our International Conference on Structures, Conformations and Interactions of Nucleic Acids, which attracted a large audience.

One of the more exotic conferences that I attended with Peggy (by invitation) was the Scripps Institute Symposium on Frontiers of Biomedical Research in Indian Wells, California, in February of 1993, which gave us the opportunity of visiting Palm Springs and Palm Desert as well. Biotech companies abound in California. I visited and lectured at Genta and ISIS in the spring. My former graduate student, Doug Cole, has been developing some very impressive antisense drugs at ISIS Pharmaceuticals. In December of 1993, I was invited to give the Tanabe Research Lecture at the Scripps Research Institute in La Jolla. The work being done there in chemistry was and is spectacular. Accordingly, my day that was taken up with individual discussions was exciting. Peggy joined me at the end of the day when our host, Professor K.C. Nicolau took us to the home of Ms. Marianne McDonald, an art collector and a supporter of the research work at Scripps, for a dinner that was really a banquet.

During the 1993-1994 academic year, Peggy and I were also guests at the University of Oregon in Eugene. Virgil and Carol Boekelheide had made a bequest to the University of Oregon Foundation for an endowment fund to support and enhance teaching and research in the faculties of Chemistry, Music and Dance. The fund was matched by the State Board of Higher Education, and a University of Oregon Creativity Award was established in those areas. The first award in Chemistry was made to me. Virgil and I had been starting Instructors together at the University of Illinois and had followed each other's research from that early time. Carol may have remembered that when she was President of the German Club at Illinois she had inveigled me to sing some lieder for her club. In any case, I enjoyed two days of discussions with faculty and students and gave the Award Lecture. Peggy then joined me for the final two days when we enjoyed some parties and a concert of the Oregon Symphony Orchestra and an evening of “Opera à la Carte” featuring the University of Oregon Opera Workshop.

During the 1994-1995 academic year, I ventured on the last lecture tour that I was willing to participate in: a Parke-Davis Michigan Chemistry Community Tour-1994, organized by Anthony W. Czarnik, who was a former Ph.D. student of mine. The idea of instituting such annual tours

was also Tony's brainchild. The tour involved a lecture a day at Wayne State University, University of Toledo, University of Michigan, Michigan State University, and Parke-Davis Pharmaceutical Research in Ann Arbor and transportation between locations by rented car. There were former students, friends, or research collaborators at each stop, along with animated discussion with faculty, staff, and students and great hospitality. I admit to being tired at the conclusion of the tour, which ended pleasantly with a dinner reception at Tony Czarnik's house. In the spring, a visit to California State University Long Beach required two lectures in one day: a noon presentation for a general science audience and an afternoon technical presentation. Tom Maricich was my host in the Chemistry Department chaired by Ken Marsi. I was happy to respond to the request of the President and Vice President for letters of evaluation because the faculty's commitment to teaching and early introduction of their students into research was exemplary. What I saw at Long Beach deserved to be nurtured and given support and continuity. It is easy to recall the student and faculty interest and enthusiasm that I experienced on that Cal State Long Beach visit, and I was most impressed by the close relationship between students and faculty after graduation., CSULB has very loyal alumni from their Chemistry and Biochemistry Departments.

On the occasion of the 65<sup>th</sup> birthday and retirement of Professor U.K. Pandit from the University of Amsterdam on December 1, 1995, there was a symposium on the "Bio-frontiers of Organic Chemistry," in which Upendra Pandit and Binne Zwancenburg were speakers. Both had been very helpful in organizing IUPAC symposia, and Binne, who had been a postdoctoral research associate of mine, was a Professor at the University of Nijmegen. I decided to attend because I had accumulated so many United Airline miles that I could travel free, and it was well worthwhile. The visit to the Netherlands also allowed me to spend treasured time with my sisters-in-law, Hilda and Els, my stepmother-in-law Jacqueline Vermey-Volk, and her son Dr. Maarten von Balluseck and his wife. The trip proved again how convenient it was to travel around Holland by train.

Larry Overman was my host for a seminar visit to the Chemistry Department at the University of California Irvine, which is only 63 miles from Pasadena and where old friends Harold W. Moore and Robert W. Taft had contributed mightily to the early growth of the department. The campus was still festooned with banners celebrating the recent Nobel Prize of staff member F. Sherwood Rowland, who graciously accepted an invitation to be the 1998 Leonard Lecturer at the University of Illinois. There were more friends to see at Vanderbilt University where I gave

the Ingersoll Memorial Lecture in April, 1996, in particular Stan and Ann Tarbell, Tom Harris, and Fred Guengerich. Both Stan and Fred had Illinois connections. My former graduate student, Carl Johnson of Wayne State University, had given the 1993 Ingersoll Lecture. I was elected to membership in the American Philosophical Society in 1996 and signed the role book in the following year along with Sherry Rowland. The following entry appeared in the program:

**Nelson J. Leonard**

**Reynold C. Fuson Professor Emeritus, University of Illinois, 1986—and Faculty Associate, California Institute of Technology, 1993-**

Ph.D., Columbia University, 1942. Assistant professor, 1947-49, associate professor, 1949-52, professor, 1952-73, Reynold C. Fuson Professor of Chemistry, 1981-86, Professor of Biochemistry, 1973-86, University of Illinois; Fairchild Scholar, Cal Tech, 1991-92. Award for Creative Work in Synthetic Chemistry, American Chemical Society, 1963; Medal for Creative Research in Synthetic Organic Chemistry, Synthetic Organic Chemical Manufacturers Association, 1970; Roger Adams Award in Organic Chemistry, 1981; Edgar Fahs Smith Award, American Chemical Society, 1975; George Willard Wheland Award, University of Chicago, 1991. American Academy of Arts & Sciences (President, Midwestern Section, 1990-); National Academy of Sciences.

After an early career as a concert singer, Nelson Leonard concentrated on science with great success, first as a synthetic-organic chemist, then as a biochemist. In both areas he has shown originality and creativity. His early work on the chemistry of rings containing nitrogen was seminal for many applications. It led him to pioneering work on biologically active compounds, including some of great importance in plant physiology. His recent synthetic work is making possible a deeper understanding of how the DNA double helix structures are held together and how to detect changes with great sensitivity.

Leonard provided scholarly and scientific leadership as former Vice President of the American Academy of Arts and Sciences and as former President of the Organic Division of the International Union of Pure and Applied Chemistry.

My title for a lecture at the University of Nevada, Reno, in November 1997 indicates that I no longer have new and exciting research to describe, but that I still have yarns or anecdotes to disclose: "Surprises Along Carefully Planned Pathways of Research in Organic Chemistry." Obviously, I have a scientific past. The present time at Caltech is occupied with attending seminars, service on the Freshman Admissions Committee, writing letters especially of the nominating and congratulatory kind, and conferring with students, staff, and visitors.

## TRAVELS WITH PEGGY

Peggy has been a world traveler from the age of five, when she journeyed with her family by steamship to Southampton and thence by the steam yacht *Iolanda* to visit her grandmother in Marakesh, Morocco. Holiday trips to Bermuda after the war were followed by a trip to Brazil and one to Europe. After Mason, Evans, and Taylor were born and had grown sufficiently, travel began in earnest—yearly trips to Aspen for Christmas and Easter vacations, ski holidays in Austria and Switzerland; sojourns during the Paris Air Shows in connection with her husband Mason's aircraft business; trekking adventures in the Himalayas and in Peru; safaris in the national parks of Africa; also, a jaunt that touched on Japan, Australia, Bali, and Bora Bora. Peggy also traveled to England and Ireland to watch Mason Jr. compete in international equestrian events.

Peggy initiated an art travel program for the Fellows of Contemporary Art, a support group for the Pasadena Art Museum, and led several European tours. When she was on her own, she lived in London and traveled from there, continuing the program she had initiated for the Fellows. Another group, the Pasadena Art Alliance, took her to India and Morocco. It is not surprising that travel has been a significant component of our life together, especially since I had also been indulging in a peripatetic existence for some years.

### 1991-1992

The initial travel in 1991 consisted of my visits to Pasadena, first to the Roberts' home and then to Peggy's little house on California Terrace, and to Aspen/Snowmass where we converged for skiing and an Aspenyl Conference. Aspen had been a skiing destination for Peggy since 1951 and for the Leonard family from 1960. Incidentally, in one year or another, both families had stayed at Hillside Lodge in Aspen, which was the converted village jail. When Peggy was in Chicago participating in an art tour in the Spring of 1991, I joined her at the end and brought her down to Urbana-Champaign to show her a cross-section of university life and to

introduce her to my good friends. Earlier in Chicago or, more specifically Lake Forest, a dozen of her friends had provided a luncheon to greet Peggy and her new “gentleman friend,” so I was just reciprocating the process in a milder way.

By June of 1991, we felt that we knew each other well enough to travel together to Switzerland with the Fellows of Contemporary Art. Our decision astonished but pleased Edith Roberts. I would be meeting another dozen of Peggy’s art-loving friends, and in Zürich, we would have dinner with my great chemistry friends, Professor Vlado Prelog and Albert Eschenmoser, together with Elizabeth Eschenmoser. The art tour was superbly organized to include museums, galleries, private collections, and visits to artists’ studios. Suzanne Paulson of Laguna, California, and Clarisse Gagnebin of Zürich were the organizers of the very smooth-running experience, complete with gourmet meals in Zürich and Basel and surroundings. Within the familiar territory (for me), there were exceptional treats, e.g., the Hallen für neue Kunst in Zürich, now one of the world’s premier contemporary destinations, and the Basel Art Fair. When we visited the world famous Galerie Beyeler in Basel, Herr Beyeler perceived that members of the group were knowledgeable and appreciative of both modern and contemporary art. He guided us to a well-protected warehouse where his “excess” paintings were stored, and he rolled them out one by one for our viewing. It was an unimaginably lucky experience. Many of those paintings are now hung in the Beyeler Museum that he later created. Two funny incidents in Basel are worth relating. When we were visiting the 14<sup>th</sup> century square that had withstood Basel’s great earthquake, I sat on the edge of the central fountain while listening to an historical exposition. Unbeknownst to me, the back of my coat, which was dipping in the water, acted like a wick and became practically saturated, much to the amusement of my fellow travelers. What amused me in the second incident was the Californians’ reaction to riding in the same elevator with Elizabeth Taylor, the movie actress, at the Hotel der Drei Könige, where we stayed in Basel. For some of those movie fans, it was the highlight of the trip.

The highlight of my summer, 1991, resulted after a drive from Dunewood, Manistec, to Desbarats, Ontario, Canada, where Peggy’s forebears had bought part of an island, Campement d’Ours (Home of the Bears) in 1904. A variety of living structures had been built on the island and sporadically improved over the subsequent years. The island is one of the group in the North Channel that flows out of Lake Superior, through the locks at Sault Ste. Marie, into Georgian Bay and Lake Huron. It is a boat-dependent community—outboard motor boats, sailboats, and

Sunfish, canoes, and kayaks. The isolation and natural beauty, actually rather wild beauty, make the setting and the living there unique. My introduction to the island was via Peggy's outboard motor boat, the *Lady Di*, after we had met by arrangement at Holder's Marine on the mainland, where I parked the trusty Toyota for my period of stay. We were met on the island by son Taylor, and his partner Gary Sanders. Taylor, "everybody's best friend," had been the moving spirit behind the building of most of the structures at Campement d'Ours West, as the compound came to be called. I was treated to exploratory walks and boat rides to appreciate the marvelous scenery and to meet the many friends-since-childhood and relatives of Peggy. I was attracted to swimming in the cool water, which consisted mainly of diving off the boat dock and floating with the current that sweeps past the island. I felt it was truly a place for renewal of the spirit, much as Duncwood was on a smaller and more limited scale. I felt at home and was made to feel at home, and I hoped to be invited to return.

A more immediate invitation had come from the Chemistry and Chemical Engineering Division of the California Institute of Technology in Pasadena for me to be a Fairchild Scholar during the fall semester, 1991, which I gratefully accepted. The appointment would provide me with an office and the opportunities to attend seminars, to confer with the faculty members, to write, and to use the library and other facilities on campus. In anticipation of our being together and among chemists as well as art and music lovers, I had convinced Peggy to accompany me to an American Chemical Society meeting in Atlanta, Georgia. She would thereby have a sampling of the chemists who attended the meeting, including my friends and former students. I must say that the rather large sampling of chemists was uniformly pleased to see me in the company of the lovely lady, and Elkan and Gail Blout in particular. On September 1, 1991, Peggy helped me celebrate my 75<sup>th</sup> birthday with all the children, spouses, and grandchildren during a weekend on Mission Bay, San Diego.

In the spring of my first year at Caltech, 1991-1992, we skied in Vail, Colorado, with Stan and Barbara Cristol and in Snowmass at an Aspenyl Chemistry meeting with the Büchis (MIT), Whitesides (Harvard), Crams (UCLA), Ōkis (Japan) and Roberts (Caltech). I was invited to visit Desbarats again in the summer after I had returned from various conferences and had spent enough time in Urbana to guarantee that my research was on track. It was five years since Nell had died. As I stood in the room on the first floor of the addition to the house that had been constructed in 1962, I pondered the question of my future. In a serious

final conversation, I told Nell that it would be impossible for me to marry anyone else. She thought it would be possible; moreover, it would be a younger woman who would “qualify.” Peggy is 10 years younger than I. Did I have further obligation to Nell? Did I have further obligation to the family home? What would my children think if I married again? I concluded that if I found someone who would make me happy and whom I loved and could make reasonably happy, they would approve and they would welcome her. All of them had told me how much they liked Peggy at the birthday party the year before. I resolved to propose to Peggy, and I knew just where I would do it.

I started out (July 1992) in the Toyota from Manistec early in the morning, driving east on M55. In the excitement of meeting Peggy in 200 miles, that is, just the other side of the Mackinaw Bridge on the upper peninsula where she would be delivered by speedboat by Taylor and one of his friends, my foot depressed the gas pedal too hard. I was going about 65 miles (or more) per hour when a police car, driving west, the only other car on the road, was obviously checking my speed by a radar gun. We passed each other. I slowed down, pulled over, and stopped when I saw that he was turning around. He lifted my license but gave me a receipt and a lecture. I would be able to pick it up again within two weeks in Manistec when I paid my fine. He was not interested in learning why I was driving so fast or how inconvenient the license bit could be since I was going to Canada. The speed limit on a two-lane Michigan state highway was 55 miles per hour (enforceable)!

Well, Peggy and I met in St. Ignace, MI, as planned, although I was a bit late, which was more understandable to me than to Peggy and Taylor.

Desbarats and the island were just as I had remembered. On the third morning, weather was conducive to an early paddle. When we circled around and drifted silently toward our favorite beaver house, I said, “Oh, Peggy, I’ve been meaning to ask you: will you marry me?” Her answer surprised me, “I’ll have to think about it.” We paddled back to the dock (about 100 yards), hopped out of the canoe, and she announced, “I’ve thought about it!” What exhilaration and relief! The rest of the day was spent in making arrangements for the wedding, but we did not tell others until we had alerted our families as to what was occurring. Was our inner happiness showing during that time in Desbarats? Probably. Now we were aiming at an important date, November 14, 1992, with Rev. George Regas officiating. In our only counseling session, he asked me to describe my first wife and seemed satisfied, after my lengthy answer, that Peggy would be marrying a worthy character, who had known what love and marriage were about.

There were other trips to be taken between the proposal in July and the wedding in November. In fact, we combined them in one major adventure that started in Switzerland, where Arnold and Hanni Brossi were our hosts in Laax in the Graubunden for nearly a week of chemistry and hiking/sightseeing. We had chemistry talks in the morning, hiking, sightseeing, and mushroom-gathering in the afternoon, and feasting in the evening. Jack and Edith Roberts were there, also Bernard Witkop, who had been my mentor—along with Arnold—when I was the National Institutes of Health, Jerszy Wrobel from Poland, Miroslav and Ludmilla Protiva from the Czech Republic, and Yoshio Ban from Japan. The weather was perfect, and Peggy obtained some beautiful pictures from the top of the funicular at Flims-Laax, the dahlia farm down valley, the church at Fellers, and during a day trip to Lugano. The big surprise was a 76<sup>th</sup> birthday party on September 1<sup>st</sup> at Tegia Larnags, complete with fondue and a birthday cake, and only possibly surpassed by the farewell dinner at Flims at the Sagogn Restaurant Da Veraguth Carnatg. These restaurants will last long after I am gone; their names and locations will still serve as strong recommendations.

## Marriage



NJL and Peggy Phelps, wedding, 1992

Of course, the best event of 1992 was the wedding of Peggy Phelps and Nelson Leonard on November 14. Both families were 100% in attendance. Peggy found houses of friends that they could occupy. Taylor Phelps thought the children and grandchildren should get to know each other, and this was accomplished by a pool party at the home of Richard and

Mary Alice Frank, old neighbors and longtime friends. In the meantime, Elkan and Gail Blout and I enjoyed a relaxing time pool-side at the Ritz Carlton Huntington Hotel in Pasadena. We all gathered for the family service, and that it was. Reverend George Regas, Peggy and I were surrounded—at his encouragement—by all of the grandchildren so that they would have the feeling of participating in the ceremony. No

## MORE THAN A MEMOIR

invitations were sent out to Peggy's friends, but five of her closest buddies crashed the ceremony after telling her that they could not be excluded. The bride of course looked beautiful! The groom became uncharacteristically a bit teary when he gazed into her eyes while he was saying his assigned words. The bells and the organ kept the children happy and singing—at least some of them. A reception was catered in the patio of 389 California Terrace. Paul Renardel de Lavalette, Nell's nephew, represented the Dutch side of the family, and many Pasadena friends were there. They made a real dent in the wine cellar when it was discovered what vintages Peggy was serving. Emmie, a stray black cat with emerald eyes, made an appearance on the roof to survey the party in progress. I tossed her a shrimp. From that time, she became a frequent visitor, deigned to eat cat food that we placed on the roof for her, and even allowed me to pet her once in a while. Sallie and Harry Colmery and KB and Chris Schwarzenbach jointly hosted a party for us on the following day, when we were greeted by a huge and joyous crowd of friends. Then, I left to attend a symposium at the National Institutes of Health in Bethesda, Maryland, that I had been asked to organize. What, no honeymoon? Oh, yes, that followed in New York City where I met Peggy, and we indulged ourselves in good food, plays, and visits to our favorite museums. Then, it was back to Pasadena to catch up with normal living.

### More Travels—1993

The summers of 1993 and beyond produced a pattern of travel that included a stay in Desbarats, Canada, and, for me, a visit to Dunewood, Manistee, Michigan, to catch up with my families.



NJL with Peggy and family, Desbarats, Ontario, Canada



Friends since kindergarten, NJL and Allan Van Cott, Pasadena

In late October of 1993, Peggy and I flew to Hong Kong, where we stayed at the Grand Hyatt Hotel and enjoyed the pleasures of the city recommended by my Caltech colleague, Sunney Chan. After three days on our own, we joined an **Eastern and Oriental Express Tour** sponsored by the Illinois Alumni Association. It was well organized by Jim and Dorothy Diorio, but we really did not become well acquainted with anyone else on the trip. We flew from Hong Kong to Bangkok and directly to Chaing Mai, Thailand. From Chaing Mai, we toured the countryside, observing the temples, an orchid farm, a furniture-building installation, and, most enjoyably, an elephant farm where we watched the elephants being trained to haul timber, being washed and scrubbed, and finally giving tourists a ride. I have been told by recent tourists that the particular farm we visited is no longer in existence, alas.

After two days, we flew back to Bangkok, where we stayed in the Oriental Hotel, not the old one of fame but the new luxurious version, also directly on the river. The river traffic was fascinating; we never tired of watching the barges and native craft of all sizes. We were treated to a tour of the canals (kungs) of Bangkok in one of the long boats, from which we could see how the people lived and could view the Grand Palace and the Buddhist towers (Wats) rising on the skyline. We saw the house of Jim Thompson, an American architect and designer, who had settled in Thailand after the Second World War and had revived the craft of the hand weaving of silk cloth. The most amusing furniture in the structure was, in fact, the mouse house. We spent two nights on the Eastern and Orient Express in elegance and comfort en route from Bangkok through Malaysia to Singapore. The rate of speed was slow enough to provide a smooth ride and to permit viewing of people and scenery, whether from our bedroom or from the open observation area. Singapore is a very special city-state, worthy of a visit for the old and the new. When we were visiting the beautiful Anglican Cathedral in Singapore, we seemed to get involved in a sumptuous Chinese wedding. I am sure there will be some unrecognized "relatives" in the occasional snapshots that were taken. Our final dinner, a delicious one, was in the famous Raffles Hotel.

## 1994

Peggy, who had been on the **Fellows of Contemporary Art Hudson River Art Tour** in 1990, was delighted when it was scheduled to be repeated in April 1994 and that I could have essentially the same experience. The 1994 tour included museums in New York City: Whitney, Guggenheim,

and in TriBeCa, a collection of the huge concentric cylinders of Richard Serra. Tours of private residences and commercial galleries were interrupted in timely fashion by excellent lunches and dinners in carefully selected restaurants. The greatest treat was going up the Hudson River to Nyack on the yacht that Jack Kennedy had owned when he was President. A new world (for me) emerged as we saw the estates of Rockefeller, Vanderbilt, and Roosevelt, and the Storm King Sculpture Park, with a collection featuring the work of master sculptors such as Calder, di Suvero, Nevelson, Noguchi, and David Smith. In a visit to the studio and home of George Riekey in East Chatham, New York, we were most delighted with his metal installations, all shining and delicately balanced, moving in even the slightest breeze. [They become friends when one discovers them around the world and as far away as New Zealand.] The trip ended in territory that was familiar to me, namely, Katonah, New York, at the home of an art scholar and historian. Katonah and, more specifically, Lake Katonah was where my Aunt Kate and Uncle George had a cottage (“camp”) and I used to spend many happy weekends when I was growing up in Mount Vernon, 35 miles away. I had not been back to the area since 1947, although I did inherit the little house and held it briefly when my aunts later died. Daughter Marcia appeared in Katonah—now in 1994—to drive us to Maplewood, New Jersey, for a brief stay. Then it was home to Pasadena, California.

England is at its most beautiful in October, and so it was during October 1-15, 1994, for our ARTexpress London Art Tour. Our London abode during this period was the Four Seasons Regent Hotel, a beautifully restored Victorian building that had originally housed the offices of British Railroads. Other historic buildings were viewed during a full-day tour by bus, guided by the architectural historian Victoria Thornton and including a visit to the studio and home of Richard Rogers, one of Britain’s foremost architects. For my readers and for reminders to myself, it is probably sufficient to list the museums and galleries, the sculpture exhibits, and the studios that were on our itinerary.

Museums and Public Galleries

*Design Museum (Butler’s Wharf)*

*Dulwich Picture Gallery*

*National Gallery (Sainsbury Wing) (Artist in Residence—Peter Blake)*

*Royal Academy (Dinner and Private Viewing)*

*Serpentine Gallery*

*Tate Gallery*

*Whitechapel Gallery*

Sculpture

*Henry Moore Foundation, Much Hadham, Hartfordshire*  
*Roche Court Sculpture Garden (Lady Madelaine and Arthur Lord Ponsonby)*  
*Yorkshire Sculpture Park (Peter Murray, Director)*

Studios of Famous Artists

*The Boyle Family*  
*Anthony Gormley*  
*Anish Kapoor*  
*Henry Moore*

In addition to the sites visited, we went to the galleries of dealers and to fabulous private collections. Visits to the Greenwich Observatory and to Oxford were included in the tour. The new venues for me in Oxford were the Christ Church Picture Gallery, the Museum of Modern Art, and the refurbished Ashmolean Museum. We were treated to lunch in the Senior Common Room of Magdalen College with my ex-colleague Robert Denning and to tea at my old friend Rodney Parsons' home, returning to London speedily with Michael Parsons.

On an art tour of our own over Thanksgiving in 1994, Peggy and I stayed at the Inn on the Alameda in Santa Fe, New Mexico. We ate well at the highly recommended restaurants and inspected the many galleries on Canyon Road. We spent quality time in the Museum of New Mexico, the American Indian Art Museum, and the Folk Art Museum as we walked all over this postcard town. Our rented car took us out to the Frauenfelders' new house in Taos and to the villa of the famous (or infamous) Mabel Luhan. Her full name was Mabel Ganson Evans Dodge Sterne Luhan, "a name that duly honors her four husbands but slights her lovers" (Jack Smith, *LA Times*, August, 1988). Mabel's first husband was Peggy's grandfather's brother and her last was a full-blooded Taos Indian, Tony Luhan. Mabel established a salon in Taos that supported art and literature, and she was most noted for her cultivation of D.H. Lawrence and, unfortunately for Mabel, his accompanying wife, Frieda.

## 1995

Peggy had not recovered fully from breaking her leg skiing in Aspen in February but when K.B. and Chris Schwarzenbach encouraged us to join them on a National Parks tour of Montana by Private Rail scheduled for June 20-28, 1995, we anticipated that Peggy would be able to manage it.

That she did, with some assistance. The National Parks Limited consisted of seven luxurious passenger cars, built between 1942 and 1955, privately owned and completely refurbished. Most appropriately, our guide and lecturer was Alfred ("Al") Runte, author of a number of books about the National Parks and, especially, the Western railroads. One of the representatives for the National Parks and Conservation Association was Jessie Brinkley, with whom we became good friends.

The initial tours by bus out of Billings took us to the Little Bighorn Battlefield National Monument and to Pompeys Pillar, a great rock formation overlooking the Yellowstone River and a stopping point for William Clark's exploration up the Yellowstone River. We entered Yellowstone National Park over the spectacular Beartooth Highway, stayed overnight in Canyon Lodge, and exited to the north to Livingston after viewing geysers, waterfalls, and abundant wild life. The fabled train was waiting in the Livingston Depot which has an adjoining Train Museum that displayed (oh, joy!) the legacy of the Northern Pacific Railroad. From Livingston, the N.P. Limited took us over the Bozeman Pass, a major feat of railroading, for Bozeman in the morning and Helena in the afternoon. Along the way, we were treated to two side trips that commemorated the Lewis and Clark Expedition. One was the Missouri River Headwaters, situated at the confluence of the Jefferson, Madison, and Gallatin Rivers, where Lewis and Clark spent several days searching the three rivers for the best route west. The other was the Gates of the Mountains, so-named by Lewis, the section of the Missouri River that runs through a deep gorge. We were in a motor launch. Looking upstream, huge walls of mountain seemed to block our passage until we steered to the south side of the river and could see that there was indeed a continuing passage through the cliffs. It must have been a dramatic moment for Lewis and Clark if it was for us!

In Helena, the state capitol and home to the Montana Historical Society Museum, we viewed original art of C.M. Russell and F.J. Hayes' photographs of the early Northern Pacific Railroad days. In Garrison, a stop at the site of the 1853 Grant-Kohrs Ranch was especially memorable because K.B. Schwarzenbach had spent some summers there when she was young (in the 20<sup>th</sup> century!) and the train then continued to Missoula for an overnight. Peggy returned to Pasadena because of obligations, but I stayed with the group bound, after a tour of the Smokejumper Training Center of the U.S. Forest Service, for Glacier National Park and the Glacier Park Lodge. "Jammers," the old, traditional park vehicles took us on a full day tour of the park. I was finally able to travel the Going-to-the-Sun Highway east to west through the heart of the park

and to see Marias Pass, the lowest mountain pass between Canada and Mexico and the route of the Great Northern Railway across the Continental Divide. Mountain goats joined me in inspection of the area. Home was reached by motor coach to Kalispell and airplane to Los Angeles. I believe one could never tire of the experiences and beauties of Glacier Park.

## 1996

Packed into 1996 were trips that would have been satisfying for a lifetime. Even the first of our journeys (May) was wish-fulfilling: French Polynesia, and even the first leg of the first journey satisfied a desire: Air France, in first-class beds, with comfortable colorful pajamas provided, to Papeete. There we were given further time to rest at the Tahiti Beachcomber Hotel, which merits a return, and an opportunity to tour the port. The WIND SONG was to be our home at sea for a week, a three-masted sailing ship with three diesel electric auxiliaries. Our ports-of-call were the islands of Huahine, Raiatea, Bora Bora, and Moorea. The sailing was smooth, thanks to stabilizers and anti-heeling ballast tanks that limited leaning. We encountered “large” (20-foot) waves only during the final night’s journey from Moorea to Papeete. The main focus of the tour involved cultural aspects of the islands and sporting adventures in the shallow sheltered lagoons. Peggy was already a pro at snorkeling, but I needed instruction. The WIND SONG furnished the gear, and outriggers brought us into the lagoons and inlets. The early exhilaration reached exultation as we progressed in our at-ease floating among the coral and tropical fish, then circling black-tipped sharks (being fed), and finally gentle sting rays (being fed) that we could stroke. Island tours at will provided unforgettable views of mountains; plantations of vanilla, tropical fruits, and flowers; and Polynesian Tiki and temples—a happily-remembered journey.

At the beginning of June, we flew to the home country, more specifically the Côte d’Azur with the Fellows of Contemporary art. Our “home” in France was an enchanting villa hotel, Le Mas Candille, near the village of Mougins. Under the guidance of Suzanne Paulson, Connie Glenn, and Clarisse Gagnebin of Zürich and with transport in a small bus, we visited every art site within range. We saw these treasures of Provence:

The Maight Foundation and the restaurant Colombe d’Or in Saint Paul de Vence. I was happy to walk around St.

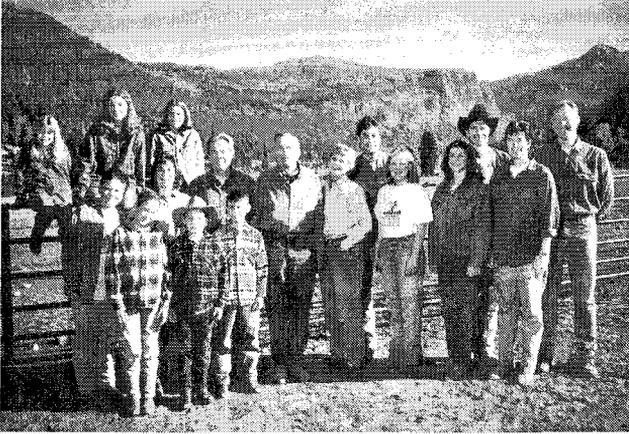
## MORE THAN A MEMOIR

Paul de Vence because my father-in-law Henri Vermey and Jacqueline, his second wife, used to spend winters there.  
The Matisse Chapel and the home of Marianne and Pierre Nahon in Vence  
The Museum of Modern and Contemporary Art in Nice  
The Matisse Museum  
The Chagall Museum  
The home and studio of Ben, the artist (a clutter of found objects)  
The home of Bernard Venet, sculptor  
Villa Ephrussi de Rothschild in Cap Ferrat  
Chapelle Saint-Pierre in Villefranche  
The Musée nationale Picasso in Vallauris

That part of the trip ended with the best meal of all time in Le Moulin de Mougins. Peggy then rented a car and drove fearlessly along the spectacular road on the cliffs along the Ligurian Sea to Portofino, Italy, where we stayed one night (we could afford one) in the Hotel Splendido. The name of the hotel says it all, and we now compare all hotels to this magnificent one. The next goal was to drive to Florence and to treat Nelson to his first Florentine experience. Our hotel was the Tournabuoni Beacci, or, simply, the Beacci. Our room, which was air-conditioned, faced the Ferragamo Palazzo. It was but a short walk to the Piazza Antinori, where, in the Palazzo Antinori, Peggy could introduce me to some of her very special relatives. The rental car was turned in, and we walked everywhere, making it a habit to be at the museums, etc., at opening time, or at least early, and take a siesta after lunch, gather strength, and be appreciative tourists again. Am I going to tell you what we saw? No. Am I going to tell you the affect Florence had on me? No. It is now part of my conscious being, enriched by the young wife who led me around and watched my reactions. My advice to everyone is to go to Florence! Did I tell you that we met friends of Peggy's there? We did. Don't we always in the most artistic venues in the world?

During August 25-September 1, 1996, the 17 members of the family gathered at Wilderness Trails Ranch, Durango, Colorado, in the "Four Corners" area. The decision to celebrate my 80<sup>th</sup> birthday at a dude ranch was by vote of the family. Barbara Leonard did the research that resulted in the selection of WTR, run by Gene and Jan Roberts. We all arrived in Durango on August 24, stayed in the Durango Lodge, and rode the Durango and Silverton Narrow Gauge Railway that follows the Animas River. The train ride provided a spectacular introduction to our Colorado week, with its legacy of mountain railroading that dates back over 120

years. After a walk around Silverton, we returned by bus to Durango in time to be picked up and transported to the Ranch, where we were distributed, by individual families, in separate log cabins. Boots were rented, horses were assigned (mine was Satan) on the basis of stated and observed riding skills, from “Sidekicks,” to “Trailhands,” and up to Trailblazers. Peggy and I had done some practice riding in Aspen during the previous week, so that we could rank among the “Trailblazers.” The main purpose of being at a dude ranch is to ride, and that we did! The youngest members of the clan received instruction and had close supervision each entire day.



NJL's 80th Birthday, Durango, Colorado

The length of the trail was balanced according to each person's riding skill. The Trailblazers had one all-day ride that took them through the forest to a promontory high above the Pine River. The Sidekicks could be observed frequently, filing through the Ranch grounds, following their leader and chatting all the time. I was thrilled

to see their joyful commitment to riding and to recognize the skills, developing or achieved, of all the family members. There were also hikes and jeep trips to be enjoyed. A visit to Chimney Rock Archeological Area brought us into the history—as much as is known—of the Anasazi people. The grandchildren had the opportunity to learn about general woods sense, arts, and crafts, and there was a swimming pool. At the nourishing Western meals, Jack, Jamie, and Julianna ate with their leader; Corinne, Michael, Valerie, and Zena ate with other teenagers. The adults distributed themselves however they wished. A variety of evening entertainment graced the evenings: campfires, sing-a-longs, western dancing, hayrides, and a staff show. On the last night, there was a surprise birthday cake for the 80-year-old. The rocket candles were hard to quench. The enthusiasm of the clan couldn't be quenched as they sang—in a separate cabin set aside for us—their “Nelson Leonard's 80<sup>th</sup> Birthday Round-Up Song,” reproduced here for posterity at the children's request.

**Nelson Leonard's 80<sup>th</sup> Birthday Round-up Song**

- All sing:           Come gather round folks and listen to our tale of a man  
                          turning 80 here at Wilderness Trails.
- All sing:           Born in 1916, on September first,  
                          Newark, New Jersey, is the place of his birth
- All sing:           Come a ti yi yippie yippie yay yippie yay  
                          Come a ti yi yippie yippie yay
- All sing:           At five years old he started in school.  
                          He was pretty darn smart, he was nobody's fool.
- Ken:                Now here's something special I'll tell you about.  
                          Dad made it all the way to Eagle Scout.
- All sing:           {Chorus}
- Marcia:           After Lehigh U. he gave Oxford a whirl  
                          He studied and rowed and he met a special girl.
- All sing:           After World War II, he took Nell for his wife and they  
                          loved each other for the rest of her life.
- All sing:           (Chorus)
- K, M, J, D:  
Kids:                They had four kids who were pushy and rude,  
                          But their grandchildren are a might fine brood.
- Jim:                Somewhere along the way Dad had to pick between his  
                          singing and his chemistry schtick.
- All sing:           (Chorus)
- Dave:                He was fond of Ben Gay and used Brylcreem  
                          He snorted Vicks so he could sleep and dream.
- All sing:           He spent 44 years at the U. of I.  
                          Where the land's so flat and the corn's so high

- All sing: (Chorus)
- 4 women: He's a double Gugenheimer with a passel of degrees, and he's published more papers than the Rockies have trees
- 4 men: He's a handsome man but the women all know looks don't count [it's the fluorescent probe.] (spoken)
- All sing: (Chorus)
- All sing: He's traveled the world from east to west from the Great Wall of China to Budapest
- 7 kids: He goes by car, by boat and plane, but his favorite way to travel is choo choo train
- All sing: (Chorus)
- Adults: You never have to wonder just where the man goes,  
He sends itineraries to everyone he knows.
- K, M, J, D: He collected ticket stubs from hither and yon.  
He put 'em in our pockets and said, ["Pass it on!"] (spoken)
- All sing: (Chorus)
- Jim, Dave: Well, subtle humor really isn't his thing  
His puns are as bad as his best golf swing.
- All sing: He hikes and he bikes and he does it with ease.  
He's a fish in the water and a devil on skis.
- All sing: (Chorus)
- Ken, Marcia: So if you're on the Burn and hear a yodel call, it's just Dad  
shushing down a double diamond wall.
- 7 kids: But after lunch, don't yell, don't yap.  
'Cause Opa's gotta have his afternoon nap.
- All sing: (Chorus)

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- All sing: He can't eat onions or peppers or cukes.  
If you serve them to him, he just might puke.
- Jim's family: He's the kindest man you ever could meet.  
He's loved by all—on two or four feet.
- All sing: (Chorus)
- Dave's family: Well, there isn't very much that makes Opa irate.  
Don't call him Leonard Nelson and you'll get along great.
- Marcia's family: The only other thing that makes Opa blow is when young  
people say, ["Like, you know"] (spoken)
- All sing: (Chorus)
- Ken's family: Now he's married to Peg and they live in Pasadena in the  
most art-filled house that you ever have seen-a.
- Barb: Modern art doesn't make Nelson pale.  
He likes Matisse, Stuart Davis, and Nikki St. Phalle.
- All sing: (Chorus)
- T, M, J, D: When it came to fashion, Dad wasn't really dapper.  
Peggy took one look and threw his clothes in the crapper.
- All sing: Now he's riding Satan and taking in the scenes, looking  
mighty fine in his first pair of jeans.
- All sing: (Chorus)
- All sing: He's gathered his family from across the nation to come  
to Colorado for his birthday celebration.
- All sing: So raise your glass to Nelson there—he's got most of his  
wits and all of his hair.
- All sing: (Chorus)

*Guitar Accompaniment—Jonathan*

A Chicago Art Tour with the Fellows of Contemporary Art occupied us happily during October 2-6, 1996. Highlights of the tour included visits to the new Chicago Museum of Contemporary Art, the Chicago Cultural Center, the Art Institute of Chicago, and the Frank Lloyd Wright studio and home, together with a bus tour of the houses in Oak Park that he designed. We were appreciative guests in a number of private homes and studios where we could see a variety of contemporary art and sculpture collections. A walking tour of commercial galleries was interspersed with gastronomic delights in Chicago's most representative ethnic restaurants.

A bit later in October, we treated ourselves to a weekend in Carmel and San Francisco by airline and rental car. The Monterey Bay Aquarium, the most spectacular I have seen, has galleries that front on the Bay, showcasing the life of the Pacific Ocean in an ever-moving, ever-changing tableau. Exhibits of sea otters, creatures who inhabit the kelp beds, sharks, hypnotizing jellyfish of great beauty and intricate design, turtles, and sea snakes combine to make the hours rush by. 'There are fish from the seven seas. And in San Francisco we ate fish to our palates' content in between walks and sessions with modern and contemporary art.

It was a Peggy-sponsored family trip to Kauai in the Hawaiian Islands for Thanksgiving that rounded out the peripatetic year. After landing at the Lihua Airport, we traveled by rental car north along the Royal Coconut Coast through Kapaa, Anahola, Kilauea, and Hanalei to Haena, on the north shore. For lodging, we were distributed between a rented private house on the beach and Hanelei Colony resort. Makua Beach is known as "Tunnels Beach" by the surfers, and the surf, especially out at the first break, is impressive. We were satisfied with the smaller waves breaking on the steep coral beach. We hiked the Kalalau Trail,



A Christmas in Snowmass

a dramatic up-and-down exercise along the NaPali Coast. It must be said that the older family members did not keep up when the coastal ascents became too steep and slippery. We could do double-kayaking in the river nearby, touring by yacht into the shore caves and alongside the cliffs, viewing mountain falls, canyons, and craters from helicopters, and visiting plantations,

botanical gardens and wildlife preserves. For some reason the predominant snapshots of Nelson on this holiday seem to be those where he was sleeping in a hammock on the beach. What happened to all the reading material he brought along? Thanksgiving dinner appeared by feminine magic for the very congenial and happy assembly. Next time on Kauai, we shall inspect the southern and southwestern areas of the island, more populated but providing a different beauty.

## 1997

I have been omitting descriptions of various international trips that I took to attend chemistry meetings and symposia that were due in part to my profession and in part to my membership in the International Union of Pure and Applied Chemistry and past offices therein. A meeting in June, 1997, however, seemed rather special because it was scheduled for Biarritz, France: the IVth International Symposium on Bioorganic Chemistry. It was in a series that I had helped to initiate and for which I still felt some responsibility. Almost all air travel to France proceeds through Paris, which is where I met my old friend Elkan Blout for a fancy lunch and some quick sightseeing along the Seine that included l'Hotel Dieux, which is now a teaching hospital that dates from Napoleon's time. Elkan's friend, and the father of one of his former postdoctorates, Professor Gilbert DiMaria, drove us to his country house about 50 km. east of Paris for a fabulous picnic supper. The taxi driver then took me on the back roads to Paris-De Gaulle so that I could view the old battlefield area of the first World War along the Marne River, which is now peaceful farm land and a piece of forgotten ugly history. I reached rainy Biarritz late at night on the same day I had arrived in Paris. In Biarritz, I absorbed chemistry along with delicious food and wine, and I enjoyed walking the beach, musing about how it all might have been at the height of its popularity in the 19<sup>th</sup> century.

Peggy and I converged on the Allentown-Bethlehem (PA) airport from Paris via Washington, D.C., and from Los Angeles via Washington. We were guests for three nights at the home of (Professor) Jack and Debbie Haight in Bethlehem while we attended the Lehigh Reunion with my class of 1937. I could show Peggy my favorite haunts of 1933 to 1937, and we participated in the usual—or unusual—events of a college reunion. In this case, they included a parade, a general luncheon with an address by outgoing president Peter Likens, a guided campus bus tour, and a class dinner, 18 members in attendance. We spent a very agreeable time with Jack and Debbie, he being a Professor of History and she being on the

board and a docent of the Allentown Art museum among her many activities in the community. I had a interview with a student, Barbara S. Lee, who wrote in the Lehigh Alumni Bulletin, Reunion Edition, 1997, a gracious article entitled "A Lifetime of the Right Chemistry."

September 24, 1997, found us in Istanbul, Turkey, for a 7-day trip to the Greek Isles on the WIND STAR, sister ship of the WIND SONG that had been our sailing home in 1996 in French Polynesia. We arrived in Istanbul three days early in order to adjust to the time difference and to see the wonders of Istanbul past and present. The private tour of the capital, which had been arranged by our hotel, the Istanbul Conrad International, and was comprehensive, received a demerit or two for the final apparently obligatory stops. (1) In answer to our reply, "Yes, we would like to stop for an apple tea," we suddenly found ourselves in a rug merchant's shop, where we were provided with that refreshment. We had to view acres of rugs despite our insistence that we did not want to purchase a rug. The merchants were not charmed with our appreciation without purchase. (2) In answer to our reply, "Yes, we would like to view the open market," we were led to the guide's cousin's shop, where we felt more comfortable after I had purchased a small piece of gold jewelry, a ring for Peggy. Be prepared for a hard sell in Istanbul! A boat tour of the Bosphorus was more instructive and more relaxing.

We boarded the WIND STAR on Saturday, September 27, and spent Sunday at sea, passing through the Marmora Sea, past Gallipoli, the site of ancient Troy, and the Island of Lesbos, to awake Monday morning at the Turkish port of Kusadasi. There we saw the most-often photographed structures of the ancient Greek city of Ephesus and had a great walking day along the marble streets and among the ruins, in part reconstructed. The next port-of-call was Turkish Bodrum, the ancient Halicarnassus, where our itinerary included a walk around the harbor and visits to a mausoleum and a castle that is now home to the Museum of Underwater Archeology. We crossed to Rhodes, the capital of Greece's Dodecanese Islands, where there are ancient and medieval archeological areas of interest. From here on, the sun was always with us, but the waves were high as a result of an earlier storm pushing them down from the north of the Aegean Sea. In Santorini, we anchored in the harbor, which is really the caldera of a volcano that blew up. Fable has it that the island was Atlantis, the ancient "continent" and civilization that was destroyed. On land, we could explore the ruins of the Minoan city Akritiri and "climb" by cable car to the island's mountain-top capital, Thira. My favorite experience, however, was swimming and floating about off the stern of the ship, reveling in the clear, dark blue water and thinking about the uniqueness of being inside a volcano's old caldera.

## MORE THAN A MEMOIR

The waves became smaller, with the result that we could sail north to Mykonos in the Cyclades Islands and proceed by smaller craft to the sacred island of Delos, birthplace of Apollo, with its countless temples, shrines, and artifacts. The island of Mykonos, where every building is painted blue and white, is spectacular and makes the most lasting impression. Fortunately it doesn't have to be described in detail because one sees photographic representations on all posters and in all flyers urging travel to the Greek Isles. The final leg of the journey took us to Piraeus, where we disembarked and transferred to our hotel in Athens, the Athenaeum Intercontinental, for a final day of sightseeing that included the Parthenon and Acropolis, the Museum, plus everything else we had the energy left to visit.

Home for a month, we were on the move again in November with the Fellows of Contemporary Art, organized by Suzanne Paulson. The target: New York! New York! We viewed private collections and private galleries: C and M Arts, PS 1 on Long Island, and the Dia Center for the Arts. A visit to the Museum of Modern Art was especially meaningful because our tour of the Egon Schiele Exhibition (dates 1890-1918) was guided by Patterson Sims, Director of Education and Research, following an introduction by Curator Magdalene Dabrowski. At the Whitney Museum, we were met by director David Ross, and we toured the Diebenkorn Exhibition and the new museum staff offices. At the Guggenheim Museum, we toured the show representative of five decades of a defining force in contemporary art: Robert Rauschenberg: A Retrospective, which was continued in the Guggenheim Museum SoHo. Add to these adventures visits to artists' and sculptors' studios, inspection of commercial galleries on West Broadway and in Chelsea, plus lunches and dinners in ethnic restaurants for a complete record of our busy week. Of additional personal pleasure was a dinner with Marcia and Tom at a favorite restaurant, Aureole. Peggy had the special experience of climbing up to watch our friend Robert Duerr play the carillon at St. Thomas' Church.

## 1998

The Fellows of Contemporary Art were off to Spain in May, 1998, for a spectacular compression of centuries of art and architecture. The starting point of our trip was Santiago de Compostela, which was reached via Miami, Madrid, then back to Santiago via Iberia Air Lines accompanied by our tour leader, Consuelo Gallego, and our contemporary art lecturer, Mar Estrada. We were given time to relax and then assemble in the courtyard

of our Hotel de los Reyes Catolicos, on the same square as the famed Cathedral. A lecture on the Pilgrimage Way to Santiago reminded us that during the Middle Ages it was the third most important city for pilgrimages because it housed the bones of St. James. We were also reminded, by the folk dancers and musicians who entertained us, that Galicia in the Northwestern corner of Spain, was Celtic. The Romans had not been able to subjugate them, as they had not the Celts of Ireland and Scotland. Bagpipes and jigs provided the reminder of the early origins of the inhabitants. After a special Galician dinner, we were treated to minstrel singers and songs of the troubadours, bringing us up to the Middle Ages. The Parador, the Cathedral, the Library of the University of Santiago de Compostela, and the courtyards in the city gave us a Renaissance experience, and the Contemporary Art Museum brought us back to the 20<sup>th</sup> century. The lack of any discussion of the Inquisition caused me to buy (when we returned home) a definitive history of the Spanish Inquisition, which was actually centered more on political power than on religion.

Our pilgrimage took us, via Iberia and “bookend” bus rides, to Bilbao and its defining Guggenheim Museum Bilbao designed by Frank Gehry. It is the first structure in a general rejuvenation plan for the river-front of Bilbao. Outside, it is fascinating when viewed from any direction and in any light. Inside, the space, the curves, and the layers of the building combine to provide new visual experiences that are unequalled anywhere, past or present. The space soars. The installations on display in our time in the museum included the shuttlecock of Claus Oldenburg and a huge snake of Richard Serra.

A bus ride took us to Guernica, notorious in history because this central Basque market city was bombed by the German Air Force in support of General Franco on April 26, 1937 during the Spanish Civil War. The carnage of man and animals in the civilian market place has been symbolized by Picasso’s painting, “Guernica,” for us all to remember the fascist brutality experienced during that war and thereafter. The site has been transformed into a peace park with sculptures by Henry Moore and Eduardo Chillida. Remains of a famous oak tree indicate where the ancient Basque Parliament met. A nearby 14<sup>th</sup> century church that escaped destruction offered a place and time for quiet reflection. San Sebastian was our goal on the following day. This charming seaside town was the summer residence of the Spanish royal family during the 19<sup>th</sup> century and up until 1930. It is now a town of spas. A walk around the old quarter brought us to our destination, San Telmo, a former monastery and church now converted to a museum. Eleven huge canvases by Jose Maria Sert

depict the life and history of the Basque people, including their activities, deeds, and beliefs. Along the beach there were wind sculptures, the Wind Combs, of Eduardo Chillida, who had also converted a 16<sup>th</sup> century farmhouse in the countryside into a family museum, Chillida Leku (Chillida Space), that is scheduled to become public in time. On the way to our final four days of the tour to be spent in Madrid, we stopped in Vitoria, the political capital of the Basque territory, to visit the square designed by (again) Eduardo Chillida, a collection of Spanish contemporary art, a private collection, and the new Cultural Center of Montehermoso devoted to contemporary art. In Madrid, we checked into the marvelous old Ritz Hotel. What were the highlights of my first time in Madrid, the capital and heart of Spanish life and culture? The Reina Sofia Art Center, the Juan March Foundation, the Caixa Foundation, the Royal Monastery of San Lorenzo de el Escorial, the Thyssen Collection, galleries, private collections, and artists' studios: all these; however, away from the modern and contemporary, we found the Prado to offer the most profound artistic experience. The Prado remains the jewel! The return to Los Angeles via Paris and New York was psychologically abrupt while physically lengthy.

The agreeable summer pattern of Desbarats, Dunewood, Aspen, St. Malo was followed in October by an NPCA tour of Yosemite for the Board of Trustees and Special Guests. Any visit to Yosemite is memorable, but this—my first—was special because the National Parks Conservation Association was going to show us how they were planning new restoration and visitor implementation. We were on an inside track that also included stops at the Ansel Adams sighting spots (via an electric shuttle bus within the park):

South entrance and the Mariposa Grove of giant sequoia  
 Pioneer Heritage Center  
 Glacier Point  
 Wawona Hotel (1879)  
 Yosemite Valley—West and East  
 Cathedral Picnic Area  
 Half Dome  
 Yosemite Lodge  
 Ahwanee Hotel—dinner, lectures and overnight stay (luxurious)

I found a diffident rattlesnake in the garden.

The Art Institute of Chicago sponsored a Journey to History's Lost Cities by private jet, October 27-November 20, 1998, and Peggy and I were aboard the Boeing 757 converted to roomy first-class seating. T.C.

Schwarz, the owner of TCS Expeditions and the organizer of this one, was with us for a good part of the journey. Some benefits attended us throughout. Excellent luncheons were served as we flew between countries. These were prepared by a great chef and his helpers in airport facilities along the way and were served by an attentive crew. During the flying hours, there were comprehensive lectures transmitted on the Air 2000 screens by brilliant scholars and professionals. These talks supplemented the printed literature that we were given in advance, magically amended during the night to accommodate any change in schedule. Nightly presents appeared on our pillows. Spending money (*ca.* \$10) in a new country's currency also appeared. This usually went for postcards and souvenirs, with any residual being distributed to the grandchildren. At each location, we received expedited clearance at immigration and customs. Ground transportation was efficient; luggage handling, hotel room assignments, departures, etc., occurred seamlessly. We became spoiled for normal travel while we remained appreciative of all the amenities. When we were touring on land, we used audio receivers, which allowed us to hear the guide speaking into his transmitter, no matter what our relative positions or directions would be. We now think of this as the *only* way to organize a walking or museum tour. No member of the tour then has to miss anything that the guide is saying, and no jostling is necessary to take up a position near the guide. Our evening meals were "of the country" and were usually accompanied by entertainment—native dancing and singing. What about the postcards that we bought to send to grandchildren and friends? No problem. They were stamped and mailed by our guides. No wonder the grandchildren received so much mail!

These were the cities and countries that we saw, with our major observations and impressions.

**Petra, Jordan**—reached by a flight from London to Aqaba and motor coach from the Gulf into the mountains. The main attraction is the mysterious desert city that was founded by the Nabataeans some 2,000 years ago at the crossroads of caravan routes linking Egypt, Arabia, and Mesopotamia. The entrance is a slim crack in the huge sandstone cliffs. The narrow, twisting siq guarded the site for hundreds of years. It is best traversed by walking. Rainwater was brought in through the siq by a channel that had been chiseled into the cliff side flanking the passage. At its city end, one faces the Treasury Building (function assigned) that so often appears in travel pamphlets. There were other facades of buildings built into the cliffs, including burial vaults. An early Christian church was being

excavated and restored. The coach ride back to Aqaba followed the Desert Highway, with stops along the way to view the vast wilderness area.

**Muscat, Oman**—After the flight from Aqaba over miles and miles of desert, we finally saw irrigated landscape and the beauties of the capital of Oman. Following an excellent highway system, buses brought us from the Muscat Airport to the spectacular Al Bustan Palace Inter-Continental Hotel on the coast. We were welcomed into the 150-foot high lobby with swinging censers of frankincense. In this hotel surrounded by cliffs and the Arabian Sea, we had a large room with a balcony and an adjacent marble bath with more amenities than one could ever use. After a long night of rest and breakfast on the outside terrace, we were treated to a sightseeing tour of the clean, clean city with its buildings in white with blue trim. We saw many examples of modern Omani architecture, the Natural History Museum, the old Portuguese forts, the imposing royal palace of Sultan Qaboos, the Bait al Zubair Museum of traditional Omani objects and treasures, and the U.S. embassy (with lunch). I went for a swim in the Gulf of Oman. After all, when would I have another chance to claim that?

**Agra, India**—This stop in India provided us with a single day's opportunity of seeing the Taj Mahal, the world famous and everlasting tribute of Shah Jahan to his wife. We also had time to see a marble factory.

**Jodhpur, India**—Our residence was a palace, the Umaid Bhawan Palace, built in 1929 by the same British architect who designed Buckingham Palace; our room, a three-room suite. Rural Rajasthan offered us the opportunity of visiting villages of the Bishnoi people, who, as early as the 15<sup>th</sup> century, made protection of nature a "religion," and of seeing (and purchasing) local handcrafts: rugs, pottery, saris. Dinner was served on the parapet of the 16<sup>th</sup> century Meherangarh Fort. Turbans were provided for the men, long silk scarves for the women. The beauty of the scene on the parapet—the warm night under a full moon—was enhanced by native dancing and music.

**Vientiane, Laos**—In a land of agriculture and Buddhism, we enjoyed most seeing the famous stupas, including Wat Pha That Luang, Wat Si Saket, and Wat Pha Keo. We also saw the Patuxai, or Victory Monument, that commemorates the 1953 victory over the French.

**Luang Prabang, Laos**—A charter flight on Lao Aviation took us to Luang Prabang, a World Heritage site, for a tour of wats, including Wat Xiengtong,

and the former Royal Palace. Along the way we saw Kuang Si Falls. A visit to Ban Sang Haei, a village on the Mekong River (used for all functions) where rice wine is the traditional product, provided the greatest contrast to life as we know it. The villagers' needs and wants were remarkably few or, at least, seemed to be. A trip up the Mekong River in long river boats brought us to the mouth of the Ou River to view the Pak Ou Caves filled with thousands of Buddhist statues. It was truly a different world. I felt that we were intruding on religious history, but appreciatively.

**Siem Reap, Cambodia**—After flying from Vientiane to Phenom Penh, we boarded Royal Air Cambodia for the short flight to Siem Reap and were lodged in the Grand Hotel d'Angkor, another *really* grand hotel. Our room was adjacent to the swimming pool. Peggy swam this time while I napped. We had dinner with Ed Horner of the Chicago Art Institute and John Sanday of Cornwall, U.K., Kathmandu, and Siam Reap. John works for the World Monuments Fund and is guiding the preservation and restoration of Angkor. He had a great store of experiences and anecdotes, which he shared with us as we toured Angkor Thom, with its huge temple, the Bayon. An extra little guide, Huit, age 8, attached herself to me and, tiny hand in mine, guided my footsteps over tree roots and up and down stone steps. Her fee, "One dollar, please," was smilingly and happily paid. [We were wisely told to bring along some crisp U.S. one dollar bills.] We followed our assigned guide, Sam, to other temples, but by noon we were in need of a cold shower, refreshments, and a rest or massage.

Back on the minibus at 3:15 p.m., we toured Angkor Wat, the largest—and most photographed—of all the ruins. Huit appeared on cue to look after us again. Her mother had brought her on a bicycle so that the family could benefit from the tourists' usual schedule and the resulting distribution of a few dollars. Huit appeared at every turn, to laugh, smile, fan us, and "assist" me in climbing and descending. We were amused at the wit of the children and their delight in each other, along with their canny ability to show up wherever tourists appeared. Children now constitute 47% of the population of Cambodia. The adult population was decimated by a series of events: U.S. bombing during the Vietnam War, slaughter by the Khmer Rouge, and violent losses with every regime change. John Sanday was on hand to show us how the Cambodians were learning to do the reconstruction work on Angkor Wat. For us, the evening was as rewarding as the day had been: a long, leisurely swim in the pool; cocktails and torchlit buffet dinner by the pool; and a performance of classical Cambodian dancing—with gorgeous costumes.

**Kathmandu, Nepal**—It was then back to Phnom Penh for the reboarding of our own *Explorer I*. The flight to Kathmandu brought us through brilliant blue sky and gorgeous clouds and into a huge, crowded modern airport. We were whisked through immigration and customs, taken on an introductory drive through Kathmandu, and then bused to our hotel, the Soaltee Crown Plaza, where we were greeted with trumpets and cymbals, marigold leis, and the red-dotting of our foreheads. We did some exploring on our own. Peggy, who had started out from Kathmandu on some vigorous treks in years past, did not recognize much in the contemporary city. We had dinner with Kent and Barbara Manning of Michigan, who became good friends during this trip. We were up early to wander the grounds of this old pagoda-style hotel and then to visit the nearby town of Bhadgaon, replete with temples, prayer wheels, and many children.

**Tiger Tops, Nepal**—From the Kathmandu Airport, we flew to the Meghauli Airport at the edge of the Royal Chitwan National Park for transfer by jeep, small boat, and jeep again to Tiger Tops—and its Jungle Lodge, with all rooms one story above the ground. After watching elephants bathing and being scrubbed in the river, we were loaded on the elephants' backs in howdahs, along with the mahout, for a walk through the jungle. The sightings included languorously bathing rhinos, a one-horned mother rhino leading her baby through the tall grass very close to us, monkeys, an antelope, and a variety of birds. A local, very knowledgeable guide led us on a morning jungle walk, identifying the flora and fauna and the birds, including the meanings of their calls, and showing us the tracks of a tiger that had dragged off some bait that had been left for him. No sighting, just the evidence of a satisfied departure. Lumbini air charters returned us to Kathmandu, flying low over the hills so that we could enjoy the incredibly intricate terracing for the growing of rice.

**Lhasa, Tibet**—After a combined three-night stay in Kathmandu and Tiger Tops, we were ready for the China Southwest Airline flight over the Himalayas to Tibet. We were then loaded into minivans for the drive to the city of Lhasa across the high Tibetan plateau. Stops along the highway provided the opportunity for photo shots: Tibetan women with children, yaks, mountains, and the pass over which the Dalai Lama had escaped on horseback with his followers to India, where he was welcomed and has since lived. We were welcomed at the Lhasa Hotel with traditional white scarves, a ceremonial water-and-seed ritual, dancers in yak costumes, and drumming. Then we rested in order for our bodies to adjust to the altitude (*ca.* 11,000 ft.) It took Peggy longer than me to feel up to intense sightseeing, but both of us adjusted.



NJL and Peggy, Tibet, 1998

How is it to see the famous Potala Palace, the former home of the Dalai Lama, in reality? Pictures of it are abundant, but to take in its massive proportions from close by is breathtaking. After a climbing walk of about 100 yards, we entered the rear of the palace and were guided through the hallways, rooms, food preparation area, and temples at different levels. Thousands of yak-butter candles illuminated the hallways and rooms; after the lengthy tour, we smelled like yak butter—at least our hair and clothing did. Most of the monasteries of Tibet were destroyed when the Republic of China officially annexed Tibet, but representative ones still exist. We visited the Sera and Drepung Monasteries, a most revered religious

structure: the Jokang or Tsuglaghang, the New Summer Palace or Norbulingka, the Barkhor Market, and a Tibetan carpet factory.

We had Cantonese dim sum lunches and a wonderful Chinese dinner followed by a Tibetan folklore show in which I was embraced by a yeti, a mythical white, hairy creature. Since the Chinese moved into Tibet, many yaks have been slaughtered for food. One reflects on the two cultures (1) the Tibetan, which depends upon the yak and will be forever changed if the animal disappears, and (2) the Native American, which—in the West, at least—depended upon the buffalo and was lost. A particular visit that thrilled me during our days in Lhasa was the one we paid to the Tibetan Medical Center. We saw some of the original pages of a pharmacological compilation dating back to the 7<sup>th</sup> century A.D. describing the herbal remedies for some of the chronic diseases, along with a large collection of herbs. A video of medicine as practiced today in Tibet indicated that, while people turned to herbal medicine for chronic ailments, they turned to Western medicine for acute ills. The drive back to the airport for Lhasa before dawn and as the rising sun lit up the high plateau was a “pinch me, I’m really here” experience. A chartered China Southwest airlines returned us to Kathmandu, where we boarded our *Explorer I* for the rather long flight to Beijing.

**Beijing, China**—One of our efficient hostesses came to my seat on the 757 to take me up to the cockpit, acting on a surprise gift request of Peggy for our wedding anniversary. As we flew a route parallel to Everest and the whole chain of the Himalayas, closely visible in the clear blue sky, I had another “pinch me” experience. The pilot, co-pilot, and first officer were so busy reaching over me to take photographs that no one was actually flying the plane. It was on auto pilot. The Palace Hotel was our impressive home in Beijing. The city had become a bustling, well-lighted metropolis in the approximately 15 years since I had last seen it. Still a dusty city, construction was going on at a rapid pace. There were many more automobiles, and the Chinese women were dressed more colorfully. We had quality time to talk with Henry Chu, the *LA Times* correspondent in the Republic of China, who was enlightening on any phase of the vast country that was his territory. Our tours took us to the less touristy section of the Great Wall on which we could walk for some length. We borrowed (were given) a cell phone from three Englishmen on a business trip to call Marcia and wish her Happy Birthday from the Wall in the middle of her night. We also had an escorted tour of the Imperial Palace and Forbidden City while in Beijing, and Peggy and Barbara Manning toured Silk Alley (one mile of stalls) for impressive purchases, including a duffle bag to carry them all.

**Xian, China**—The intended trip to Ulan Bator was canceled due to heavy snows in Mongolia. TCS arranged for a day’s outing for Barbara and Kent Manning, Margery and Harold Margoles, and Peggy and me. The buried terra cotta army had increased in size (since I had seen it) by continuing excavation, and a new section had been prepared that seemed to be the high command unit. The huge surrounding plain is thought to contain more warriors, chariots in numbers (thousands), sufficient to protect the Emperor Qin in his afterlife. Our favorite tour also included the city itself, a museum, and a walk in the old city wall. We felt very special when we returned to Beijing.

**Samarkand, Uzbekistan**—On our way back to London, our last stop was Samarkand. When I was in Uzbekistan in 1975 with a biochemistry team from the USA, we were denied a stop in Samarkand although we did visit Tashkent and Bukhara. On the ancient Silk Route, this famed capital of Tamarlane in the 15<sup>th</sup> century, is home to the Bibi Khanym Mosque (collapsed, with a legend), Ulugbeg’s ancient observatory of the sun and planets, the Shash-i-Zinoba complex of madrasahs and mausoleums (13<sup>th</sup> century), the Afrosiab Museum, the mausoleum cave with the remains of

Tamarlane, Registan square, the Museum of History and Arts of Uzbekistan, and the market place.

**London, England**—On the 7+ hours' flight from Samarkand, we were treated to a wrap-up discussion by our lecture team as we reviewed the experiences of our fulfilling journey.

## 1998-1999

A "Voyage Through the Sea of Cortez" aboard the M.V. SEA LION was our treat for the New Year. It was considered an expedition (Lindblad/Betchert) and was sponsored by the American Association for the Advancement of Science and Sigma Xi, two science organizations of which I have been a member for many years. I had never been south of the border, so that everything I saw in Baha California and in the Gulf of California was a surprise. Peggy had been fishing off Cabo San Lucas in an earlier year. After flying into Cabo San Lucas from Burbank via Phoenix, we were welcomed aboard the SEA LION (152 ft., 95 tons) by Captain Pat Nimburg, the officers, crews, and the natural history guides and lecturers for a tour around the cape, with its spectacular rock formations and wildlife, and to enjoy the sunset. Via SEA LION, we toured up (and down) the eastern coast of Baha: The Gorda Banks, and the islands: Los Islottes, San Francisco, Espiritu Santo, Santa Catalina, San Jose, Partida, and del Carmen. The sailing schedule was flexible enough for us to follow gray and pilot whales, bottle-nose and common dolphins, and sea lions. In the clear water of inlets, we saw sergeant majors and cornet fish in great numbers. We did not try to fill in our given bird-watchers charts, but we saw, on land or in the air, blue-footed boobies, yellow-legged gulls, ibis, egrets, Peregrine falcons, cormorants, pelicans, osprey, frigate birds. At least, these were the birds we could identify easily and liked the most. On land, we learned to identify the many varieties of cactus, and we found tarantulas and large grasshoppers. Inspection of the tide pools revealed starfish, urchins, worms, hermit crabs, and—near the shore—Sally Lightfoot crabs, poised daintily to inspect us and all possible sources of food. Zodiacs were aboard to take us to inlets, beaches, and hiking trails on selected islands. The most exciting cruise was through the very shallow mangrove channels on Isla San Jose, where we could also see the ancient shell mounds or middens that reveal traces of the Perique Indians. The most entertaining evening was New Year's Eve, when, together with "explorers" from our sister ship, the MV SEA BIRD, we celebrated with a beach barbecue

feast, fireworks, flares, and cheers. Timing did not matter; we were celebrating the arrival of 1999 somewhere in the world. At the end of the voyage, we flew back from La Paz via Phoenix to Burbank.

## 1999

We joined a trip of the Fellows of Contemporary Art to Rome and Tuscany May 28 to June 8, but arrived two days early in order to combat jet lag and to sample classical Rome a bit for our own orientation. I had never been there before; somehow, the Anglo-Saxon spirit had never been ready for the ultimate Latin/Italian experience. This time, the spirit was ready. The most convenient and comfortable route for us was via Frankfurt on Lufthansa flights. The selected Crowne Plaza Minerva Hotel, a converted 17<sup>th</sup> century palace, was also convenient, right in the heart of Rome and within easy walking distance of innumerable historic sights. Some of the one-way streets are so narrow that a pedestrian must be alert to crowd against a building and to duck so as not to be clobbered by a passing bus with its protruding mirrors. The Pantheon which was close by became a favorite stop on our walks, as did the towers, fountains, squares, and churches nearby. We learned which structures or ruins were to be found on which of four of the seven hills of Rome and that the Roman Forum was located between Colle Capitolino and Colle Palatino; the Circus Maximus, between Colle Palatino and Colle Aventinol. With the Fellows, we had special tours of the Colosseum and of Vatican City: St. Peter's Basilica, including the Vatican Grottoes and St. Peter's tomb, Castle of the Holy Angel, the Vatican Gardens, St. Peter's Square, the Musci Vaticani, and the Sistine Chapel, newly restored.

Special treats were the inside looks at the American Academy in Rome and the French Academy at the Villa Medici. Great restorations could be appreciated in the Palazzo Altemps, Galleria Borghese, Palazzo Massimo, and Palazzo Doria Pamphili. Contemporary art and sculpture were viewed in many galleries and artists' studios, converted industrial space, and private collections. We visited spectacular sites in Umbria and Tuscany, including Niki de St. Phalle's "Giardino dei Tarocchi," her crowning work; the sculpture garden of Daniel Spoerri, the Swiss artist and former U. of Penn professor; Todi, in Umbria and the Todi residence of Al Held, the American painter; and, most notably, the Fattoria di Celle, the private sculpture collection of Giuliano Gori on his large estate located outside Pistola. Our final night, including a farewell dinner, was spent in La Posta Vecchia by the sea in Ladipoli. It was formerly J. Paul Getty's villa. The

story of Rome and Tuscany is not complete, however, until I tell you that we met friends of Peggy's for dinner in Rome: Deborah and D. Paul Thomas (he is an actor and playwright), Hope and Eddie Connors (he is a teacher and tour guide), Sheila Taylor and Ilaria Antinori (first and second cousins).

*My* friends were in Japan, where I went without Peggy later in June of 1999 to help Michinori Oki celebrate his retirement from Okayama University. He and his wife Fusae met me on arrival at Narita Airport to take me to the Hilltop Hotel on Surugadai, one of Tokyo's highest hills, for a brief rest, then dinner. The party was arranged for the following evening. I had been invited to attend by one of Michi's former students, Mikio Nakamura, Professor of Chemistry at Tohu University School of medicine, whom I had met some 10 years before, but it was not obvious that I would be not only an honored guest but a possible speaker at the celebration. Nevertheless, I considered that this might happen, so I had a talk prepared—about 1½ pages in large type that I could read easily if necessary, in which I traced our interactions during 50 years: in chemistry, publishing, travel, skiing, teaching, and international chemical organizations. It was easy to congratulate him because he has been such a fine internationally-appreciated role model.

I convinced Michi and Fusae that we should inspect the new Tokyo Cultural Center (Opera City), which they had not yet seen. Designed by the architect Yana Gisawa, it is a marvelous collection of buildings, including an opera house, an orchestra hall, and theaters for drama and experimental presentations. A tall building within the huge complex houses offices, practice rooms, and conservatory classrooms. We listened to a new opera, "Crime and Punishment" (Dostoevsky) by Kazuko Hara, and determined that she is a fine composer and that the acoustics of the hall were perfect, really spectacular. Still on a culture binge, Michi and Fusae showed me through the Tokyo National Museum complex on the following, my last, day. In all, I have made five visits to Japan. I have been on all of the major islands, and, at one time, there were professors on all the islands who had worked with me at the University of Illinois.

In the first week of November, Peggy and I joined the Fellows of Contemporary Art again for a tour of Pittsburgh, which has had a renaissance as an art center. The central attraction was the 1999 Carnegie International Exhibition of Contemporary Art. First, there was a gala opening reception at the Carnegie Music Hall and, two days later, the official opening, to which we were allowed early entry. The theme was conceptually-oriented realism, to which 40 artists from around the world had contributed screen videos to installations to wall paintings, giving us the opportunity of

discovering and revisiting favorites. The Mattress Factory (It *was* a defunct mattress factory) also provides invited international artists the opportunity to live and work in Pittsburgh long enough to create specific installation pieces. Those we saw in November were a combination of unusual and amusing. The most gratifying thing we saw on our tour was Fallingwater, Frank Lloyd Wright's impressive house built for the Kaufmann family and situated over a waterfall. The house and grounds have been entrusted to the Western Pennsylvania Conservancy, the only major Wright work to come into the public domain with its setting, original furnishings, and artwork intact. Another Wright house, Kentuck Knob, which is owned by Peter Palumbo of the U.K., a collector of modern domestic architecture, was especially attractive for me to see because it is based on a hexagonal modular grid and is nestled (north side) into the brow of a hill. The home of Damian and Terri Soffer, across the Allegheny River in Fox Chapel, was designed by a Spanish architect and is a contemporary masterpiece. On the crest of a hill, it features walls of glass and smooth reflecting pools, with imaginative use of smooth concrete surfaces. By contrast, Henry Clay Frick's Mansion, "Clayton" on "Millionaire's Row" in Pittsburgh, locked with all its content in 1915 and only opened to the public in 1990, is an example of Queen Anne style architecture. The adjacent Car and Carriage Museum had marvelous examples of the best in old American private transport. One would have to be in New York City to see, in the Frick Collection, the results of the Frick's accumulation of French impressionists.

The Carnegie Museum in Pittsburgh features rotating exhibitions: the Carnegie's Heinz Center for Architecture was showing "The Pritzker Architecture Prize 1979-1999" sponsored by the Chicago Art Institute; and the Andy Warhol Museum, seven stories tall, was packed with his drawings, prints, paintings, sculptures, film, audio and video tape, plus archives relating to the Pittsburgh-born prolific artist. Private collections, galleries, and artist studios were also open, as customary, to the Fellows on this trip.

## 2000

Peggy and I celebrated the New Year in London. Our direct flight from Los Angeles departed in the early evening of Christmas Day and arrived at Heathrow in the early afternoon of Boxing Day, an obvious rest day because of the national holiday. From our London abode, the Basil Street Hotel, we explored favorite haunts, visited museums, listened to

music, attended theater productions, ate at recommended restaurants, and walked and walked. The Museum of the History of London and the round Library of the British Museum offered special treats. St. Paul's Cathedral service generated awe, while window shopping provided holiday cheer. Michael Parsons drove us to Oxfordshire to visit Rodney and family for a Christmas-style feast. Taxis and tubes in London still provide the finest service.

Later in January, actually January 20 to February 8, we joined a second TCS Expedition, this one to South America. It was organized in the same way and was as special as our first Expedition across Asia. We added eight new countries to our travel roster, plus fabulous sights and experiences that remain vivid in our memories. It all started in Miami, where we stayed two nights with Mason Phelps, Jr., in order to prepare ourselves for the rigorous expedition. In all, *Explorer I* would fly 38.5 hours and travel 15,140 nautical miles (17,410 statute miles). At the Miami Airport Hilton, where we met for a reception and dinner, there were introductions and short talks about what we might expect en route. The first stop was Manaus, Amazonas, in Brazil.

## Ariau Amazon Towers Hotel

From the Manaus Airport, we transferred directly to the Tropical Hotel Pier to board boats for a trip up the Amazon and Rio Negro Rivers to the site of the jungle hotel which consisted of a series of towers overlooking the rainforest canopy and all connected by boardwalks high in the air. We were in the realm of monkeys and parrots, a new "camping" experience. We were also treated, after a canoe trip, to a jungle trek and instruction in basic jungle survival, including illustration of which plants can be eaten and which are poisonous, and how to use palm fronds for thatching shelter. We also indulged in guide-assisted piranha fishing in the Rio Negro, using pieces of meat as bait. One of the more courageous members of the group was swimming (very slowly and smoothly) on one side of the canoe while we fished on the other side. Brazilian dancers entertained in the evening. Eventually, everyone joined in. A boat ride returned us to Manaus and a bus transfer, to the neoclassical opera house where we heard a recital of chamber music of Vivaldi and Brazilian composers. During the late 19<sup>th</sup> century boom in rubber latex extraction and rubber production, Manaus was a prosperous city. The port is still the collecting point for everything that the vast Amazon area produces.

## **Iguazú Falls, Brazil**

This site is the collecting point for all the water in the Rio Iguazú, where it widens to two miles just before it falls almost 200 feet. Walking tours with local guides and biologists on both the Brazilian side and the Argentinian side, together with a helicopter ride above the Brazilian territory, allowed us to absorb the size and beauty of the largest falls in the world, all surrounded by rain forest. On one of the walks, I watched a large snake in the act of stealing eggs while the nesting birds attempted noisy but futile protection. Who says one cannot choose sides when watching one of life's phenomena? Another walk through a bird sanctuary reassured me that there were birds in sufficient number and variety to keep Brazil and its flyways well populated.

## **Port Stanley, Falkland Islands**

We flew over water to these islands whose ownership had been hotly contested by the Argentinians (1982) but successfully defended by the British. Our Malvina House Hotel was very comfy (Peggy's description). We walked to the Anglican Cathedral and went to tea at the home of the Governor General, feeling very Empirish. Tours on Stanley also included visits to a museum, war memorials, cemeteries, battlefields, Gypsy Point to see the Magellanic penguins, and a sheep station for a sheep-shearing demonstration and lunch (not lamb). In many sections of the island, it is imperative to stay on the walking paths because of indiscriminate landmine laying by the Argentinian Army during the Falklands War. Some of our fellow travelers flew in small planes to Port Howard, Pebble Island, or Sea Lion Island, but we missed the draw. We left with major remembrance of the ubiquitous yellow gorse and the strong, unceasing wind.

## **Puerto Natales, Chile**

From our landing at the Punta Arenas Airport, we took a charter flight to Puerto Natales. A large crowd greeted our arrival. The reason did not reside in our persons. The aircraft, a Boeing 737, was simply the largest one that had ever landed at this gateway to the Torres del Paine National Park of Chile. I suppose the people had gathered to find out whether the

runway was long enough! It was. There was much to see, and the Park beckons us to return. Excavation of the Cueva del Milodon began in the late 19<sup>th</sup> century and has revealed three distinctive layers. The uppermost shows remains of human settlement; the middle, bones of an extinct American horse; the bottom, bones of the milodon, a giant ground sloth that lived approximately 10,000 years ago. The mountains are spectacular—in color, height, volcanic origin, cragginess, snow and glaciers, lakes and forests. We saw guanaco, rheas, and Andean deer. One of our walks took us to the Salto Grande waterfall. Another excursion gave us a chance to see a cattle ranch where they also had llamas and alpacas and where we were treated to horseback riding, a lamb barbecue, and music.

## Bariloche, Argentina

After the charter flight to Puente Arenas and the *Explorer I* flight to Bariloche, we were lodged in the luxurious Llao Llao Hotel and Resort, with a view over Lake Nahuel Huapi and set in the huge National Park. Aboard the *Modesta Victoria*, we toured the lake and enjoyed nature walks on the Quettrihue Peninsula (arrayanes trees) and Isla Victoria (red deer running free). By about this time on the trip, we had sorted out the majority of our fellow passengers and had found particular friends in Ted and Iva Hockstim of Dallas, Texas, Dr. Kurt Mach and his opera-singer wife, Olive Moorefield, from Vienna, Austria, and Ann Taylor of Bethlehem, Pennsylvania. A trip to San Carlos de Bariloche on the southern shore of Lake Nahuel Huapi, an Austrian-style village, included time to stroll around the village and to ride a cable car up Cerro Campanario. The magnificent 360°-view from the top of the hill included the lake district, snow-covered peaks, glaciers, cascading rivers, forests, and bare mountains, all in brilliant sun. The *National Geographic* describes it as one of the eight best views in the world.

## Easter Island, Chile

Rapa Nui was the furthest island reached by the Polynesians in their migration southeastward. It took us more than 5 hours to fly there from Bariloche, and there is no firm indication that the early Easter Islanders ever traveled the great distance to the South American continent. We listened to lectures about attempts to unravel the secrets of the Easter

Islanders and their demise, and we marveled at the giant statues (moai) that had been sculpted out of lava and dragged or rolled about the island. Part of the fascination of Easter Island is certainly imagining what was going on with the statues and the cults when the resources of the island could no longer maintain the population. Accommodations on the island have improved with a new addition to Hanga Roa Hotel.

## San Cristobal, Galápagos

Island-hopping in the Pacific off South America takes time because of the distances, in this case from Easter Island to the Galápagos (4½ hours flight time to Puerto Baquerizo Moreno, the capital). After clearing Ecuadorian customs and immigration, we boarded *MV Explorer II*, which was to be our comfortable home for three days. One can never be satisfied with one visit to the Galápagos Islands! The experience of sharing space in the water and on land with other creatures, who are in their natural habitat, is a treasure. One is not supposed to communicate with those other “creatures”; the guides make that clear from the start of any walk or swim. What, then, was memorable for us, for me? Gardner Bay on Española—I was swimming off the beach in deep water. I saw a rock, or what appeared to be a rock; I put a foot down to see if I could reach it. The “rock” moved, and the very large sea lion swam alongside me as I swam toward the beach. I think he was a “lifeguard” sea lion because he swam away when he saw that I had reached shallow water safely. I was thrilled. On the beach, someone had left a towel laid out while that person had gone into the water. A baby sea lion had appropriated it and was basking in the sun just as a small child might do. On the cliffs above Punta Suarez, we encountered colonies of sea birds: albatross, blue-footed boobies, and masked boobies among them. One hitchhiking blue-footed booby landed on the hat of one of the men in the group and had a free lift. We had to watch where we stepped as we walked in order to avoid the marine iguanas and lava lizards. Floreana Island—The palo santo trees and the flamingos were most interesting. We watched for the famed Darwin finches wherever we were. Santa Cruz Island—We received some education at the Galápagos National Park Headquarters and the Charles Darwin Research Station and then crossed the island to see the Giant Tortoise Reserve in the highlands. The huge tortoises move very steadily! They were not interested in us—only in other tortoises. They had very wise-looking faces and, although old, were still interested in mating.

## Cuzco and Machue Picchu, Peru

After our return to San Cristobal, *Explorer I* flew us to Lima, Peru, where we transferred to the domestic terminal for a short flight over the Andes to Cuzco on a Lan Peru jet. We were given lunch and some time to rest in the Hotel Libertador (altitude 11,000 feet). Those of us who were reasonably acclimated to the altitude explored the city with very knowledgeable guides. Everything in the 17<sup>th</sup> century was built over the original Inca structures. The trip to Cuzco was actually a 3½-hour narrow-gauge-railway journey. The train first climbs out of Cuzco by a series of four back-and-forth zigzags. There is not even space for a turn as it climbs the mountain face. After traversing the Urumbamba Valley, the train arrives in Aguas Calientes, where one shifts to a motorcoach for a dramatic ride to one of the most dramatic sites in the world. Peggy had been to Machu Picchu earlier in her travels, but she had trekked there via the sheer mountainside Machu Picchu trail, some accomplishment! In rain with final clearing on February 6 of 2000, we climbed the stairways, explored the House of the Sun, watchtower, temples, houses, baths, and the aqueduct that brought water from mountain springs. We marveled at the Inca stone construction. Travel back to Cuzco was by bus across the high, fertile plateaus, over two 13,000-foot passes, with stops at two very special Inca sites: Ollantaytambo and Saesayhuaman (pronounced “sexy woman” but meaning “satisfied falcon”). The farewell dinner of the tour was a buffet in the archeological museum, Museo Inka, in Cuzco, where we had the opportunity of visiting some of the rooms before dinner. The short flight to Lima and a change to our private jet for the 5-hour flight back to Miami completed our South American expedition. On the final flight, I asked for the microphone after the final wrap-up lecture by the pros so that I could thank the organizers and staff for the new life experiences they had provided and for making us better South Americans. I had not told Peggy what I was going to do; I believe she was a bit nervous when I strode to the mike. I flew back home, but Peggy lingered in Wellington, Florida, to attend “Denim and Diamonds,” the magnificent fund-raising party that Mason put on for the benefit of the U.S. Equestrian Team.

One is never tired of London. The city is comfortably the same, yet it accommodates changes, absorbs them, and declares them part of the venerable, pleasing fabric. Peggy and I were pleased to join the Fellows of Contemporary Art Tour of **London and Basel**, June 15-23, 2000. We saw both old and new. Visits to the Serpentine Gallery and the Saatchi

Gallery were balanced with a trip to Sculpture at Goodwood, an outdoor sculpture garden with wooded walks and grassy areas that exhibits British sculptors. It is an effective, altruistic, long-term project. We were guided by the owners and by some of the artists themselves. We were also welcomed in London's well-known galleries and artists' studios, and we saw "Give and Take," a collection of art works that were to be given to various museums by Britain's Contemporary Art Society. We visited the Tate Britain, which now is considered to be exhibition space for British art from 1500 to the present, and we were overwhelmed by the new Tate Modern, converted from the old power plant. Turbine Hall itself, at 500 feet long and 115 feet tall, can house contemporary installations of all sizes and complexity. In addition, there are seven floors devoted to exhibit galleries, an education center, bookstores, restaurant, and small rest-and-reflection centers. From the excellent restaurant on the top floor, there are magnificent views of St. Paul's Cathedral and the new Millennium Bridge (only recently reconstructed so that it does not swing). Other new and worthy restaurants, appropriately tested, include The Pharmacy, launched by three artists, and Asia de Cuba, where a Chinese meal was the favorite. At night, there were new plays to see: "Copenhagen" and "The Lady in the Van," with Maggie Smith.

We visited the famous Basel Art Fair, by bus and train, from our hotel in Zürich, the St. Gotthard. The 250 galleries at the Fair were sufficient to occupy our senses while we returned again and again to favorites. In Basel, we toured the Foundation Beyeler, in a building that had been constructed since the Fellows' earlier visit to Basel. The Foundation, established for the purpose of advancing and displaying the arts, was showing installations based on the theme "From Dark to Light." The Beyeler Gallery in Old Basel was showing works from Dr. Beyeler's own collection, some of which we had been privileged to view in his private storage facility in 1992. Lunch in the Kunsthalle Restaurant, adjacent to the huge, mechanical Tinguely fountain, was followed by a walk through the Basel Kunstmuseum's exhibit of Cy Twombly sculptures, where they were exhibited for the first time. In the Kunsthau Zürich, Clarisse Gagnebin arranged for an early opening so that we could see the Cézanne exhibition entitled "Finished/Unfinished" and addressing the issue of *when* a work of art is really finished. In the Vitra Design Museum at Weil am Rhein in Germany, we toured the diverse buildings that make up the Vitra Campus, a functioning architectural and design center. The concluding visit of our tour was to the Tinguely Museum, designed by the Swiss architect Mario Botta and containing 100 drawings and 50 sculptures donated by Tinguely's longtime companion Niki de St. Phalle. The

motorized sculptures, “mad” machines, and more fountains added the final joyful notes to the tour.

## 2001

Where should we have a celebration of a grandfather’s 85<sup>th</sup> birthday? That is, to what place could Opa attract his children and grandchildren so that they would want to celebrate his birthday in 2001? After Peggy and I had talked with friends who had enjoyed touring the Inside Passage of Alaska by boat and we had done research on transportation available, we checked with my four families to learn when they would have one week free or, more specifically, whether the week of July 2-9 would be a possibility for an Alaska tour.



NJL with the four children, Alaska, 2001

We had learned of a Smithsonian Study Tour aboard the *M/V Wilderness Adventurer* out of Juneau that would accept our family of 17 for that period. All said “OK” enthusiastically. Good! Now, how to pay for the adventure? Good luck! Some Oracle stock that I had bought earlier had appreciated sufficiently that, if sold before its value slid down again, would

pay for the week. Sold! The families would have to take themselves to Juneau, Alaska. The remaining cost could be met by Opa. We all stayed one night at the Baranof Hotel, saw the sights of Juneau, and then boarded the Alaskan-native-owned *Wilderness Adventurer* to find our eight staterooms. We journeyed out of Juneau through Gastineau Channel and past the northern tip of Admiralty Island, on to Point Adolphus and Icy Strait, Glacier Bay, Chichagof and Baranof Islands, Admiralty Island, Tracy Arm Fjord, disembarking at Juneau and heading to homes in all directions. It rained on and off six of the seven days, but I heard no complaints. We dressed for it, and it did not interfere with any of the activities.

What were the most memorable events of the week according to the birthday person?

The waterfalls cascading down 1000-2000 feet  
The eagles soaring, screaming, or diving for fish  
The glaciers calving  
The brown bear foraging in the tidal pools  
The dolphins, orcas, and sea lions  
The harbor seals riding on ice floes  
Coming upon a huge moose on a woodland nature walk  
Seeing family members exploring in ocean kayaks  
Seeing family members enjoying meals together in all  
configurations or with fellow passengers  
Seeing the younger grandchildren involved in various group  
activities on board  
Appreciating the birthday party and the memory book put  
together by the grandchildren and children  
Seeing smiles and wonderment in young faces.

But, now, let us read what the grandchildren appreciated. I can give you a representative sample, the following short article written by young James R. Leonard.

### A “Cool” Gift

To a family of seventeen, a gift was given—a journey to “the Last Frontier.” Throughout the year before my grandfather’s eighty-fifth birthday, my father and his three siblings had been conjuring ideas about what to give him as a special gift. “How about this? How about that?” they would debate. Instead, he gave us a gift. My grandfather took us on a seventy-passenger Smithsonian cruise through 600 miles of Alaska’s Inside Passage. We kayaked through iceberg-filled waters and hiked in the rain forests. The trip represented many of his values: education, family, science, and nature. My grandfather told us, “I want to give the gift with a warm hand.” He wanted to see the satisfaction of the gift being received and enjoyed, rather than leave money in his will.

After a family gathering in the capital city, Juneau, we boarded our boat, the “Wilderness Adventurer.” Being reunited with cousins, aunts,



Grandchildren: James, Valerie, Michael, Jack, Julianna, Corinne, Zena

uncles, and grandparents was very remarkable since we live in different cities and see each other only two weeks a year. Therefore, every laugh, hug and kiss was a gift in itself. The trip was also a gift of adventure—an excursion to a natural “zoo.” We saw creatures in three habitats: birds, such as puffins and eagles in the sky; orcas, humpback whales, and sea lions in the water; and bear and moose on land. Our guides, a native Tlingit culturist, a geologist, a naturalist, and an Olympic kayaker on board answered every question we had. Our ship was extremely cozy. It was about one third the size of a commercial cruise liner and had a kayak launch deck at the stern. Its small size enabled us to travel through narrow straights, between icebergs, and near pristine hiking areas. The ship had no entertainment centers, no video games, and no pool. Thankfully, none of those common cruise ship distractions got between us and Alaska’s natural beauty.

Before the trip, Alaska was no more than a few “Eyewitness” videos and some pamphlets. Neither videos nor pamphlets could capture Alaska’s vastness and wonder. The voyage gave me a totally new perspective on life and the United States. I no longer think of the United States as the forty-eight contiguous states. I am now aware of our largest state; home of the highest mountain in North America, home to only one human to every square mile, and home to the most wildlife of any state. The knowledge I carry with me now of the wildlife, culture, and people of Alaska has made me a more interesting and appreciative person. I pray that Alaska will be preserved and protected. While we were on land I noticed that there were no billboards, no mini malls, no Starbucks, and no WalMarts. I hope that Alaska remains that way. Industrialization and commercialization of such a sacred place could ruin the native culture, pollute the surroundings, and destroy the habitat of animal species. I truly hope that what has happened to the world’s tropical rain forests does not happen to Alaska. I feel that I have also given a gift to Alaska. By educating myself about its resources, I potentially protect it in years to come. If politicians or major companies start destroying this sanctuary, I will speak out against it.

By the end of the trip, I came to the conclusion that adventures are the best and most appreciated gifts. I feel that I grew over the course of the trip. I formed a new bond with my family members and created recollections of the good times spent together. Some of my new experiences on the trip could not have occurred anywhere else. Very few people are able to experience things such as seeing whales in a place other than Sea World or kayaking among natural blue ice sculptures. The memories created in the trip were timeless. Now, when I have trouble falling asleep or am feeling restless, thoughts of Alaska calm my mind and bring back the great experience. They are gifts that won’t break or wear

out. I can't grow out of them. I can't lose them. These memories will stay with me for a lifetime. A famous quote in Simon & Garfunkle's "Bookends Theme" represents the memories made in Alaska. "Time it was. And what a time it was. It was. [ . . . ] Preserve your memories. 'They're all that's left you.'" Thanks to Alaska I also look at the world differently. All in all, I feel that my voyage to Alaska was given with not just a warm hand, but also with a warm heart. It has been the most memorable and meaningful gift that I have ever received.

## 2002

At the end of May, we were once again on tour with the Fellows of Contemporary Art, this time to **Sweden** and **Denmark**. We continued on our own to **Norway** and **the Netherlands**. Peggy and I flew to London and on to Stockholm, where we stayed in the Nordic Light Hotel. This very modern hotel can be recommended for its comfort, convenient location, and interesting design. Artistic decoration in the private and public rooms is accomplished by means of light—reflections and shadows. The geography and architecture of Stockholm are still notable, no matter how many times one visits the city. Our guided tour also took us to art locations; e.g., works from the permanent collection of the Moderna Museet lodged temporarily downtown; *Index*—an independent art space, offices and galleries of young designers, the Bonnier Collection on Djurgården Island, and Tënsta Kunsthalle in one of the suburbs. An early afternoon flight to Malmö, Sweden, gave us time to go to the Roseum Centre for Contemporary Art and to have studio visits with outstanding young artists. As a special treat, we were welcomed in the home of Lars Thulin in nearby Lund to view a collection of his contemporary art. Our bus returned to Malmö to pass over the newly opened bridge/tunnel from Sweden to Denmark—very impressive (16 kilometers).

The SAS Royal Hotel in Copenhagen is worth a revisit because of its comfort and convenient location for walks around that beautiful city. The National Museum of Modern Art and the Danish Center for the Arts intrigued us, but the Louisiana Museum of Modern Art in Humleback, easily reached by suburban rail, is most impressive for its setting, collection, and exhibits, and two visits were barely enough to satisfy Peggy and me.

We parted from the other Fellows (of Contemporary Art) on June 6. They were en route to Germany, and we took the overnight ferry (Five Stars of Scandinavia, Inc.) to Oslo, Norway. The ferry serves as a duty-free shopping mall, complete with shopping carts. We went to sleep in our

stateroom in brilliant sunlight and arrived in Oslo in warmth and sunshine. Visits to the Industrial Arts Museum and the Resistance Museum filled our first day, which was concluded with dinner on the waterfront with Ted Warren. Ted is an old-time family friend who was living and working in Oslo and had been teaching there earlier. On the second morning, we took a wonderful three-hour city bus tour with a very good guide, making four stops: the Viglund Sculpture Park, the Holmenkollen Ski Jump, the Viking Ships Museum, and the ship “Fram” in which Roald Amundson set out for the North Pole in 1910. When we traveled on our own, we tended to take naps in the early afternoon, but that still allowed us time to visit a museum in the late afternoon. In Oslo, our favorite was the Munch Museum. The awesome collection of Edvard Munch paintings is displayed in large, modern space. We had become acquainted well enough with the metro (“T”) that we could always find our way back to our Oslo “home”, the Bristol Hotel.

Our next step was Bergen, reached in 6 ½ hours via the Oslo-Bergen express that crossed the Norwegian mountains, with Finse at its highest rail station. About two hours out of Oslo and through a few tunnels, the spectacular scenery began to reveal itself: evergreen forests, melting snow fields, rushing rivers and streams, an occasional mountain cabin, and craggy peaks. Hiking trails and ski lifts indicated a seasonal human presence. An easy taxi ride from the Bergen railway station brought us to our Hotel Strand, where we occupied a two-floor suite with entrance on the seventh floor. It was breezy and cool, with an all-encompassing view of the harbor, the wharf, and the daily markets. For orientation on our first full day, we joined a walking tour that included three nearby museums. Bergen is an ideal town for strolling. The next adventure was an 8-minute ascent by funicular (Flolbanen) to an observation point and restaurant from which one had a spectacular view of Bergen and its surroundings. A day of rain—our first—directed us to more museums, the major ones being located next to the lake and beyond the train station. The Bergen Museum of Art had a wonderful show of “The Oceans” over the ages. The Contemporary Museum was showing four major artists. A short ferry boat ride took us to the Bergen Aquarium—penguins, seals, and many specimens from Norwegian waters, plus a movie. We stayed for the feeding of the seals and penguins. The best dinner in Bergen was at a table beside the window of the Pelican Restaurant overlooking the harbor. The road to Bergen airport is spectacular, passing through tunnels past rhododendron groves and lakes, and the airport is colossal.

The flight to Amsterdam on KLM traversed broad stretches of the North Sea (surprisingly few ships) and Dutch islands. Our lodging in Amsterdam was the Hotel Estheréa, on the Singel, convenient for walking

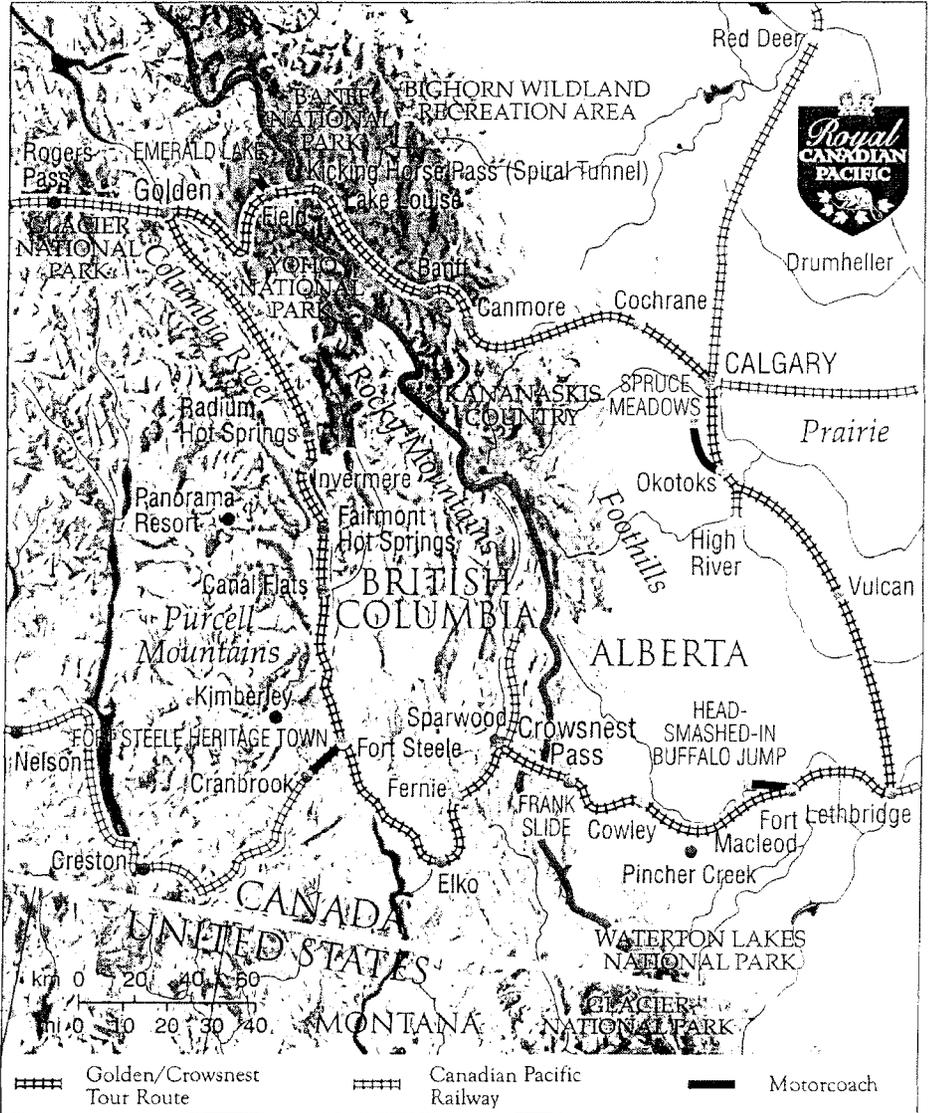
and for dinner at a nearby French restaurant, d'Theeboom. After breakfast in the hotel lobby, we were off to the Rijksmuseum, where we enjoyed the Albert Cuyp exhibit (cows and landscape), the Vermeers, the "Nightwatch" of Rembrandt (newly restored), a van Gogh self portrait, and beautiful porcelain. A trolley ride brought us back to the hotel and a meeting with sister-in-law Els, whom we took to a lengthy lunch at d'Theeboom (well worth the second visit). Extending the gustatory experience after more walking, we had a very special dinner in d'Vijf Vlieghe (The Five Flies) in a 17<sup>th</sup> century setting. Friends Larissa and Eric came to the hotel for our final breakfast, and Larissa Roelofs drove us to the airport for our flight home via Washington, D.C.

During our 2002 summer in Desbarats, David and Georgia Welles described a **Royal Canadian Pacific** rail trip that they had taken in the spring. Peggy and I were well pleased to learn of their enthusiasm because we had already signed up to take the same luxurious railway adventure in the fall. Together with Chris and K.B. Schwarzenbach who had initiated our participation, we flew via Air Canada from Los Angeles to Calgary on September 26 for the start. Met by limousine at the Calgary Airport, we were whisked to the Fairmont Palliser Hotel for check-in, welcoming reception, and dinner. After breakfast the following morning, we departed from the Canadian Pacific Railway Pavilion with its entrance directly from the Hotel, Boulevard Level. The Royal Canadian Pacific consists of an elite fleet of CPR business and parlor rail cars, built between 1917 and 1930 and refurbished in the original style of the period. Our train was composed of two engines, one service car, and five Pullman-style steel cars. Peggy and I were assigned to the "N. R. Crump," named after a Westerner who had started working for the CPR in 1920 and had risen to the top job. This car had been built in 1930 as a parlor car with two rows of 15 swivel armchairs and had been refurbished to contain six staterooms, each complete with toilet and shower. As a railroad enthusiast, I also have to tell you that it has six axles, is 84 feet long, and weighs 100 tons. Our quarters were indeed luxurious as were the 22 other staterooms on the RCP occupied by guests and staff. Three meals per day were served in the observation car "Mount Stephen" and business car "Royal Wentworth" and were provided by two chefs, both French-trained, who posted astonishing menus each day. Drinks and snacks were served at all hours according to the desire and need of the passengers. There was local musical entertainment at night after dinner when the train was at rest on a siding. The air-conditioning (or heating) also functioned during the night.

On the following page is a map I have included for ease in following our travels.

# GOLDEN/CROWSNEST EXCURSION ROUTE MAP

A 650-mile tour through the Canadian Rocky Mountains and Prairies



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Thus, you realize that our creature comforts were amply, even excessively, satisfied. Now, what did we see?

Over 600 miles of the Canadian Rockies  
Bow River Valley  
Banff and Lake Louise  
The Spiral Tunnels of the CPR (actually, we *saw* only the entrance and exit)  
At Golden, the junction of the transcontinental main line and the old “coal route”  
The Columbia River Gorge  
“The Rocky Mountain Trench,” the continent’s largest natural wetland  
Ivermere, first overnight stop  
Cranbrook and the Canadian Museum of Rail Travel  
Old Fort Steele, lunch and a historic tour  
Crowsnest Lake, for a windy overnight stop at Crowsnest Pass  
Fort McLeod for a motorcoach ride to Head-Smashed-In Buffalo Jump (a World Heritage site) and a tour of the site that provided the native tribes with food and clothing for the winter. A 10-minute film features a re-enactment of a buffalo hunt.  
Lathbridge—“the tallest railway bridge in the world.” We had the opportunity to see the high level bridge from below by motor coach, to walk out on it, and to travel across it on the train.  
Okotoks, for a motor coach excursion to Spruce Meadows, site of the foremost International Show Jumping Facility. We were given a private exhibition of equestrian skills. We stayed overnight on a siding in Okotoks, where some of us took the opportunity of touring the train, from primary engine to the observation car.  
Conclusion of the rail tour through rolling ranch country and into Calgary, a walk downtown, and a final overnight at the Palliser Hotel.

The week of October 24-30 found us in **England** again, with all arrangements made efficiently by Peggy on the computer. Upon arrival at Heathrow Airport, we took a limousine directly to Oxford and our very convenient Old Bank Hotel in the High Street. One never tires of walking around that university town. The primary reason for our visit on this occasion was to see granddaughter Megan in her college, Harris Manchester, where she was spending her year abroad from Middlebury College, Vermont. Although she was having tutorials, she managed time

for us. One event was a dinner in Harris Manchester when we met her friends and, afterward, heard one of them, Amir Satuat, play the piano in the chapel. Amazingly, Megan's "digs" were very near the rooms in Manchester Road that my best Oxford friend, David Harris, had occupied during 1937-1939. Peggy, Megan and I had lunch in the senior Common Room of Lincoln College with Rector Paul Langford and Development Director Alice Gosling following a tour of old and newly refurbished facilities in my college. The restaurant in the Old Bank Hotel is very popular, especially on a Saturday night, with the young people of town. That is where we treated Megan and her friends to a very noisy dinner. Although we were probably the only grandparents in the bar and dining area, we had a good time and could enjoy conversation with our nearest neighbor. Amir, who is a young financial expert and also a hopeful composer, appeared to enjoy himself, as did the Middlebury classmates. Peggy had one shopping excursion with Megan, during which I was meeting with the Drickamers' son Kurt, who has become a Professor in the Glycobiology Institute of the University of Oxford. We talked about his new book, "Introduction to Glycobiology," his late father, and his intension, by now realized, to become a British subject. Harry was always reticent to talk about the accomplishments of his children. Kurt is a terrific scientist!

On the weekend, it was arranged that we would have a reunion with Rodney Parsons in Wallingford at the home of daughter Susan (De'Ath) who had prepared an elaborate dinner and had included Megan as a guest. Various family members provided us with transportation: Megan from Oxford and return, Peggy and I from Oxford and to London, where we stayed at our favorite Basil Street Hotel. The notable things that we did in London were to roam the bookstores, visit the New Tate again, cross the Millennium Bridge, attend a play, and take Michael and Jillie Parsons to dinner at the Tante Claire Restaurant in the Barclay Hotel. This Parsons pair had looked after Megan's possessions when she had first arrived in England and had not yet settled down. Alas, that model of gourmet excellence in the Barclay is no more. We were tired when we returned home from London; our visiting had been rather intense.

The American Association for the Advancement of Science (AAAS) and the honorary scientific society Sigma Xi advertised a 17-day expedition to **New Zealand** for an introduction to the flora, fauna, geology, and Maori culture. Peggy and I decided to join the expedition and were on our way on November 8, 2002. Upgrades were not available on United Airlines from Economy to Business Class, so we bit the bullet and were upgraded from Business to First Class for the long, overnight flight. The reclining

comfort was worth it. We arrived with sufficient energy to roam around the area of Auckland that was devoted to the boat houses where there were exhibits of the contestants for the America's Cup. While we were in Auckland, competition was continuing for the Vuitton Cup that would decide who could challenge Team New Zealand. A general feeling of excitement pervaded America's Cup Village and especially the bars and restaurants near the wharves, where the crews were eating their lunches and dinners. After a partial day and a full night of rest, we were ready for further Auckland sightseeing, including Sky City, an entertainment center, and Sky Tower. It was somewhat disconcerting for us, while enjoying the view from the observation and dining level at least 600 feet high, to see a body go hurtling past, part of an organized bungee jumping opportunity. Somehow, we did not avail ourselves of the opportunity. From the highest level of the tower accessible by elevator, it is possible to see the city and surroundings of Auckland, including the harbor, Hauraki Gulf and the many islands, and the volcanoes—now extinct—that surround the area.

When the tour began on the following day, we met the other twelve members plus our delightful guide and leader, Ron Cometti, a foremost naturalist, artist, and author, who made the expedition a very special experience for all of us. A bus ride around Auckland included stops at the Auckland Museum, the Albert Park, Auckland University, and old Government House, and terminated at our hotel for dinner and further orientation. An all-day catamaran excursion to Tiri Tiri Matangi was one of the highlights of the tour. The island is a nature preserve where indigenous plant and bird species exist or have been reintroduced. All predatory mammals have been removed; accordingly, New Zealand's rare, endangered bird species roam freely in the rain forest. Our recognition of the birds and bird calls did not come up to Ron Cometti's expectations, but Peggy and I gradually accumulated some favorites, either seen or heard. The birds paid little attention to us human invaders of their territory. Our checklist included the bellbird (small, with a tuneful loud song), stitchbird, parakeets, kokako (has blue wattles), whitehead, grey warbler, tomtit, weka (walks about, very inquisitive), and kakapo (large and flightless). Our identification of trees also disappointed Ron, but we could finally come up with a few names upon repeated request: Kouri and Kahikatea (very tall), matai and totara (very bushy), red beach, rimu (the young tree has weeping foliage), cabbage tree, pukatea (buttressed and breathing roots), and many tree ferns. The many mosses defeated us. We could not leave the island from the bay where we had arrived because the surf was too strong. This required a diversion: a trek to the leeward side of Tiri Tiri Matangi and a walk/slide down a cliff face to the beach. The

small dinghies were lowered down the cliff by rope to join us on the beach. Then, we were rowed into the fairly calm bay to clamber onto the yacht that had brought us out to the island. The rough water had caused cancellation of the Vuitton Cup competition that day. We were shown only the general course that was set, and we had to be satisfied with television coverage (much better) of the later trials.

The bus route from Auckland to Rotorua passes through Rainbow Springs, where New Zealand's wildlife is exhibited in natural bush settings. There we could view the nocturnal kiwi in a black-lighted enclosure and the tuatara, a "living dinosaur," who follows the dictum, "the less motion, the better." Trout are also being raised in the springs for the sport fishing for which New Zealand is famous. Further along on the journey, we were treated to a guided tour of the Whakarewarua Thermal Reserve and the Maori Arts and Crafts Institute. We departed our Rotorua hotel in the early evening for a traditional Maori hangi dinner at a Maori marae. The word "hangi" means welcoming and refers to butting foreheads and rubbing noses. The marae is the communal living area. We were joined by a Maori guide, who described what the meeting, the dinner, and the celebration would be like. We would have to elect a "chief." As the oldest member of the group, I was "elected." We (especially the chief) would have to behave in an attentive but non-aggressive manner when threatened by the village chief, and we would have to sing a song in response to the Maoris' song of greeting. I resurrected the following from early Boy Scout days:

*Hello, hello, hello, hello  
We're glad to meet you  
We're glad to greet you  
Hello, honored Maori, hello*

We practiced on the bus. When it became our turn to perform, I sang it through once, and then my team joined me in enthusiastic unison. I overheard the chief say to his neighbor, "Well, that was different! No 'Row, Row, Row Your Boat' or 'Three Blind Mice'." The feast was a good one. We returned to the hotel amused and satisfied. I remained the "chieftain" of the tour, but I accepted no further duties and was offered no further rewards.

After a flight from Rotorua to Christchurch on the South Island, we toured the city, including the Canterbury Museum and the Botanic Gardens. We enjoyed a superior dinner at the Sign of the Takahe with our guests Murray and Mary Munro, whom I had not seen in 20 years, i.e.,

since my first visit to New Zealand. Murray is a Professor of Chemistry at the University of Canterbury who spent some research time at the University of Illinois with my colleague, Kenneth Rinehart. Additional sights in Christchurch were the fascinating Antarctic Centre, which included the opportunity of experiencing (briefly) the extreme cold, and the gardens of Mona Vale, where we had lunch in the Homestead. Add the Arts Centre and the McDougall Art Gallery. A bus trip took us through Arthur's Pass and the Southern Alps. At times, the road is parallel to the narrow gauge rail line that crosses the Alps and provides an alternative method of seeing the gorges and mountains. In Arthur's Pass National Park, we took a short bushwalk to look and listen for birds again, including the mountain kea, and then we continued to the West Coast, where we viewed the Pancake Rocks, fascinating limestone formations, and geyser blowholes in the Paparoa National Park. We stayed in a hotel on the quay. It was either in Greymouth or in Franz Joseph Glacier that I made a surprising personal discovery. Ron Cometti and our bus driver, who had only divulged his first name, Roger, asked me whether I had known any New Zealanders professionally. I responded that I had known some chemists, and one in particular, Ian Coop, who was my lab partner in the Dyson Perrins Laboratory, Oxford, during 1937-1939. I elaborated on his career: he had done exceptional physical chemical (Ph.D.) research at Oxford following a three-year bachelor's degree at Cambridge in biochemistry and animal nutrition. Since he was born and bred on a sheep farm in New Zealand, he knew how to manage such a farm when he left high school. He had returned to New Zealand in 1939, just when I returned to the U.S., and had volunteered for the army, but was whisked out of it to join a small group being assembled to develop radar. He helped build the first radar in New Zealand by October of 1941, and within six weeks of that, he was on his way to London to be Scientific Liaison Officer to keep New Zealand informed on all the science and technology of warfare being developed in Britain. He married an English girl he had first met in Oxford in 1938, and they returned to New Zealand in 1946, where he became Professor in Animal Nutrition and was offered a research farm of 1500 sheep. His "meet before and marry after the war" experience was parallel to mine.

I might not have had all of Ian Coop's facts correct at the time, but, in a letter I received in January of this year, he kindly provided accuracy. But, to go on with my description to Ron and Roger, who were listening attentively. The result of his research on sheep breeding was the Coopworth Sheep. About seven million of them roam the high country, and the ewes are special in that they can take care of themselves in birthing

and they can even take care of twin births. When I had finished my praise of Ian Coop, Roger, our bus driver, said somewhat dryly, "Yes, he is my second cousin." Roger's second name, which had not been obvious to us, was Coop. The upshot of this denouement was that I telephoned Ian for a long and satisfactory talk and then convinced Roger to renew his contact with his 88-year-old, now-fairly-inactive cousin. The other conclusion to be drawn from this story and reaffirmed is that New Zealand has a small population (of people).

The trip continued to Franz Josef Glacier, Fox Glacier, the face of which we could reach by a hike, then back to Franz Josef Glacier (the town) for our overnight. Our drive continued along the beach to Haast, named for the Austrian who had discovered and named Franz Josef Glacier, where the Visitors Center treats one to well-presented views and exhibitions. As a matter of fact, the New Zealanders have created wonderful centers throughout the islands for the education of their own youngsters as well as tourists. We interrupted our trip on the transalpine highway with a short walk to Thunder Creek Falls, where the tree ferns and giant trees are covered with epiphytes, and we had lunch at a working sheep station, Glen Dene, overlooking Lake Hawea. The beautiful house and garden, which constitute the headquarters of the station of 20,000 acres that is home to 8,000 sheep and 200-400 deer, is also a fabulous B and B. We resolved to spend time there if ever we travel to New Zealand again. We continued past Lake Wanaka, a popular holiday location and the fruit-growing region of Cromwell, to reach Queenstown on Lake Wakatipu. This is a favorite tourist stop, as I had recalled from 20 years ago. A short ride on the Lake on the "Earnslaw" took us to a working sheep farm where we had lunch.

It was not so much the sheep-shearing demonstration or the dog roundup of the sheep that I think of when Queenstown is mentioned as it is my holding of a very young lamb in my arms. I scratched its neck, held it tight against my chest, and told it that I had never held such a beautiful lamb before this. Gradually, the lamb closed its eyes and then licked my face. I also achieved the closed-eye response by talking to and stroking the neck of an antelope that was in an enclosure on that farm. My fellow travelers had only been staring at it. What animal communication! From Queenstown, the road to Te Anau took us through sheep-farming country, and Te Anau was our starting point for the trip to Milford Sound. Bright sunny weather prevailed, so that we saw the fjord under the best possible conditions. Our experience was unique in comparison with that of many friends who had journeyed to Milford Sound, only to be sequestered in fog and rain. A cruise to the mouth of the sound provided us with continually

changing vistas, and a stop at the underwater observatory gave us spectacular views of the sea life at various depths.

The return trip to port and bus return to Te Anau brought us to the Te Anau Wildlife Centre, where we could see the rare and once-endangered flightless bird, the takahe. At Invercargill, New Zealand's southernmost city, in the Southland Museum, we learned more about the tuatara, the ancient lizard, from an experienced naturalist who believes that all infants' survival and health are related to early exposure to sunlight. It is a short flight from Invercargill to Stewart Island, where Half Moon Bay is the only permanent settlement. At the very simple South Seas Hotel where we stayed, another naturalist, also a "Ron," lectured us on the flora and fauna of the small, southernmost islands. By this time, I was suffering from a steadily more severe chest cold. I elected to stay close to our Stewart Island "home," while Peggy joined the chilly day cruise to Ulva Island for some great and easy birding. She saw and/or heard practically all of the species indigenous to that part of the world.

The road from Invercargill to Dunedin included the Catlins Coast Forest Park, with stops to view the spectacular caves en route. At Nugget Point, the Australian gannet, southern blackbacked gulls, spotted shags, and New Zealand fur seals could be spotted. In Dunedin, a visit to the Marine Studies Centre of Portobello on the Otago Peninsula gave us a final opportunity to learn about the ecology of local species, supplemented by a talk on conservation issues. We missed seeing royal albatross and yellow-eyed penguins that I had seen 20 years earlier because I was really unwell by this time, and Peggy was a dutiful wife, looking after me and reading while I slept and slept after we returned by cab to the hotel in Dunedin. We said goodbye to Roger, our driver and story-teller, at the Dunedin Airport and to Ron, our knowledgeable guide, at the Auckland Airport, where we took off on the long flight to Los Angeles and home, feeling very lucky (and wise) that we had opted for first class tickets.

## 2003

A voyage on the M/V Sea Bird along the Columbia and Snake Rivers in the wake of Lewis and Clark served to celebrate the anniversary of that remarkable Corps of Discovery. Our ship covered nearly 1000 miles: Portland to Clearwater River in Idaho to Mouth of the Columbia River at the Pacific Ocean, and back to Portland, Oregon. The trip capped our dozen years together.



## Appendices

### HOW WAS MY RESEARCH SUPPORTED?

**D**uring the period that I worked on antimalarial drugs, encompassing the years of the second World War, research funding came from the Committee on Medical Research of the Office of Scientific Research and Development (OSRD), U.S. For such parallel research that was accomplished with undergraduate seniors, we simply relied upon the stockrooms of the Department of Chemistry, University of Illinois, to provide the necessary apparatus and chemicals. The costs were probably assigned to a numbered course that related to senior undergraduate research. The department budget was fairly flexible up to a point. Items costing more than \$100 were referred to the Head of the Department, Roger Adams, who was adept at questioning their necessity. Equipment and chemicals could also be charged to graduate research, with another course number. The State of Illinois, after a time, decided that it should not be supporting research in the University. When that happened, the Research Board of the University of Illinois, which had access to other funds, became a source of modest grants upon suitable application.

The graduate students were supported initially as teaching assistants and, in subsequent years, on graduate college fellowships awarded competitively, on industrial fellowships, either awarded or assigned to individual faculty members, or on National Science Foundation fellowships. Ten years passed before I received an unrestricted grant which came from E. I. DuPont de Nemours and Company, Inc. In 1950 and thereafter, they bestowed unsolicited grants on a number of university chemistry departments in clear recognition of the need that existed for unrestricted funding of research, especially for young investigators. What a blessing it was for me, the Illinois recipient! I could put new research ideas to work, and I was able to hire my first postdoctoral research associate, Dr. Hugh L. Dryden, Jr., from M.I.T., as well as continue my teaching assistants as research assistants. In 1958, I received my first research grant from the National Science Foundation, support that continued for 30 years. In 1960, funding came from the National Institutes of Health, and that was continued for 29 years. I was very grateful for such sustained aid.

It was, however, the freewill gifts that activated expeditionary research. In the forefront of these was a year-by-year grant from the Hoffmann-LaRoche Foundation during 1963-1965, 1970-1977, 1979 and 1981. These university grants were initiated by Dr. Arnold R. Brossi on behalf of the Foundation, and he encouraged other Swiss pharmaceutical companies to contribute to American universities in this manner. Another freewill gift came from Dr. Alfred Bader in 1978 in the form of Aldrich Chemical Company stock that was converted to cash immediately by the University of Illinois Foundation before they—and I—could realize its huge run-up in value. Eli Lilly and Company, for whom I consulted, was always supportive of my research and especially so when it purchased my accumulated research samples from the University of Illinois for pharmacological and agricultural testing. An unrestricted research grant was received from Marion-Merrell-Dow through the good offices of Dr. Douglas L. Cole, Director of Chemical Research, that was crucial to the conduct of my post-retirement research from 1991. I also provided personal funding until my Illinois laboratory was shut down in the summer of 1996 following the successful completion of my final two important research projects.

## SERVICE ON GRANTING FOUNDATIONS AND AGENCIES

My old boss at the University of Illinois, Roger Adams, in his role as President and Member of the Board of Directors of the American Chemical Society, was instrumental in arranging the transfer of funds from Universal Oil Products to the ACS as directed by the U.S. antitrust action. When I was asked to serve on the **Petroleum Fund Advisory Board of the ACS**, I of course agreed. I remained on the Board for only one year, 1954-1955, and I declined further service because the applications for research grants were related too closely to petroleum chemistry for me to have been a good judge of their relative merit. In the years that followed, the scope has broadened, and the PRF has become a major funding agency for fundamental and applied research in chemistry.

Roger Adams was foresighted in this and in many other programs in which he provided the initial impetus. When Alfred P. Sloan and retiring fellow members of the Board of Directors of General Motors indicated their interest in promoting the basic physical sciences in the United States (1953), the planning for the new program in basic research was undertaken by a special committee headed by Adams. The committee's recommendations included three elements which gave the existing program its general shape. First, they proposed that support be granted

for the use of individual scientists; second, that those scientists be sought in educational institutions where “the general climate favored research;” and third, that “special consideration be given to younger scientists of marked promise.” All three of those recommendations have been scrupulously followed during the subsequent years.

In 1973, there appeared a 23-page document, “**Sloan Fellowships for Basic Research. An Evaluation,**” from which I quote because it is exceptional:

“The evaluation of the Sloan Fellowships for Basic Research has not followed that customary pattern. Upon all the central questions concerning the program, there have been uniform judgments out of which has come a uniform conclusion: Those consulted assert without exception that the program, as it exists today and as it has existed since 1955, has been an unqualified success. To this they add, again without exception, that the program or something very much like it should be continued into the future. On the details of the program—its administration, the fine structure of the criteria under which it operates—there have been a few isolated suggestions for change, none of them central to the program, and none of them deeply held by those who put them forward.

“That unanimity was recorded in the course of visits to twenty universities, in every section of the country, and less formally in discussions that took place under a variety of circumstances when opportunities arose. Those who contributed to it include past Sloan Fellows, potential Sloan Fellows who were nominated for fellowships but subsequently denied them, department heads, and assorted scholars in the fields of physics, chemistry and mathematics. It has been recorded over the years, by representatives of every institution involved in the program, who have transmitted unsolicited communications at the close of their fellowships, when no more was to be expected of the Foundation. It extends, finally, to representatives of professional and governmental groups including Science Advisors to the President, past and present.

“The word ‘unanimity’ is not being used loosely. The central responses of all those interviewed and the

volunteered comments of those who communicated with the Foundation, were in substance identical. The peripheral differences will be faithfully recorded later in this report, but they do not affect the central conclusion to be found in every response and every communication: the Sloan Fellowships for Basic Research have been a resounding success among those they serve.”

Dr. Richard T. Arnold, who was a Ph.D. student of R. C. Fuson, University of Illinois, was the original Program Administrator. He was succeeded by Dr. Larkin H. Farinholt, a chemist who had been a famous lacrosse player at Johns Hopkins and a Rhodes Scholar. I served with “Monk” Farinholt when I was on the Program Committee in the Basic Physical Sciences, Alfred P. Sloan Foundation, during 1961-1967. The advisory committee was composed of two scientists from each of the four fields covered by the program. My cohort in chemistry was Henry Taube (1961-1965), then at the University of Chicago and more recently at Stanford University, followed by Franklin A. Long (1965-1967) of Cornell University. When I went off the committee, the chemist members were Frank Long and E. J. Corey, Harvard University. Continuity was provided by the overlapping terms. Our gratification came from selecting brilliant young scientists at the beginning of their careers for the award of research funds that they had little reason to expect. What a gift! What a boost to their careers! My feelings are best appreciated by quoting from the letter I wrote to Dr. Everett Case, President of the Alfred P. Sloan Foundation, in December, 1966:

*“It is with a feeling of deep appreciation for the most rewarding experience that I come to the end of my second and final term on the Program Committee in the Basic Physical Sciences. Beyond the pleasure of serving with a delightful group of scientists as advisory to a most able program administrator, I have had the gratification of following closely the work of the young chemists of the United States and Canada and helping in the selection, as Sloan fellows, of the most promising among these.*

*“The present program is the single most important means of supporting the research of outstanding young physical scientists. Referring to chemistry alone, the Westheimer report (“Chemistry: Opportunities and Needs”) indicated an expenditure of \$2,400,000 in 1964 for the support of basic research by “all other private foundations.” Thus, the Sloan Foundation has the most impressive record of support among foundations and makes a considerable contribution among all granting*

## MORE THAN A MEMOIR

*sources (total granted in 1964 was \$64,300,000). Even more important are the factors which distinguish Sloan Foundation support—unsolicited grants, accent on youth, selection by quality alone. The function of our Program Committee is not, indeed cannot be, duplicated by Federal Government granting agencies and is now more important than ever before due to increasing restrictions—amount, geographical distribution, mission orientation, reporting, overhead disbursements, etc.—on federally available grants and contracts.*

*“I urge you to maintain and to increase, as advisable and possible, the contribution you are making to basic science and to young scientists. I thank you and the Board of the Foundation for giving me the pleasure of having been part of this program. With best wishes.”*

During the first attempt of the U.S. Congress to set up a **National Science Foundation**, I had appeared before the science adviser to the U.S. Senator from Illinois to argue the plight of the young investigator in a university. After World War II, there was very little, if any, research funding available to beginning instructors or assistant professors of science. The intended legislation was not passed during the Truman administration but a bill instituting the National Science Foundation was finally signed by President Eisenhower. Prior to my service on the Program Committee of the Sloan Foundation, I was a member of the Panel for Chemistry of the National Science Foundation during 1958-1961. This was a most enjoyable period because we received many excellent applications, there was adequate funding for the majority of these, and the panel members for organic chemistry, namely, Jack Roberts, Caltech; Gilbert Stork, Columbia University; Stanley J. Cristol, University of Colorado; and I had no trouble coming to consensus in the selection process. The experience was actually uplifting as well as enjoyable because we had the feeling that we were really catalyzing the scientific discovery process and supporting original ideas for meritorious research. Walter J. Kirner as Chairman of the Foundation's Advisory Panel for Chemistry and Alan T. Waterman as Director of the NSF were ideal, dedicated scientists/civil servants. An added personal dimension to the enjoyable nature of the visits to Washington, D.C. was derived from the presence there of Nell's younger sister, Hilda. Her husband, Paul Renardel de Lavalette, was an officer in the Netherlands Embassy during the first half of my NSF advisory period. This meant that Nell and I or the whole family could combine my work with brief family reunions and could also bring mutual friends together. During Eisenhower's administration in Washington, the mood there was very positive and optimistic, something that has been difficult to recapture.

I also served on the Postdoctoral Fellowship Committee (1961, 1962) that had been initiated by the National Science Foundation and then continued with Washington/Bethesda visits as a member of Study Section B, Medicinal Chemistry, of the **National Institutes of Health** for two terms, 1963-1967. One must serve on an NIH study section in order to realize the effort and time that go into the process of peer evaluation of research proposals. I had full confidence in the procedure as it was organized during my experience as a committee member. There were volumes of proposals to be studied, judgments were read aloud and defended or amended before fellow experts on the study section, and priorities were assigned confidentially. During the period of adequate funding availability, I felt good about the results at the end of the deliberations at each Bethesda meeting and also proud of the objectivity that had been exercised throughout the process.

The **Searle Scholars Program** was created in 1980 to support research in the biological sciences, medicine, and related chemical sciences. I suppose I was made a member of the Advisory Committee of the Program, which was administered under the Chicago Community Trust, because of my possible contribution to selections in the last category. The Program was funded from trusts created under the wills of Frances C. and John G. Searle, grandson of the founder of the pharmaceutical company, G.D. Searle & Co. Members of the Advisory Committee on which I served for a term, 1982-1985, were charged with recommending three-year awards to support the independent research of persons in their first or second year as assistant professors. The Searle program was thus similar to the Sloan Fellowship Program in that it was intended to support young investigators, a process that I thoroughly enjoyed.

The difference in that advisory process for me was that I had to stretch my mind to be a useful committee member in the selection of candidates in the biological sciences and medicine as well as the chemical sciences. A broader difference between the Searle and Sloan Programs was the Annual Scientific Meeting of the Searle Scholars when second and third year scholars, all of whom were awarded grants for three years, reported on the progress or partial completion of their research work. A fifteen-year analysis of the Searle Scholars Program indicated that the seeking of individuals who had already done innovative research and who had given evidence of potential to make significant contributions to biological research over an extended period of time had been conspicuously successful. About fifteen scholars were selected each year. The Annual Scientific Meetings were special for bringing together the most promising young people in the health sciences in the United States and for giving us

all an opportunity to hear about “hot” research results at an early stage. For me, it was an excellent learning experience.

What made the Searle Scholars Program run smoothly and successfully? Dr. Cedric L. Chernick was the Director of the Program for its first fifteen years. His capability of encompassing and understanding a variety of disciplines in the health sciences was unique. His evenhanded assessment of quality satisfied all of us who worked on the Committee. His enthusiasm for assisting young scientists never declined in intensity during his years of service. He kept us well-informed during the selection process and about the later research progress of each individual. I ended a congratulatory letter about Cedric in 1996 with “There are few paragons in modern society. If there were such a thing as a ‘Paragon Prize,’ however, I would nominate Cedric L. Chernick for it in the context of his fifteen year tenure as Director of the Searle Scholars Program.”

The **John Simon Guggenheim Memorial Foundation** was established in 1925 by United States Senator Simon Guggenheim and Mrs. Guggenheim as a memorial to their son who died in 1922. In accordance with their letter of gift, the Foundation offers fellowships “to further the development of scholars and artists by assisting them to engage in any field of knowledge and creation in any of the arts, under the freest possible conditions and irrespective of race, color or creed.” Further, “the fellowships are awarded to men and women who have already demonstrated exceptional capacity for productive scholarship or exceptional creative ability in the arts.” The quotations are from the annual announcement of fellowship competition in the United States and Canada. These grants are thus different from those provided to young people, and only scientists, that I have described for the Sloan and Searle programs. I was fortunate to receive a John Simon Guggenheim Memorial Fellowship in 1959 for my study in Basel, Switzerland in 1960 and doubly lucky to receive a second Fellowship in 1967, which I used for study at the University of Wisconsin, Rockefeller University, and the Technion in Haifa, Israel. At the present time of writing (1997), renewal of a fellowship is no longer possible because of a greater demand for a lesser amount of money available.

Henry Allen Moc, who had the original inspiration for the provision of fellowships, was a Trustee of the Foundation during 1945-1966 and President, 1961-1963. He was my benefactor in 1939, when he provided, through the Carnegie Foundation, welcome scholarships to Rhodes Scholars who had been forced to return home from Oxford and enroll in U.S. universities at the outset of the second World War. He was also my inquisitor on an oral examination in December of 1936, when I was applying for a Rhodes Scholarship and had to submit first to examination by a state

selection committee and then a district committee. I still recall some of the questions I was asked during those impressive, weight-reducing sessions. Dr. Moe was intrigued, and perhaps bothered, by the disclosure that I was a teetotaler, and he probed the reason and aspects of one's being abstemious. He was finally satisfied that I was simply following my parents' wishes in this regard, was not prejudiced against people who drank, and, in fact, could envisage some time in the future when I would come to appreciate wine and beer. His final remark was something along the lines of "When that time comes, do not hesitate to lay down a case of Chateau Yquem for future consumption." This was advice bestowed on an absolute innocent but nevertheless remembered and valued some twenty-five years later. Gordon N. Ray became President of the Guggenheim Foundation during 1963 to 1985. He moved to that position from this Deanship of the College of Liberal Arts and Sciences of the University of Illinois, where I knew and admired him.

It was probably our experience of working together at Illinois that encouraged Gordon to have me appointed to the **Educational Advisory Board** of the Foundation. This is the intermediate group that assembles according to priority the fellowship applicants in one or more disciplines. Careful scrutiny and comparison of all the applications and supporting material was necessary. The timing of the arrival of the chemistry packet was usually not ideal because it tended to arrive in the middle of a family Christmas vacation in Aspen, Colorado. However, any vagary of priority ordering on my part would always be counterbalanced by comparison and compromise with the corresponding listing by my science cohorts on the Advisory Board, whoever they would be at the time.

My apprenticeship as a member of the Educational Advisory Board was rewarded by appointment to the Foundation's **Committee of Selection** in 1977, which was renewed for several terms adding up to twelve years. I have only the most pleasant memories of that period, although the work was intense at times. In the first quarter of each year, I would receive package after package of applications by discipline. I read very thoroughly the fellowship applications in science as I was expected to do, but I also read all of the applications in other fields that had been screened by appropriate members of the Educational Advisory Board. The maximum number I could read would be about 2000 in any one year. The time invested was about five weeks including all weekends and most evenings. I considered it a learning experience in language, literature, history, social sciences, art and architecture, and many other subjects. Some of the best minds in the country were telling us what they were thinking about and what they had done and still hoped to accomplish. Each year was an academic feast, extending to the two days in New York when all of the priorities would be merged in full

Committee. We tried to reward the very best at the same time that we made certain that no candidate was passed by without having received thorough consideration during the process. The other members of the Committee of Selection were superb. Some became good friends. Their sociability, which was also a rewarding experience, was celebrated in the working lunches and in the annual dinner with the members of the Board of Trustees. My life was greatly enriched during the twenty years that I was entrusted to advise with selection of Fellows of the John Simon Guggenheim Memorial Foundation.

## CHEMISTRY—SUBSIDIARY ACTIVITIES

It became obvious to me that my University of Illinois colleagues were involved in activities in addition to teaching and research that were related to the chemistry profession, namely, service and consulting. I already had experience with the latter because of contracts with Eli Lilly and Company in Indianapolis and the Central Research Division of Monsanto in Dayton, Ohio. I was first coopted into the service experience in the following manner. "Speed" Marvel returned from a Canadian fishing adventure with Ralph Shriner, University of Iowa, and Arthur C. Cope, M.I.T., in the summer of 1948. While they were visiting briefly in Urbana, Ralph and Art combined forces to tell me about the affairs of the Division of Organic Chemistry of the American Chemical Society. Each had taken a turn as Secretary of that Division, which neither regarded as a chore because of the opportunities of becoming acquainted with a multitude of organic chemists and becoming well-known in that community. It was clear that I was expected to accept the nomination to be the next Secretary. Elected in 1949 for a five-year term, I did benefit from the contacts, but I found the office to be a considerable chore in an era of rapidly growing membership. I became Chairman-Elect in 1955 and Chairman in 1956, which I regarded as administrative rewards that carried the responsibility of making the functioning of the Division more democratic than it had been in the past.

The *Journal of Organic Chemistry* was founded by Morris Kharasch of the University of Chicago as an independent journal wherein one could publish detailed experimental directions, especially those resulting in multiple products, as often encountered in free-radical reactions, e.g., such as those being carried out in Professor Kharasch's laboratory. I was recruited to serve on the Executive Committee during 1951-1954. When Art Cope was President of the American Chemical Society, I also served on his committee that transferred the Journal to ownership by the A.C.S., and I served on the new Editorial Board from 1957 to 1961. It is not now apparent

to me how one has time and energy to keep adding additional service responsibilities. I am sure that it has something to do with age and that the old adage about assigning work to busy people has some validity. When asked, I have generally given the advice to young staff members and former students to turn down offers of editorships. Such advice was really a challenge. When the advice was not followed, which was generally the case, the conclusion was that the candidate had the energy and drive necessary to add the editorial task and would be successful at it.

I did not follow my own advice. I accepted the next editorial task that was offered, namely, to be on the Editorial Board of the *Journal of the American Chemical Society* during 1960-1969. The task was not onerous; however, being on the Board of Editors during 1969-1972 did require late night work (my choice) of judging, with the help of referees, the articles and communications submitted to that prestigious journal. In the learning process, one finds that certain authors regard criticism of their writing as though it were complaint about one of their children while most authors consider the criticism to be helpful, although they may have come to such a conclusion many years later.

*Organic Syntheses, Inc.* is an annual publication founded by Roger Adams and others in 1920. It purports to give accurate, checked directions for the synthesis of a wide variety of compounds. Volume 78 was published in 2002, and there have been numerous collective volumes. It is still an ongoing operation, but it has changed due to advances in computerization. Well, someone from the University of Illinois has always been on the Board, and up came my turn when Harold R. Snyder had finished his term and I was expected to take his place. At that time, I was skeptical as to the need of the publication since I considered that any procedural directions that I published in a journal could always be repeated with the same result. That was apparently not so in numerous cases; accordingly, *Organic Syntheses* published detailed directions for syntheses that had been double-checked independently by members of its Board of Editors. Still somewhat skeptical, I joined that service operation in 1951, became Editor-in-Chief in 1957, then went back to being a member of the Board of Editors in 1958, according to custom. I served on the Board of Directors from 1969 to 2001, as Vice President, 1978-1980, and President, 1980-1988. During my service, we instituted the Roger Adams Award in Organic Chemistry of the American Chemical Society, sponsored by *Organic Syntheses*, *Organic Reactions*, and the Organic Chemistry Division, ACS—all organizations that Professor Adams helped found.

The great pleasure of being associated with *O.S.* was the interaction with the others on the various boards: first, in deciding what preps should be included in each volume; second, in securing the proper investments to maintain the capital available; third, and certainly most pleasurable,

having dinner together at every American Chemical Society Meeting and Organic Symposium. Strong friendships developed over the years, and there were many gourmet experiences and amusing evenings, touching on the lighter side of those serious chemists.

Service on publications continued to occupy some spare time after the *J.A.C.S.* term, but not at the same level of intensity, on the Editorial Advisory Boards of *Biochemistry*, *Chemistry International*, and *Pure and Applied Chemistry*. The word "Advisory" is key to a less active role. Service on granting agencies and foundations also provided great satisfaction and has been covered in a separate chapter. I helped institute another prize for the American Chemical Society: the Arthur C. Cope Award, together with the Arthur C. Cope Scholar Research Awards. Professors Paul Gassman of the University of Minnesota and Norman LeBel of Wayne State University were the prime movers in deciding the terms of these very valuable prizes. Paul Gassman was later honored for all of his service to organic chemistry by a biennial award in his name that was set up by the A.C.S. Division of Organic Chemistry.

## ASPENYL CHEMISTRY AND BIOCHEMISTRY MEETINGS

Our house in Snowmass Village, Colorado (at first called West Village) was built mainly during 1969 and finished about the end of January, 1970. In addition to family and rental occupancy, a touch of what might be called "occupational occupancy" appeared in the spring of 1975. Nell and I had the idea that it would be fun to invite some of our friends who enjoyed both skiing and chemistry. We would divide the days into those two occupations and would provide gourmet dinners in the evenings, either by cooperative culinary activity or by dining out. The invitees were to be compatible and interesting chemists or biochemists, and it was of course desirable that the spouses be compatible and interesting as well. We invented a name for the venture, namely Aspenyl Chemistry and Biochemistry Meetings. The first part of the name is the locale for skiing. Aspen and Snowmass Village are near but not quite contiguous. The ending "-yl" is generally reserved in chemical nomenclature for a radical. In this case, it denotes the radical nature of the enterprise. *Après-ski* was celebrated with chemistry lectures in the master bedroom, outfitted for projection of slides or overheads on the wall, and furnished with comfortable chairs and liquid refreshment close at hand.

Some rules were introduced to eliminate the trite sayings omnipresent in symposium lectures: at the beginning, "I would like to thank the organizers for the invitation to speak"; at the end, "I would like to thank the audience for their attention." These hackneyed phrases were

prohibited. Another characteristic was that the speaker could be interrupted at any time. In some cases, it was even difficult for the speaker to progress beyond the first slide or overhead. The material presented was to be new and unpublished after the necessary background information had been provided. Audience participation, thus encouraged, led in some cases to modification of research conclusions and in at least two instances, to research collaborations. Occasionally, the talks had to be continued after dinner, but preferably we were treated to other talks outside the realm of chemistry if our energy levels for discussion extended beyond the gourmet meals.

The attendees at the First Aspenyl Meeting were the Cristols, University of Colorado; the Roberts, California Institute of Technology; and the Bartletts, late of Harvard and then of Texas Christian University at Fort Worth. All were old friends. March 22-29, 1975, turned out to be a very blizzardy week, a fact commemorated in poetry of Paul Bartlett. Nevertheless, we skied each day, lectured to each other each day, discussed architecture and art each evening, ate fantastic meals at home, 365 Terrace Drive, Snowmass Village, and at favorite Aspen restaurants. All of the couples, Lou and Paul Bartlett, Edith and Jack Roberts, Barbara and Stanley Cristol, and Nell and I, became closer friends, and we voted in favor of another symposium.

In 1976, we decided to alternate the chemistry with some biochemistry and had a great week with Elkan and Joan Blout and Konrad Bloch, all of Harvard, Hank and Annrita Lardy of the University of Wisconsin, and David and Alice Kearns of the University of California, Riverside and then San Diego. Son Kenneth designed a logo of six aspen leaves arranged in hexagonal fashion for the Aspenyl Chemistry and Biochemistry Meetings, and we had embossed stationery printed for use by the founders and the attendees. I should say that the house has a hexagonal center (structure of benzene?).

It is not my purpose to list all of the attendees, but there were highlights of the conferences that lasted formally until 1995. Some of my University of Illinois colleagues became regular attendees. There were numerous repeaters, chief among them being Jack and Edith Roberts, who provided many ideas for year-to-year improvement of our adventures—skiing, chemistry, and culinary. The conferences became international with the inclusion of Michinori and Fusae Ōki of Japan and Gertraud and Kurt Schaffner of Germany. The skiing included slalom racing (lessons and handicap competitions), improvement of beginners and intermediates, and endurance performances that were believed only by those who claimed to have done the incredible number of downhill runs that were bragged about. Some of the participants preferred cross-country skiing with its added benefit of a cookhouse lunch. There was even competitive sledding down the driveway and Terrace Drive when conditions, both external

and internal, were right. No bones were broken during any of the conferences despite some unusual adventures.

The chemistry and biochemistry were delightful. We were treated to historical developments and to the unveiling of new concepts and new research programs. We heard about host-guest chemistry from Don Cram, who was to receive a Nobel Prize for this work, and about electron transfer from Rudy Marcus, who received a Nobel Prize in his turn. There were topics as diverse as surface chemistry, photochemistry, plant physiology, magnetic resonance imaging, and a possible reason behind instant crib death. From my point of view, one of the most valuable developments was a research collaboration between Jack Roberts and myself. This developed from his expert innovation in  $^{15}\text{N}$  magnetic resonance and my studies on nucleosides and nucleotides. We discovered that together we had the means of solving some research problems of possible general interest. The collaboration resulted in four joint publications and lasted into the time of my relocation to Caltech.

Hanni and Arnold Brossi of the National Institutes of Health, who were enthusiastic members of the Aspenyl Chemistry Meetings in 1977 and 1979, decided, with our blessing, to initiate a similar series of conferences in Laax, Switzerland. The Laaxer Chemistry Conferences were then held biennially in the Casa Fargliuns, Laax Murschetg, in the Graubünden province of Switzerland, starting in 1980. Laax, as Aspen, provided great science and great companionship. Chemistry and hiking or skiing provided a marvelous base for cherished friendship.

## LAAXER CHEMISTRY CONFERENCES

A delightful offshoot of the Aspenyl Chemistry and Biochemistry Meetings consisted in the Laaxer Chemistry Conferences, hosted by Arnold and Hanni Brossi in Laax, Switzerland. In May, 1979, I received a pleasant letter from Arnold suggesting a meeting there in September, 1980. He proposed as attendees (i.e., plenary lecturers), the five couples who participated in the 1979 Aspenyl Chemistry Meeting, namely, the Bartletts, Boekelheides, Brossis, Leonards, and Roberts, supplemented by Albert and Elizabeth Eschenmoser from Zürich. All of us responded enthusiastically. The family chalet in Laax-Murschetg, which contained three apartments, was large enough for the chemical twelve. The name of the house, since all respectable houses in Switzerland have names, was (is) Casa Fargliuns. Laax-Murschetg can be reached by bus from Chur with a change in Flims-Waldhaus, which was well known to Nell and me. It lies at the base of a wonderful ski area, and the hiking trails are equally exciting and interesting.

In advance of the First Laaxer Conference in 1980, Nell wanted to visit the town of Oberstdorf in Germany. She had not seen it since she was fourteen, when she was sent there for better nutrition, exercise, and sunshine after a particularly bleak time in Holland. Oberstdorf looks like a stage set of an ideal village with backdrops of almost imaginary scenery—rank upon rank of mountains rising in the distance. We had flown to Zürich and taken the train from there, including the spur line that terminates in Oberstdorf. Although we were late in arriving at the Hotel Alpenhof, we were treated hospitably and made to feel at home. In a sense, Nell was coming “home” again, and I was taking a retro-snapshot of her life as a teenager. I could understand immediately why Oberstdorf had made such an impression on her. We went to the rest house where she had stayed. It had been converted into an elementary school. We took the chair lifts and came down the mountain walks that were familiar to her. We listened to band music in the village square, and we ate snacks appropriate for the occasion. Our hotel served exquisite food. The only negative episode in Nell’s earlier sojourn in Oberstdorf was the inconsiderate manner in which the ladies who ran the rest house dealt with Nell’s ski accident. She had really damaged her knee but nothing was done for her, and that injured knee hampered the amount of mountain hiking we could actually do in 1980. We traveled on to Laax.

Some of what I have to say about the Laaxer Chemistry Conferences was covered in my Preface to a Special Issue of *Heterocycles* (39, 11 (1994)) in honor of Arnold Brossi. Nell and I attended the meetings also in 1982 and 1984 but missed the one in 1986 due to the onset of Nell’s illness in September of that year. I attended alone in 1988 and 1990 and then introduced Peggy Phelps to chemistry and the venue in 1992, after which one of the apartments was sold, with the result that Casa Fargliuns could no longer accommodate the number who had the pleasant habit of attending.

It was almost impossible to avoid inviting the same speakers to return during the period 1980-1992 because they were so happy with the surroundings, with the company, and with the seminar material that was covered each second year. Participants came from the USA (East and West Coasts and the Midwest were represented) from Switzerland, France, Japan, Belgium, Poland, and Czechoslovakia (now the Czech Republic). Because the same speakers wished to return, they had to struggle, of course, to produce something within the two-year period that was worthy of presentation to a very critical and interested audience. The speeches usually took place in the morning. When there was rain, which was not so unusual for Switzerland in September, there were also speeches in the afternoon. There were long hikes in the afternoon in both rain and sunshine. We hiked or rode to lakes and reservoirs, we walked up mountains

and saw canyons and other geological wonders, we visited the capital of Graubünden, which is Chur, and a number of villages, including one, Vargis, which is unoccupied in the winter. We also visited chemical plants in Buchs and Lugano, churches, cloisters, town markets, flower shows, and the famous Abbey Library of St. Gallen. We rode on cable cars and chair lifts. We had the most wonderful meals served in the most wonderful surroundings, either in Casa Fargliuns or in favored restaurants that had been checked out by Arnold Brossi. This meant that he knew the proprietor, knew the chef, and had discussed the meal to be served well in advance of the celebration.

Let me describe where some of the lunches were served. One was in the Duchy of Liechtenstein and a few were in Lugano, but the lunches were merely encouragements to do something energetic in the afternoon because one needed to walk off or "think off" some of the great food that had been taken in. Some of the dinners were cooked by Hanni Brossi, dinners that included Swiss specialties. In the early conferences there were a few cooperative dinners cooked by spouses who were attending the conferences, but it was hard to keep up with the Swiss cooking ability and specialties that were produced by Mrs. Brossi. In the later conferences, we felt it necessary to relieve Mrs. Brossi of some of her duties in connection with the conference, and we had gourmet dinners here and there in the valleys of Graubünden. Some gourmet banquets were held when we celebrated birthdays or awards that some of the attending members had received. There was also cheese fondue to be obtained on the mountain just behind the Brossi set of apartments. The afternoon hikes, mild climbs and descents, also involved wild mushroom gathering. Gathering of wild mushrooms is still one of Arnold Brossi's favorite recreations, and he knows his mushrooms! Fortunately, in the town of Laax, there was also a town expert on mushrooms; accordingly, one could take the gathered mushrooms to the town expert and let him decide which were poisonous, which were not very tasty, and which would be really excellent either alone or mixed in with wild pheasant or with some special dish of the evening. It has to be said that another of Arnold Brossi's specialties is understanding and appreciating Swiss wines and different cheeses from all parts of Switzerland, so that not only were these conferences chemically educational but they were gastronomically very exciting and inspiring.

You might, as a reader, be wondering whether real chemistry took place at these conferences because there were so many interesting things to do and wonderful things to eat. Indeed, chemistry was taken very seriously. We projected films, we projected slides, and we had large pads on which to write our own experiments and theories. The dining room table around which we sat had a slate top, so that one could write on the table with

chalk and afterward erase all the beautiful diagrams. One of the attendees, a very astute gentleman from the West Coast, managed to take notes at all of the lectures so that the progress of each of the attendees, especially of those who were repeaters, could be fully monitored. Nothing escaped the attention of those who had listened two years before because progress had to be made in order for a new talk to be given. We shared great science and great companionship.

The Conferences gave us other opportunities. In 1982, I gave a lecture in Zürich at the E.T.H. (invitation of Duilio Arigoni) after Laax, and we were treated to a Prelog-guided tour of the Zürich Kunsthalle. In 1984, we visited Otto and Esther Isler on the Lake of Constance before the Laax Conference and we visited family in Holland after the Conference. In 1988 and 1990, I traveled as many narrow gauge sections of the Swiss railroad system as possible and photographed the most exciting portions, as well as some model railroad installations in hotels and in the Museum of Transportation in Lucerne. I claimed that the photography of the model railroads was done for son David, who had the ambition of constructing an exhibit. From my enjoyment during this process, however, I had to conclude that I did this not only for David's delight. After all, he would get to see only the images. I was seeing the actual railroads.

## INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY, 1981-1993

IUPAC is a nongovernmental, nonprofit association of national adhering organizations, typically national chemical societies or academies of science, each of which represents the chemists of a member country. A biennial General Assembly attends to the governance of IUPAC, which sponsors about 20 conferences and workshops each year on various aspects of pure and applied chemistry. The organization is responsive to changes that occur in the science and in perceived needs, international and national, of various areas of the science. During the twelve years, the maximum term allowable, that I was associated with IUPAC, I was attached to the Organic Chemistry Division in the following roles: Titular Member of Organic Chemistry Division of the International Union of Pure and Applied Chemistry, 1981-1985; Coopted Member, 1985-1987; Secretary, Organic Chemistry Division, 1987-1989; Vice President, Organic Chemistry Division, 1989-1991; President, Organic Chemistry Division, 1991-1993.

It was all a learning experience. The year 1987 was a turning point in my acceptance of greater responsibility. I had gone to Boston in late August

to attend a meeting of the Organic Division of IUPAC, but I was suffering such unusual physical symptoms that I checked myself into Emergency at Brigham and Women's Hospital at the urging of my friend, Elkan Blout. From 4:30 p.m. until 11:30 p.m. on a fateful Friday, I was subjected to a barrage of tests until the verdict was announced: a localized adenocarcinoma in the bile duct. Elkan and a former student of mine, Graham Walker, who was a staff member in Biological Sciences at MIT, were my heroic companions at one time or another during that lengthy diagnosis period. I was released in Elkan's care over the weekend because the only physician recommended to perform the necessary surgery, a so-called Whipple Procedure, was Professor Dr. Robert Osteen of Harvard University, who was sailing on Narragansett Bay and would not be back until Monday, when I was supposed to check into the hospital again.

What does this illness have to do with IUPAC? Well, Joseph Bunnnett, a Professor of Chemistry at the University of California, Santa Barbara, who was President of the Organic Chemistry Division, IUPAC at the time, came to see me at the hospital on Monday. I had been elected Secretary for three years, he informed me, and he wanted to know whether I would be able to fill that role. I assured him that I thought I could after I recovered from the present difficulty; accordingly, he reported my election to the central administration. My answer might have been tempered somewhat if I had seen Dr. Osteen before I talked to Joe Bunnnett. During Dr. Osteen's evening visit, he described my case, the Whipple itself, and the recovery process. He gave me odds of 1:20. "Why are you telling me such dreadful odds. I don't like them. I want better," I complained. He answered that since I was scientist he could be forthright with me. After the operation, he hoped he could offer me better odds. In fact, he did when I finally awoke from a long anesthetic sleep, full of tubes and attachments: 50/50. I told Marcia, who was there, waiting for my return to existence, that I thought I could manage those odds. I was released from the hospital after five weeks with inverted odds of survival of 20:1, which were finally acceptable. After two weeks of rest and recovery with Elkan and Gail in Cambridge, aided by walks along the Charles River with professor friends from Harvard and MIT, I spent the same length of time with Tom and Marcia in Maplewood, New Jersey. Then I returned to Urbana, Illinois, to renew my old commitment to research direction and to assume my new commitment to the Organic Division of IUPAC. Recovery was declared complete when I joined the family for skiing in Snowmass over the Christmas/New Year holiday.

It took some time to become acquainted with the structure and functions of IUPAC and with the Organic Chemistry Division Committee and to discern where I could be effective in some role. Our committee

membership was truly international, there was considerable travel required to attend meetings, and there were innumerable reports to read and write. As a Committee member, I was learning; as the Secretary of the Division, I dutifully kept minutes and kept my colleagues informed; as the Vice President, I was still in training; and as the President (1991-1993), I finally saw action. It was important to define the purpose of our existence, to obtain funding to support new projects, and to insert our presence into IUPAC ventures that had an organic chemistry component. The following document gives the flavor of the operation and will indicate to you, if you read it, the scope of our mission. Some parts are interesting, especially IB, some are dull, and some are purely of professional interest. It is very likely that there are many scientific organizations, especially international ones, which have corresponding components. The compensating features are the contacts and developing friendships with scientists of other nations, the opportunity for travel, and the satisfaction of accomplishing small steps forward in the pursuit of worthy goals. One becomes a member of such an organization partly because of a self-assigned duty to the profession.

## **Organic Chemistry Division Committee, IUPAC Response to the Secretary General's Letter of January 8, 1992**

### **INTRODUCTION**

We value the stated "Guidelines for IUPAC Programmes." We support the mission-oriented programmes on (a) environmental chemistry and on (b) the chemistry of advanced materials. We ask to have a voice in appointments to committees dealing with these programmes since they will necessarily have an organic chemistry component and since we should, as the Organic Chemistry Division Committee, have close liaison with the development of these programmes. It is to be hoped that a general focus on environmental chemical issues can be achieved since we are confronting global problems. We have not yet learned how one applies for funds for projects in environmental chemistry. Nor have we been advised as to the fate of the "Guidelines for the Handling and Disposal of Toxic Substances" (the title may not now be accurate), to which we contributed and the publication of which seems to be unduly delayed.

As a Committee, we are seeking a better definition of our total purpose by involving each of the committee members in one or more aspects of our work. In the future and insofar as possible, we shall add to the usual

criteria for the selection of new members of the Committee and Commissions the ability to provide expertise for projects in which we are involved or intend to be involved.

## I. PROGRAMMES

- A. A Subcommittee on **Organic Synthesis** which was started by Irina Beletskaya during her presidency will meet during the IUPAC Conference on Organic Synthesis in Montréal, Canada, June 28-July 2, 1992, to formulate a feasibility study. We recognize the need for a programme in this core subject of organic chemistry that includes the following items; *inter alia*:
1. Provision of guidelines for obtaining information on synthesis—methods, yields, availability of chemicals, relative cost, duration of reaction, stereochemistry, disposal of reagents, etc.
  2. Computer-assisted synthesis—analysis of data packages that are commercially available. This facet is to be coordinated with Computers in Chemistry.
  3. Analysis of the optimum methods of teaching synthesis, e.g., retrosynthetic procedures. This facet is to be coordinated with the Teaching of Chemistry (see below).
  4. Provision of a means of planning biennial International Conferences on Organic Synthesis. This is a procedural matter only, but it is needed to establish continuity.
- B. An **IUPAC Task Force (Subcommittee) on Scientific Aspects of the Destruction of Chemical Warfare Agents** has been assembled by Joseph Bunnett who earlier was President of the Organic Chemistry Division Committee. It is broadly representative in nationalities, military and civilian experts, and experts in phosphorus chemistry, physical organic chemistry, photochemistry, industrial organic chemistry, and microbiology. Outside funding is being sought, with the approval of IUPAC, and the present plan calls for an initial single-day international conference, followed by a two-day workshop in early summer, 1992.
- C. Division III is concerned with the **teaching of organic chemistry** at college levels in various countries, and two representatives have agreed to meet with two from the Committee on the Teaching of Chemistry at the General Assembly in Lisbon, 1993. There will be joint discussion of the problems, methods of finding solutions, and actions that can be taken. We will introduce for consideration our

idea that the teaching of organic chemistry should be innovative not only for developing countries but for the most advanced of the chemical communities.

- D. The Second IUPAC Symposium on **Bioorganic Chemistry** will be held in Fukuoka, Japan, in June, 1993. The occasion will be used to provide for continuity of these conferences and to decide how to forge a better link to biotechnology and molecular biology on the basis of the logic and experience of organic chemistry.

## II. COMMISSIONS

The Organic Chemistry Division has only three Commissions at the present time. Their activities are subject to constant scrutiny internally by the Organic Division Committee and by external referees.

**Commission III.I.** Commission on Nomenclature of Organic Chemistry (CNOc). With the emergence of computerized nomenclature, the new role for CNOc becomes obvious.

*Section P.* This section is in charge of producing preferred (P) names. It includes *ipso facto* everyone associated with CNOc and operates in close cooperation with the Beilstein Institute and the Chemical Abstracts Service. The work of this section should be completed within the next five years. For the present and future, the P name will be determined as soon as possible and fed into the computer system.

*Computerized Nomenclature.* CNOc has created an Overview Committee on Computer-Nomenclature Interface with the purpose of developing (or collaborating in the development of) computer software for formula-name and name-formula conversions. The presently defined roles of the *ad hoc* committee include:

- i) Compilation and review of all existing programmes dealing with organic nomenclature.
- ii) Establishment of links with the Commission on Nomenclature of Inorganic Chemistry (CNIC) for computerized nomenclature of organometallic compounds (see below) and with other Commissions and Committees dealing with nomenclature.
- iii) Assistance and counseling of all those working in computer sciences, information sciences, and communications who deal with topics related to organic nomenclature and notations.

*Organometallic Nomenclature.* Actively pursued with CNIC, especially the development of P names.

*Theoretical Approach to Nomenclature.* In order to meet future needs, it is desirable to develop further a theory of nomenclature that will serve as a sound base. With the advent of modern word-processing technology, both chemical structures as a means of language and linear notations are feasible.

**Commission III.2.** Commission on Physical Organic Chemistry. The following tasks were accomplished recently:

- i) Guidelines for the presentation of quantum mechanical computational data in organic chemistry: started 1986, completed 1990, submitted to IDCNS.
- ii) Guidelines for the publication of research in experimental organic chemistry: started 1985, completed 1990/1991, submitted to IDCNS.

The following are in progress:

- iii) Glossary of terms used in physical organic chemistry: will be completed in 1992/1993.
- iv) Structure-reactivity parameters and relationships: started 1990.
- v) Modeling: feasibility study started 1991. It will probably require broad collaboration.

**Commission III.3.** Photochemistry Commission. The projects are always interdisciplinary, covering organic, physical, inorganic, biological, and environmental facets of the subject of photochemistry. The Commission uses a "working party" approach with agreed-upon priorities and limited lifetimes. Tasks of 111.3 include the following:

- i) Education in photochemistry—a set of simple experiments that teach photochemical principles: publication is in press.
- ii) Complementary to the recent fluorescence project, an electron transfer glossary is in final revision.
- iii) Photocatalysis in environmental waste treatment, which has been encouraged as a cross-disciplinary effort by IUPAC letters received, is undergoing a feasibility study.

Commission III.3 sees the need for a closer interface with industry, where photochemistry plays a role from nonlinear optical materials to bioactive compounds.

Much of the work of Commission III.1 and possibly of Commission III.2 could be done outside the General Assembly format of meetings,

perhaps at special interest symposia or conferences sponsored by IUPAC. Ratification of the work would then be done at General Assemblies with the Commission Chairmen and Secretaries present.

The Organic Chemistry Division Committee plans to continue monitoring as closely as possible the continuation of these three Commissions, the ordering of priorities, and the completion of tasks. A mechanism has been set in place for the Committee president plus one Committee member, who acts as liaison, to enter into the publication phase at the referring stage rather than delaying to a later stage. This will save time in the completion of the commissions' tasks. It is also more consistent with annual rather than biennial review. As mentioned earlier, new members on the Commissions will be selected, *inter alia*, by fields of expertise.

### III. FUTURE

Individual Committee members have suggested some ideas for future consideration by IUPAC officers and Bureau. These ideas are part of a "wish list" that is more "total" IUPAC than Organic Division alone:

1. Establishment of an International Fund of the Chemical Industry. This would be parallel to the Fund (Fond) which is provided in Germany by German industry. Its role would be to fund research projects, personnel, prizes (the Thieme-IUPAC Award in Organic Synthesis is a "first"), travel, meetings, etc., on an international scale.
2. Chemistry movies for television. One should ascertain what educational films already exist.
3. Global agreement on academic credentials, including recognition of what degrees are equivalent, country to country.

\* \* \*

While I was president of the Organic Chemistry Division, the following countries were represented on the Committee: Canada, Germany, Italy, Japan, the Netherlands, Poland, Russia, Switzerland, and, of course, the United States of America. Additional countries had been represented during the years preceding 1991-1993, including Australia, Brazil, Denmark, France, India, Spain, Sweden, and the United Kingdom. For a Committee composed of many different national representatives to function smoothly and to follow an agenda in an orderly manner, it requires strong but diplomatic direction, interjection of humor that must be understood by all, and social occasions to soften any brusqueness that is generated during the formal meetings. The Chairman

of the international committee must forget his/her own ego in allowing full play of each national representative's ego and feeling of pride, at the same time keeping the common purpose in focus. The difficulties of guiding a coherent committee are simply multiplied by the number of nations represented. As a counterweight, the satisfaction of reaching consensus or even majority opinion is great, and the pleasure in moving forward effectively extends to all the members.

I am sure my individual experience has been exemplified and studied in the consideration of many other international organizations and how they operate. During my tenure, I had to deal with additional problems that were challenges. When the full committee lost focus, I had to appoint a subcommittee. When the Secretary once reported his own divergent opinion to the next higher administrative level as though it were the conclusion of the majority, I had to intervene to point out that we felt it important that a minority opinion should be represented and that the Secretary had done so on our behalf; however, the contrasting majority opinion was thus and so. Repair of a situation was occasionally necessary when the Committee-member organizer of a symposium had failed to notify the invited speakers of the IUPAC requirement that manuscripts of the plenary and invited lectures would be required for publication in IUPAC's *Pure and Applied Chemistry*, threatening the loss of budgetary appropriation. One member of our international committee kept us on edge by asking (frequently) the purpose of our existence. I finally proposed him for Vice President so that he would have to do some constructive thinking and work in anticipation of becoming President. The ploy was only moderately successful. One committee-appointed symposium organizer failed to plan his meeting, with the result that the Organic Chemistry Division lost the chance to present the general subject matter for four years, eight years beyond the first IUPAC symposium in that field. It is difficult to assert the importance of a field, in this case Bioorganic Chemistry, that has only to be reviewed every eight years. New science moves faster than that. The situation was rescued through the efforts of one of our committee members, Professor Michinori Ōki, who caused the second IUPAC symposium on the subject to be staged by his colleagues in Japan, thus establishing, or re-establishing, continuity.

The biennial reports of each Division of IUPAC were reported by the individual Presidents to the governing Bureau. Most of the reports were read from manuscripts that became available anyway. I decided to be different. After practicing my report on the activities of the Organic Chemistry Division in outline form, I presented it without notes and with strong emphasis of the importance of the IUPAC Task Force, a Subcommittee, on Scientific Aspects of the Destruction of Chemical

Warfare Agents. I stressed that information had to be exchanged internationally on the best and most harmless method of destruction of the agents and the weapons. The immediate, pleasant result was that some funding was made available from an unexpected source, a representative at the Bureau meeting who had reacted to my plea. Two international conferences were held dealing with the subject, but I have no information as to the continuation of the exchanges of information. The subject is still of crucial importance and more especially because of the terrorist activity experienced and recognized as chronic in 2001.

One of our Commissions, III.1, on Nomenclature of Organic Compounds, seemed to want to meet together long after the tenure period of some of their members had elapsed. The experts enjoyed each other's company and made nomenclature a way of life, or at least of their purpose in life. I had to enforce the tenure limits, and they wanted their retired members, admittedly experts after years of experience, to be present at their meetings. A compromise was reached. I would provide expense funds for the exact number of active members on the Commission; they could divide the total available in any amicable way among their members by cash transfers. Reorganization of IUPAC, which is a chronic phenomenon, and computerized nomenclature methodology, which changes and improves each year, have by now altered the decades-old method of doing things.

Important matters sometimes took so long to pass through the many layers of discussion and administration that those involved in originating the idea lost hope, were bypassed, or were simply forgotten. The following exchange of letters on laboratory safety will illustrate the point. I am writing to Mo Williams, the Executive Secretary of IUPAC (February 1, 1994):

*"I find your FAX of January 21, 1994 a bit mystifying: no word about Chemical Safety Matters being useful in fulfilling the request in your circular letter of December 3, 1993.*

*"I refer now to the Editorial Group and the Preface to this volume. Members McKusick and Joyce were the originators of the two volumes published by the U.S. National Academy of Sciences/National Research Council. Acting for and on the instructions of the Organic Chemistry Division of IUPAC, I first convinced the President and Treasurer of the N.A.S. that they should release the two volumes, copyright-free, to I.U.P.A.C. Then, I worked on the American IUPAC Committee to take up the mission of getting IUPAC to start their work at least with the recognition that these two volumes, suitably modified, could form a basis for the final work. Throughout the very long process I was in touch with Blaine McKusick every several months to offer encouragement and influence. I think I was a breaker-of-log-jams.*

## MORE THAN A MEMOIR

*acting first as Secretary, then Vice President, then President of the Organic Chemistry Division Committee. That is why I judged that we had something to do with the final product. McKusick and Joyce, the originators, are organic chemists. Their activities were "blessed" by the Committee at every stage. The Committee itself had to do no work. Many others did, as the Preface shows, and we are grateful."*

His reply to me:

*"From the background of the second paragraph of your fax letter to me on 1<sup>st</sup> February 1994, things are now much clearer to me! I was unaware that you were personally responsible some ten years ago for ensuring that the two volumes published by US National Academy of Sciences/National Research Council were sent to IUPAC, leading eventually to publication in 1992 of the book Chemical Safety Matters.*

*"Please accept my apology for writing somewhat hastily to you on 21 January."*

The pleasant experiences of my 12 years with IUPAC included becoming acquainted and making friends with chemists from many different countries and traveling to foreign countries with some time allowed for sightseeing. The countries and cities visited included the following: Canada (Montreal), Denmark (Copenhagen), England (Oxford), Finland (Helsinki), France (Lyon), Germany (Hamburg), Japan (Fukuoka and Tokyo), the Netherlands (The Hague), and Portugal (Lisbon). It is strange how quickly one forgets all the systems of procedure relating to appointments, symposium and meeting arrangements, budget, and grant requests. The real test of my relationship to IUPAC was whether I was more optimistic when I left the organization than when I first became active in its operation. Apparently I was more optimistic, as indicated in this letter of September 7, 1993, that I wrote to my successor officers, Michinori Ōki of Japan and Gianfranco Scorrano of Italy:

*Dear Michi and Gianfranco:*

*As I end my work in the Organic Chemistry Division (December 31, 1993), I look back on a total of 12 years of service, and I want to convey my urging for you to be optimistic in your new offices of President and Vice President. You can look upon yourselves as companion rudders of a 1000-foot tanker. It looks as though you are not moving the steering mechanism very much, but eventually the long ship (IUPAC) starts altering course. In spite of frustrations and*

*questions, self-doubt and self-criticism, we can look back at the last package of years with some satisfaction in considering what we have accomplished. At the same time, you will have to work hard to make sure that the changes of direction we have caused are not lost! Below are some of the things we have accomplished.*

*A) We have instituted new programs through Sub-Committee appointments:*

*Organic Synthesis (TM members are Stang, Winterfeldt, and Richer; and there is the possibility of one more TM if our application to the Executive Committee is approved). In a feasibility study of two years, it may be concluded that a Commission is necessary. Regular reports of progress are to be encouraged.*

*Bioorganic Chemistry (Pandit a TM, Norin a CM, NJL an Associate Member; other Associate Members to be appointed). In a feasibility study of two years, it may be concluded that a Commission is necessary. Regular reports of progress are to be encouraged. The Physical Chemistry Division seems somewhat aggressive about including Bioorganic Chemistry with their intended Commission on Biophysical Chemistry. Although cooperation is certainly indicated, especially through our Commission on Physical Organic Chemistry, I believe our Bioorganic effort ought not to be engulfed in someone else's operation. The Bioorganic Chemistry Symposia series has been reinstated.*

*Scientific Aspects of the Destruction of Chemical Warfare Agents (J. Bunnett, Chairman). After hearing my report in the Council, Treasurer John Ward met with three Division presidents in the Bureau, and they decided to give us some money from their Environmental Fund (one-third of what they have available). The promised \$2,000 will be used to pay travel costs of Russian and Polish members of the Sub-Committee to attend a meeting or meetings. I shall let you and Joe Bunnett know when the money comes through.*

*B) We have found a way to increase our funds by subventions from surplus at our sponsored International Symposia (the Richer-Young method of budget enhancement). The budgeted amount of 2000 USD plus the Montréal gift of 2000 Can D will put the Organic Synthesis Sub-Committee in motion in 1994. It would be helpful if some surplus amount from the Fukuoka Symposium in Bioorganic Chemistry could be obtained for us to help initiate the planning*

*of the Russian Symposium in 1996. The Organic Division Sub-Committee has been asked to identify possible sources of funding (in USD) to help the Russians get started.*

- C) *Chemistry International. This magazine has been improved, and we may have had a role in the process. We should continue to seek publicity there. My invited "Hot-Spots in Organic Chemistry" will appear in the September issue.*
- D) *Pure and Applied Chemistry. The inclusion of plenary and invited lectures in the publication of Symposia and Conference material has improved the content of that magazine and has provided total surveys of a field in one place. At the Council Meeting, I suggested that the inclusion of introductory remarks to summarize a field or area and to appear before the plenary and invited lectures would constitute a quotable highlighting of the area. I have done just this by providing a manuscript of my introductory lecture at the Fukuoka Bioorganic Chemistry Symposium.*
- E) *Commissions.*

*Commission, CNOC, III.1 was very slow in the past. The present concentration on computerized nomenclature is their most important activity. Joint consideration with CNIC of organometallic chemical nomenclature (computer compatible) is an important project.*

*Commission III.2's approved ongoing projects are under consideration by the Secretariat, as are those of III.1.*

*Commission III.3's 14 photochemical experiments published in PAC are especially praiseworthy since they exemplify principles, use simple apparatus, and provide lead references and are therefore of universal use.*

*Good liaison with the Commissions must be continued.*

- F) *Conferences. I am very comfortable with the four criteria we have devised for granting Organic Division Sponsorship of International Conferences and symposia. Dr. Gujral is now sending these automatically to anyone who asks for an A.I.Q. form.*
- G) *OCD Committee. I am pleased that we have a very active Committee, each of whom now has responsibility for some function or functions. It is important to have competency and breadth in our electees so we can be flexible and put our ideas to work quickly, without necessitating the formation of some new formal structure.*

NELSON J. LEONARD

*These are some of my thoughts. I see every reason for you to be optimistic, but I found that one has to initiate or innovate. Whatever "structure" or "restructure" you have to work under can really accommodate your best intentions and efforts.*

*Good luck and best wishes.*

*Sincerely yours,*

*Nelson J. Leonard  
President, 1991-1993*

## **AMERICAN ACADEMY OF ARTS AND SCIENCES, 1987-1993**

The American Academy of Arts and Sciences was founded during the American Revolution by intellectual leaders of the new nation. John Adams, later to become the second President of the United States, initiated the chain of events that led to the formation of the Academy. The charter of the organization included the purpose of the Institution:

“... to promote and encourage the knowledge of the antiquities of America, and of the natural history of the country, and to determine the uses to which the various natural productions of the country may be applied; to promote and encourage medical discoveries; mathematical disquisitions; philosophical inquiries and experiments; astronomical, meteorological, and geographical observations; and improvements in agriculture, arts, manufactures, and commerce; and, in fine, to cultivate every art and science which may tend to advance the interest, honor, dignity, and happiness of a free, independent, and virtuous people.”

I was elected a Fellow in 1961, but I was a passive member until I was placed on the Council of the Midwest Center, close to the time that geographic centers were created in addition to the Academy's home in Cambridge, Massachusetts. I succeeded my friend Steve Berry as Chairman of the Midwest Center (1990-1993). That position carried with it additional responsibilities of membership on the Executive Committee and Vice President of the AAAS. Regular meetings in the Chicago area

and in Cambridge allowed me to see old friends at the same time that I learned of and supported the substantial activities of both the Midwest Center and the parent body.

One of the important projects that was completed during my time of service was "The Fundamentalism Project" at the University of Chicago, which resulted in the publication of a series of volumes dealing with all aspects of fundamentalism plus a summary volume, all on the subjects of Christianity, Judaism, Islam, South Asian religions, and East Asian religions. A cross-cultural comparative analysis was included as to when and under what conditions radical fundamentalism leads to aggression and when sympathizers become participants in conflict. These are world problems at the present time.

Another University of Chicago project that had momentum and to which the Midwest Center contributed was a symposium organized by Professor John A. Simpson of the Department of Physics in connection with the University of Chicago Centennial. The Symposium on "Preservation of Near-Earth Space for Future Generations" brought to the attention of all present and future space-faring nations the developing threat of space debris to the long-term pursuit of scientific, technological, industrial, and national security activities in space. Professor Simpson proposed that the symposium, with international invitees, would lay the groundwork for an International Treaty for the Preservation of the Integrity of Space. We were not at a loss to address significant issues, were we?

A workshop was organized to formulate research proposals relating to "Climate Changes and Global Security." We were also part of the Midwest Consortium for International Security Studies (MCISS) which was dealing with the problems of maintaining security among the nations. Closer to our professional expertise was a project spearheaded by Steve Beery on "The Future of Research Libraries." In this title, the "future" was intended to mean 10-20 years, and it is already upon us. After studying and drafting a proposal for funding, the Steering Committee focused on several projects that were representative, examining and assessing the computer infrastructure and its use in enhancing scholars' access to information. The problem is current in every research library in the country.

Another problem that remains with us but is of global import is the unsettled and unsettling situation in the Middle East. One of our members raised the question as to what our Midwest Center of the AAAS might be able to do to improve the situation. What indeed could a Midwest-U.S. scholarly group hope to accomplish to this purpose? Arnold Zellner of the

University of Chicago proposed a study of the potential social and economic benefits of a Middle East Common Market (MECM). The suggestion was that if greater prosperity could be brought to the region, the conflicts might be decreased. The idea had been raised before but had not received systematic study. As envisaged by Zellner, the study would focus on economic analysis and turn to cultural and religious issues as these questions arose. Using simulation models developed by the Battelle Institute, it would be possible to make projections for the region with and without a common market. He suggested that the Battelle Institute might be interested in working on the project and, in this case, initial funding needs would be minimal. There is a data base on world trade, and analytic studies of the impact of the Common Market on Europe could be used to model the study. The Midwest Council, at my urging, agreed unanimously to help organize the project, with full appreciation of the political impediments to its realization. We requested funds from our Cambridge parent to lay the groundwork and explore the development of a comprehensive study of an MECM. Alas, conflicts at every level in the Middle East have overtaken the initial goal and submerged it. Can the goal ever be revived in the wake of seemingly endless and unresolvable wars, ethnic and religious strife, terrorism, dictatorship, religious fundamentalists, and extremism? Even if an MECM could be set up, would some faction try to demolish it? My term as Chairman of the Midwest Center ended before progress on this particular study could be realized, and progress in all our activities was interrupted shortly thereafter by the untimely death of our Executive Director, Dr. Marian Rice.

On a more positive note, I instituted a practice—I do not know whether it has been continued—of convening the University of Illinois Fellows of the American Academy of Arts and Sciences once or twice a year for a social occasion and to listen to a talk covering a topic of scholarship or research that would inform and could excite interest and general discussion. The initial, catered dinner meeting of resident fellows was held at my house in Urbana on Thursday, February 21, 1991. Ladislav Zgusta, Professor of Linguistics and Classics and Director of the Center for Advanced Study, presented an after-dinner talk on “Lost Language Recovered,” with handouts. The 24 fellows and guests who attended were enthusiastic about the experience, especially since the American Academy had been for them, until that time, a rather amorphous body in distant Cambridge, Mass. During the period that I was Chairman of the Midwest Center, we were able to increase the number of worthy fellows elected from the Midwest and particularly from the University of Illinois at Urbana-Champaign.

## HONORARY DEGREES

## 1963—Lehigh University, Bethlehem, Pennsylvania

I had not kept up very well with my alma mater, Lehigh University, from the time that I was graduated in 1937 until 1963; accordingly, it came as a surprise to me when I received word from President Harvey Neville that the University intended to award me an honorary Sc.D. degree at a convocation to be held in October of 1963. It is true that I had returned to the campus to visit with selected faculty, the soccer coach, and friends in town twice between 1939 and 1942, and Nell, Kenneth (age 8 months) and I had driven through the snow-covered campus on our way to Mount Vernon, New York, for a Christmas vacation with my parents in 1948, but I had not attended any alumni functions or even football games. Harvey Neville had been a chemistry professor before he assumed administrative duties. He had been following my career in chemistry and must have recognized that some of the milestones I had passed were unique for a Lehigh graduate, such as election to the National Academy of Sciences (1955) and the American Academy of Arts and Sciences (1961) and receipt of the American Chemical Society Award for Creative Work in Synthetic Organic Chemistry (1953). I was delighted, of course! It would be a new experience and would provide an opportunity to see the Lehigh campus in its early fall colors. There was, however, a hooker. I was invited to give the convocation address. The two items were by tradition inseparable.

Nell and I had a small but enthusiastic cast supporting us at the convocation: my cousin Virginia and her husband Stewart Rote represented the family, my long-time mentor Morton Sultzer was a member of the Board of Trustees, Robert Billinger was an admired Professor of Chemistry whom I had had in class during my freshman year, and Al Rights had directed the plays and musicals in which I participated. There were other professors who claimed to have had a hand in my undergraduate education, and I was pleased to acknowledge them and to walk with them in the academic procession. I have always felt that it is important to live the moment, to savor the surroundings, to sense a moment like that with *all* the senses and not to let it slip away. It is not important to photograph the event except in the mind. It is wasteful to allow the concentration to drift during the experience. It is important to be part of the event, any meaningful event. It represents a portion of our conscious life.

What about the lecture? I was not very satisfied with it. The responsibility came at a stressful time when I did not have the hours

necessary to corral original thoughts. I relied heavily upon quotations from famous astronomers, physicists, and chemists to support the theme, something along the lines of “all this universe, so much to discover.” I liked the quotations. I liked the theme, but I believe I failed to convince many in the Chapel that day of the exciting scientific discoveries that lie beyond the horizons. I have not included the talk in the appendix because it was not sufficiently my own. Nevertheless, the day was not spoiled. I had the confirmatory degree and the storable Lehigh hood, along with the subjective replenishment of a four-year devotion to education.

### **1980—Adam Mickiewicz University, Poznań, Poland**

Adam Mickiewicz is the most revered of the poets of Poland, and the University of Poznań is named after him. I learned in May of 1980 from Kris Golankiewicz, my former postdoctorate at Illinois and now the Deputy Rector of UAM, as it is abbreviated, that the University Senate wished to award me an honorary degree. A recent perusal of some correspondence for the period between May and September of 1980 indicates concern about dates and worry about the public (not research) address I would have to give on the occasion. Arrangements were finally made for us to fly to Warsaw from Zürich on September 27 after the Laaxer Conference and for us to depart Warsaw on October 2 on separate flights, Nell to Copenhagen and Amsterdam, and I to Zürich, Chicago and Champaign-Urbana. I was warned that my response to Kris's promotion speech, which turned out to be lengthy, should be only twenty minutes in length and would not have the benefit of blackboard or projection facilities. These are difficult parameters for a chemist, who usually relies heavily on visual props. I offered the opportunity of presenting a chemistry seminar on another day, just for the chemists in Poznań, and that seemed acceptable (my recent talk in Laax).

Our visit this time in Poland was a very festive one, and we received warm hospitality. Kris and Bozenna met us in Warsaw, where we stayed overnight, and drove us to Poznań the next day, with a stop along the way at the home where Chopin had lived. On the return journey to Warsaw, we also went by car and stayed the night before flying home. Events of the three days in-between, which were very well planned, included a fine dinner at the apartment of the Golankiewiczzes together with their two children. The formal degree ceremony was quite spectacular, mainly because of the robes, hats, and long velvet gloves worn by the professors and administrators who participated. I wore a normal U.S. cap and gown and a Columbia Ph.D. hood, all of which I had rented from the University

of Illinois. We marched into the small auditorium behind suitably carried symbols of the UAM and of Rectorial authority. It all looked very medieval.

The Rector, Benon Miskiewicz (with a name similar to that of the University) announced the purpose of the convocation, then Kris gave his long speech in Polish concerning the chemistry and personality of the awardee. It was all pretty serious stuff. I was waiting for a few laughs, but all that was engendered was a smile now and then. In October, I received an English translation of the talk, and I find it very thorough. After Kris's promotion, I gave a shorter "graduation" speech in English. Let me resurrect parts of it that still seem worthwhile. I started with, "It may be one of the requirements for this honorary degree to be able to speak in a foreign language, and today I choose English." I mentioned my great pleasure in working closely with five Polish scientists: Dr. Alicia Szweykowska and Dr. Olga Rogozinska in the laboratory of my research collaborator, the eminent plant physiologist, Folke Skoog, and three organic chemists, Dr. Selim Achmatowicz, Professor Kryztof Golankiewicz, UAM's Deputy Rector, and Dr. Bożenna Golankiewicz, in my laboratory at the University of Illinois. I spoke of my parallel research with that of Dr. Maciej Wiewiórowski of the Polish Academy of Sciences in lupin alkaloids and nucleic acid chemistry. I also recalled the tradition of Polish chemists and biochemists, particularly Stainslaw Kostanecki, on the theory of colored substances, Marcei Nencki, who isolated heme from hemoglobin, and Kazimierz Fünk, who isolated and named Vitamin B<sub>1</sub>. My thesis was the unexpected course of well-planned research, or what lessons can be learned in the "normal" pursuit of research in organic chemistry. I detailed the importance of careful observations, acceptance of new facts, revision of original concepts to accommodate the new facts, and then retesting to gather further evidence. I had always been surprised by the unexpected turns in my research. With this experience in mind, I obtained additional support for the thesis when I asked ten of my contemporaries for their reactions. All had responded quickly, although they were busy scientists, personally, and in some detail, and I could quote from their replies.

I concluded with "In a research team, it is the young colleagues—students, assistants, and postdoctorates—who are most likely to make careful observations that switch on new research programs, help change an embryo plan to a new concept, and change unplanned failure to unpredicted and often spectacular success. Finally, to obtain an honorary degree, one must also be an honorary student, and I like that very much."

Kris read the long Latin inscription on the huge diploma that the Rector then presented to me, along with two copies! The original sits in my office at home within a tall, red container in the shape of an architectural

column, to which is attached a large silver emblem. I also received a large blue plate with UAM inscription as a remembrance of our visit and the degree ceremony. It was remarkable that all of the booty arrived safely in Urbana.

### 1988—University of Illinois, Urbana-Champaign

In December of 1987, following my full recovery from cancer surgery in September, I received a welcome letter from Morton W. Weir, who was serving as interim Chancellor of the University of Illinois at Urbana-Champaign. The formal letter invited me to accept an honorary degree of Doctor of Science from the University of Illinois. To the letter was attached a personal note from Mort Weir, "It is a special honor, privilege, and treat for me to send this letter to you." What a joy for me! What a delightful compensation for 44 years of "service" doing just what I wanted to do. I judge that Harry Drickhamer played a pivotal role in this honorary degree process because he was a member of the Illinois Senate Committee that dealt with the subject at that time. In January, I learned that the University Board of Trustees had approved the recommendation of the campus Senate. The formal letter was superseded by a note from Mort Weir, "I think it's great! Congratulations and best wishes!" I was able to inform the children as to the award and the date of it, May 22, and to receive the gratifying response that they all wanted to celebrate the occasion with me. When I learned how many guest tickets I could obtain, I also provided two tickets for the Drickamers and two tickets for Patti Silver, who had been my secretary and my right hand for many years, the last two of which were very difficult.

Harry Drickamer, the great chemist, physicist, and chemical engineer, Ladislav Zgusta, the great linguist and I had served as a committee, with myself as convener and chairman, to consider methods of honoring outstanding faculty at Illinois, both senior and junior types, and thereby helping to retain them at Illinois. We needed only one luncheon meeting to come to consensus on a broad plan. We recommended that there be brought into existence special professorships and Center-for-Advanced-Study term professorships for the seniors plus annual research awards for the most promising of the junior faculty. The details were and are not too important because Chancellor Weir himself, it turned out, was in the process of creating a similar construct for honoring, for remuneration, and hopefully for retention of the very best and most productive of the faculty, independent of field. It was the successful merging of these plans from faculty and from administration that may have helped convince Mort Weir

of my worthiness to receive the honorary degree. We have worked in harmony together on other productive committees, and he would also have had an idea about my teaching and professional work from the formal nomination. In any case, I was especially appreciative of the honorary degree because it is unusual for such a degree to be awarded to a faculty member by his or her home institution.

An informal reception for the honorary degree recipients was held in the garden of the President's house on May 21, 1988, the night before the degree convocation. I was given about five minutes for an informal talk. The other honorary degree recipients on Sunday morning, May 22, were Dr. Ruth M. Lewis, an anthropologist, Doctor of Humane Letters, and George Will, an Urbana native, nationally syndicated columnist and political commentator, Doctor of Letters. George Will gave the commencement address. After the big day, President Stanley Ikenberry, with whom I had toured the People's Republic of China in the Spring of 1984, wrote me, "It was a personal delight to participate in the ceremonies awarding you the well-deserved honorary degree . . . It was a pleasure and a day I will long remember . . ." I replied, thanking him for his letter confirming "that he enjoyed giving me the honorary degree almost as much as I enjoyed receiving it," and further, "I have sent copies of the letter to the four children so that their spouses will have some palpable evidence of the warmth of the atmosphere prevailing on May 21, 22." Peggy Phelps and I entertained the Ikenberrys at brunch in our hotel in Washington, D.C., in April, 1997, and Stanley and I congratulated ourselves once again on having derived such pleasure from a commencement nine years earlier.

### 1983—D. Sc. Degree, University of Oxford

In January of 1983, we were making plans to attend the Reunion of Rhodes Scholars in Oxford scheduled for June of that year. In addition to a fascinating social program, one session was to coincide with the awarding of University degrees in the Sheldonian Theater. All Rhodes Scholars were alerted to the possibility that, if they had qualified for degrees, the supplication process, as it is called in the University of Oxford, might be accelerated during the first six months of 1983 so that the earned degrees could actually be awarded at the time of the Reunion. This was worth thinking about! It had always caused me pain that I had not been able to complete the D. Phil. degree due to the onset of the war in 1939. It was one of the few things I had not finished in my life. Was there now an opportunity to obtain a Doctor's Degree from Oxford?

A D. Phil. would have required research done with my own hands and further Oxford residence. Not a chance. By contrast, the requirements for a D. Sc. had changed. An acquaintance of mine in chemistry, Professor Kevin T. Potts of Rensselaer Polytechnic Institute, was helpful in describing the new requirements for me when I followed up on the announcement of his receiving a D. Sc. degree on top of an earlier Oxford degree. Here they are. One had to have a B. Sc. from Oxford, which I received in absentia in 1940 and which is the equivalent of an M.S. degree in the United States. One had to (1) supplicate through one's own college, Lincoln College in my case, (2) pay a fee, and (3) submit evidence of scholarly work done since the earlier degree. The form-filling and check-writing requirements (1) and (2) were easily met, and Patricia Denmark, who was my secretary at the time, assembled about 20 years of reprints of my publications, added a table of contents, and bound the volumes for shipping to England. I kept the operation secret from Nell because success was not guaranteed. When I learned that it had been successful, I decided to maintain the secrecy because of the pleasant surprise element that might be extracted from the degree ceremony. The actual experience was not that straightforward, but it makes a good story. Here is what happened.

On the night before the degree convocation, Nell was lying in bed reading in the student room that we occupied in Turl Street. We were in the recently refurbished section of Lincoln College that had been recovered from the Mitre Hotel when the hotel's 500-year lease (!) on the property had expired. I mentioned that on the following day we could attend the degree convocation in the Sheldonian Theater and that she would find the medieval ceremony unusual and entertaining. I was not prepared for her answer. The conversation went something like this:

"Dear, I'm tired. We've been to a church service in the Christ Church Cathedral, to receptions, to dinners, to teas—in college and in the Rhodes House/Wadham gardens (where I talked with the Queen), and I have already seen and admired the Sheldonian since its cleaning. I'd rather not go."

"You don't understand, Nell. The ceremony will be conducted in Latin. You will be able to hear Latin pronounced properly, not the way it is mispronounced in Holland."

"Don't be silly. No one knows how Latin was really pronounced centuries ago."

"But the ceremony will be colorful. The robes will be spectacular."

"My knee hurts."

I was getting desperate. My surprise was not going to work. I reached into my suitcase and pulled out a white bow tie that I had secreted there. "What's this?"

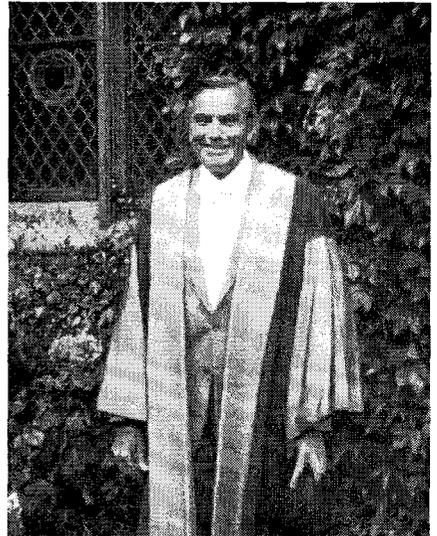
"It's a white tic."

"But we are only going to black-tie affairs. What's its purpose?"

I had almost lost it! "Well, at the University of Oxford, they have an unusual dress code for the recipients of degrees: white bow tie, white shirt, dark trousers, and black shoes, all worn under the academic gown."

"Well, you're not getting a degree, are you?" I was silent. It was a moment to savor. "Are you?" Her eyes and mouth went wide open. "Oh, of course I'll have to go!"

It was not that easy. I had not bought one ticket to the convocation because I felt that would give away the secret since Nell had been co-custodian of the reunion tickets. On the day of the convocation, there were no tickets to be had, but she said, "Leave it up to me. I'll be there." She went off in the direction of the Sheldonian, and I went to the office of the chaplain of Lincoln College, to be briefed on the procedure: "Don't even think about it! Just do what someone whispers in your ear to do at every stage. It will be disastrous if you try to think about what you should do next!" My experience went like this. A college



NJL, Oxford D. Sc., 1983

servant ("scout") accompanied me to the Sheldonian Theater, helped me into a bachelor's gown, and placed me in proper order in the procession as it filed into the building. We were all supplicants for degrees. We paraded into the Theater, were presented in batches to the Chancellor, Vice Chancellor, and suitable officials, and received some encouraging Latin phrases that few of us understood but all of us appreciated. We were making progress. We paraded out of the Theater, and I made my way to a room in the building next door, where my scout told me that he would wait for me ("Don't even think about it"). He exchanged the bachelor's gown for the D. Sc. gown that I had rented for the occasion. The D. Sc. gown is a handsome crimson and gray creation, which I enjoyed wearing in the procession as we returned to the Theater. On second pass-through we received congratulatory

phrases in Latin and a Vice-Chancellorian handshake. We were ushered to reserved seats according to our degrees and received smiles and brief head-bows from the recipients of even higher (e.g., honorary) degrees.

I could see not only that Nell had managed to attend the ceremony but that she had secured a seat that gave her great visual advantage. When it came time for photographs following the convocation, she told me that she had thrown herself on the mercy of the custodian in charge of tickets, along the lines of "My husband is receiving a D. Sc. degree today, but I don't have a ticket because he was trying to keep it a surprise for me until the event itself. He assumed there would be a sufficient number of tickets available so that I wouldn't have any problem in obtaining one at the last moment." The custodian (female) was sympathetic and escorted her into the Theater, depositing Nell in the best seat in the house, muttering something that sounded like "Husbands!" As the procession was coming in for the second time (Nell's story now), the gentleman next to her asked whether she would mind changing places with him so that he could have a better view of his daughter, who was marching in for a degree. Nell refused politely (I am sure), saying that she would like to retain her advantageous position so as to see her husband, who would also be marching in for a degree. The final exchange of remarks may be apocryphal, but according to Nell, her companion said, "Look, who is that handsome man in the crimson gown just coming in?" "Why, that's my husband." Congratulations all around.

## **SYMPOSIA AS AN IMPORTANT PART OF PROFESSIONAL LIFE**

**Conference on Current Problems in Organic Research;  
Stanford University, Aug. 30—Sept. 2, 1948**

This timely conference was organized by Professor Carl Noller so that the younger organic chemists of the United States who had been working on their own original research only since the termination of the second World War would have the opportunity of meeting each other and hearing about each other's work. For me, the Conference was of exceptional value because of long-lasting friendships that developed from the first meetings in 1948 and because of the opportunity of placing my own research ideas in the context of the studies and the goals described by the other speakers and attendees. I learned what was considered important and most likely what would become important in the future. I learned about new methodology and new theoretical approaches, and I picked up valuable

ideas about slide presentation of research material. There were eight symposium speakers: Melvin Calvin, University of California, Berkeley; Saul Winstein, University of California, Los Angeles; Ernest Campaigne, Indiana University; Herbert C. Brown, Purdue University; Thomas S. Oakwood, Pennsylvania State (then) College; Robert B. Woodward, Harvard University; Sidney M. Cantor, American Sugar Refining Co.; and myself, University of Illinois. Three of these, Calvin, Brown and Woodward, were later to receive Nobel prizes, and one probable recipient died before he might have qualified. Donald J. Cram of UCLA, whom I met at Stanford for the first time, was also destined to receive a Nobel prize. Some of the attendees were already friends, e.g., Stanley Cristol of Colorado, Joseph Kaplan of Argonne National Laboratory, Marvin Carmack of the University of Pennsylvania, Robert Baker of Northwestern, and Norman Cromwell of Nebraska. The venerable Howard Lucas of Caltech was present, and Stanford staff members Harry Mosher and William Bonner were especially hospitable.

Calvin described the mechanisms of organic reactions as indicated by the use of isotopes, both heavy and radioactive. Winstein showed the driving force in neighboring-group participation reactions. Brown discussed polar versus steric effects, trialkylboron-amine complexes, and ring strain. Woodward discussed alkaloid biogenesis in relation to the structures of strychnine and yohimbine. Oakwood presented evidence concerning the origin of petroleum. Plenty of time was allowed for discussion, which was perceptive, critical, and wide-ranging. The entire period of the Conference was an awakening experience. After my own talk on catalytic reductive cyclization as a synthetic route to pyrrolizidines and quinolizidines, I received valuable comments and advice.

My travel expenses amounted to \$192.40, paid by Stanford. That total is also something of a landmark! Nell accompanied me on this trip to California, which gave her an appreciation of the beauty, vastness, and variety of the country. How did we manage the trip since our son, Kenneth, was only four and one-half months old? He was an easy baby, and a friend and helper, Mrs. Rhea Mall, was almost a second mother to Ken. She simply moved into our home, the first floor of a two-family house at 805 West California in Urbana, Illinois. Dee and Marie Hall, who lived on the second floor, were already practically second parents, so there were really three people who would take care of all of Kenneth's needs in our absence. We travelled via the Panama Limited on the Illinois Central Railroad to Chicago in the morning, saw the best of Chicago according to NJL, and boarded the California Zephyr in the afternoon. We had excellent accommodations, food, and service, and every mile of the trip was a

revelation to Nell—to me as well from Glenwood Springs, Colorado westward. We arrived in Oakland and, filled with excitement, took the ferry across San Francisco Bay to settle in the Fairmont Hotel on Nob Hill. What a treat for both of us! We were happy tourists for two days in San Francisco as we sampled the sights and sounds, the transport and the food. Then we went on to Palo Alto, where Nell enjoyed the hospitality of the Stanford faculty wives and some people to whom we had introductions from our Illinois friends.

At the close of the symposium, we boarded the train for a luxurious overnight trip down to San Diego to meet our ride back to Urbana, Illinois. Professor Jane Watt, who was a piano accompanist of mine at the University of Illinois, needed passengers to help her drive her car across country, and we were the ticket! We adjusted to each other fairly well and remained friends after the three-day journey to St. Louis. There I was dropped off to attend a National Meeting of the American Chemical Society, while Jane and Nell continued homeward at an accelerated pace for Nell's reunion with son Kenneth. He was his happy, smiling, kicking-in-the-air self, and he seemed a good bit heavier, probably the result of being fed by three pseudo-parents. I carry a few special memories of the trip home. We drove through the desert at night, and even then the temperature was about 110°F. For cooling the car, we used a window device that contained ice. The intake air flowed over the ice and gave some relief, at least to the person seated next to that window. We rotated. Recall that 1948 was before interstate throughways. To avoid traffic, congestion of the towns and cities, and the heat of afternoons, we did our most comfortable and efficient driving when we started early each morning. Jane's "The car runs better when its gas tank is full" could be translated as "I would like to stop at the next gas station." Her "I am told that you should climb hills at 35 miles per hour" defies translation. In the possibly 2000-foot rise going up beautiful Oak Creek Canyon, I had to prove to Jane that the car was on the point of overheating at 35 mph, and I could prevent this by driving at the fastest rate of speed the road would allow. Recall that overnight accommodations along the highways were still fairly primitive in 1948. Cabins had not given way to motels. Air conditioning and swimming pools did not exist. Most cabins did have showers, and a cold shower was the usual method of reducing body temperature enough to sleep. Nothing could detract, however, from the pleasure of being "on the road," seeing the beauty of America in all its variety, and sampling the friendliness of its citizens wherever we were on the journey. This was the first trip that chemistry provided for Nell and me together.

## CONGRESS OF THE INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY

Zürich, Switzerland, August, 1955

The first IUPAC meeting that I attended was in Zürich, Switzerland, in 1955. I recall being excited about attending an international conference, especially one in Switzerland, where I had spent part of my 1953 sabbatical. I would see old friends again. I would also travel with a friend, namely, Thomas Carney, who was the Director of Research at Eli Lilly and Company, Indianapolis, Indiana, where I was a chemistry consultant. We met in New York to fly from there directly to Zürich. The contrast between the initiation of the journey and the final destination was remarkable. I started close to dawn from a rented summer cottage in Dunewood, north of Manistee, Michigan, driving in a convertible, top down, through the tiny communities in the Manistee National Forest area. The major problem was avoidance of the deer that were crossing the country roads undecidedly in the rising mist. The minor problem lay in making sure that my plotted short cuts would eventually join State Route 37 and direct me to Grand Rapids, from whence I would fly to New York to connect with Tom and the Zürich-bound plane.

Tom had allowed me to select the hotel where we would stay in Zürich. There is no doubt that he would have preferred a less modest place than the pension in which Nell and I had been quartered in 1953 when I lectured at the University of Zürich and the ETH, but he was a good sport and that was where we stayed. It did seem somewhat less attractive on second acquaintance. We heard some outstanding plenary lectures by the leading chemists of the day, and we listened selectively to the short talks that were held in various classrooms of the ETH and the University. I gave a short talk and was shocked that it was over in the allotted 20 minutes even though I was not through! Flashing lights and a strict chairman saw to that. Another lesson had been learned, with some embarrassment.

The conference provided an excellent opportunity of meeting chemists from other countries. Elkan Blout, who was also attending the conference, and I were walking together down a street in Zürich when we chanced upon Ephriam Katchalski of Israel. Elkan and Ephriam had not met previously, but both had been doing very similar research independently, the oligomerization and polymerization of amino acids via N-carboxylic anhydrides. They were delighted to meet, excited to share their latest results, and oblivious of their surroundings, including friends standing nearby (and eventually slipping away). The lessons learned, if they had

not been recognized before, were that science is indeed international and that scientific interests held in common cement friendships. Elkan and Ephriam have remained fast friends, and Ephriam has always stayed with the Blouts in Cambridge, MA, during his many visits to the United States. In time, Ephriam Katchalski-Katzir became President of Israel and had a very successful term in office. His prior position at the Weizmann Institute produced a sound organization and research that was well appreciated.

When I saw Professor N.K. Kochetkov of Moscow, I wanted to talk with him, but either the time was inconvenient—he was about to lecture—or else he didn't recognize who I was or what I wanted. We did parallel research in chemistry, even changing fields to similarly related fields, over a period of more than 30 years, yet we have never met officially. It was not until 1975 that I met two of his younger coworkers and had the opportunity of sharing chemical experiences and speaking of the remarkable phenomenon of parallel research interests, not competing but confirmatory. I had greater success in meeting Gabor Fodor of Hungary, who turned out to have an outgoing personality as well as some shared research interests. We had our best talk on a walk to a shared destination, the main railway station of Zürich. Gabor expressed himself freely when the Soviet Union later invaded Hungary, and he was placed in confinement for about one year. Somehow, when he was freed, he managed to go to Canada. Following a professorship in one of the French-speaking universities, he emigrated to the United States and a professorship at the University of West Virginia. We were able to maintain contact through all of these shifts, and he acknowledged my sustained friendship by inviting me to his home and for a lecture at West Virginia when he had settled there.

The delegates to the Congress from the United States organized a reception for some of the attendees from various nations. It was at this reception that I met David Ginsburg again. He had been a student at Columbia University in a laboratory course in which I was the teaching assistant. I had recognized his brilliance, but I had also chided him for being lazy. In the intervening 21 years, he had received a Ph.D. in chemistry, had emigrated to Israel, had done research at the Weizmann Institute, and had built up the Department of Chemistry at the Technion-Israel Institute of Technology in Haifa. Moreover, his excellent research deserved the attention it was receiving. I greeted David warmly and asked him what had happened, how had he been so energized. He replied very simply by saying, "I would like you to meet my wife; she's a Sabra. That," he said modestly, "explains everything." On one of his lecture tours of the United States, David later visited the University of Illinois and stayed

with us, and in 1968 I was a Visiting Professor at the Technion. Nell and I spent a month in Haifa, and we toured Israel during my sabbatical leave from Illinois. At this particular cocktail party in 1955, the American hosts were most generous and solicitous. It provided a fine opportunity to meet and talk with the most outstanding attendees. However, a certain naiveté with respect to the mixture of guests became obvious when a certain German professor arrived. He was known to have been a consultant to the I. G. Farbenindustrie on the lethal gas that was used in the notorious concentration camps. Upon his arrival, the Israeli delegates departed.

Other receptions and dinners filled the social schedule at the Congress. Some of them provided undue amusement. I found myself talking with the great Professor Paul Karrer of the University of Zürich at a reception in the Town Hall. We were standing in the balcony of the building, and he was speaking in his customary quiet and precise manner. In the hollow center on the first floor, there was a lot of yodeling and accordion playing that drowned out Professor Karrer's voice. Picture the dilemma of the young chemist, happy to be in the presence of the famous professor whom he had met only two years before and trying to react in a positive way to his muffled conversation. The noise was confounding. We were both rescued finally—he must have been equally uncomfortable—by someone blowing on an alpenhorn as part of the Swiss entertainment. Another evening brought music that was more subdued: a quartet playing inside a castle courtyard into which we had all ascended by torchlit guidance. It was a treasured setting, enhanced by moonlight, and the music was well played. On the evening of the main banquet, we had gathered outside the entrance to the hall, and I was talking with Professor and Mrs. Pl. Plattner of Hoffmann-LaRoche. I asked if I might sit with them. That question was superfluous. I had been invited to be their guest much earlier, and I simply had not caught their intent (in German). The seating at the table had been arranged so that I would have the maximum opportunity of becoming acquainted with the other members of the Hoffmann-LaRoche research administration. The banquet was indeed very special, and my fortunate relationship with Hoffmann-LaRoche was sustained for many years thereafter. On the final evening of the conference there was a farewell dinner involving an excursion on the Lake of Zürich to Rapperswil, where a dinner was to follow the generous hors d'oeuvres that were served on the boat. It would have been one meal too many for me that week! When I saw near the Rapperswil dock that a section of the lakeshore had been fenced off for swimming, I made the decision that a swim would be better than a meal. I lagged behind at the dining area entrance and shifted over toward the swimbath entrance, where I rented a suit, paid the

necessary fee, and enjoyed a solitary swim for the length of the dinner. I had made the right decision, as I could see from the over-satiated bodies that exited the restaurant in time for the return boat trip to Zürich at the other end of the lake.

The lessons learned from my first international meeting were remembered for all future conferences, of which there were to be many.

## NATIONAL ORGANIC CHEMISTRY SYMPOSIA

**American Chemical Society  
1951, 1955, 1961, 1971, 1981**

National Organic Chemistry Symposia are generally held biennially in June of odd-numbered years under the sponsorship of the Organic Chemistry Division of the American Chemical Society. Usually, a dozen speakers have been selected by the members of the Organic Division to present their latest research results, and in recent years this complement has been augmented by the winner of the Roger Adams Award and by a popular lecturer who speaks along historical lines. The series of symposia were reinstated after the Second World War with a program in Boston in 1947 that I could not attend. However, I resolved to attend symposia thereafter on a regular basis, stimulated by the enthusiastic response of my colleagues who had attended the Boston meeting and by the realization that each symposium presented the opportunity of hearing about the very best research in organic chemistry that was going on in the United States.

The 1949 symposium, which was held at the University of Wisconsin, Madison, Wisconsin, was attended by a large contingent of organic chemists and some biochemists from the University of Illinois. The relaxed program that was spread over four days in beautiful surroundings gave those of us who attended the chance to talk chemistry and to become better acquainted. The year 1951 is the first listed in the heading above because that was the date of the first symposium at which I was selected to be a speaker, and I was also a speaker in the other years listed. The location of the symposium in Denver induced Nell and me to drive to Colorado and to do some sightseeing before and after the meeting. Separation from Kenneth and Marcia was made possible through the help of marvelous pseudo-parents. Ken, age three years and two months, was adopted temporarily by Dee and Marie Hall, whom he adored, and Mrs. Rhea Mall moved into the house at 805 W. California Street to take care of Marcia, then at an active and vocal one year and a half. Mrs. Mall was assisted by a young lady whom she had recommended and who thereafter served frequently as a babysitter.

Nell and I drove out through Iowa and Nebraska and as far into Colorado as Greeley during the first and second days. Then, we explored the little towns on the eastern slope of the Rockies, ending up in Gold Hill, where we were guests of John and Catherine Bailar. John taught General Chemistry and Inorganic Chemistry at the University of Illinois and ran our summer sessions. This period in June was their brief time for vacation in a small mountain cottage. What do I remember from that visit? Drawing water from their well and toting it up the steep mountain path; a roaring fire in the fireplace, playing bridge with real pros; and on the second day, driving the four of us in the Mercury convertible, top down, along a dirt track that had been a narrow-gauge railway's right-of-way, over wooden bridges and through cuts, making like a train and hoping not to meet another "train" advancing from the other direction. The upper "terminal" was the site of an old mountain inn that had burned down years before. The view as dusk approached was spectacular. Something else approached us, too. We had to duck and run from two huge owls who seemed to be disturbed by our presence. The wingspread of those owls grew wider each time we recalled the episode. In addition to being a great cook, Catherine Bailar was an accomplished weaver. Their sons, whom we got to know, were very ambitious. The younger son, Ben, among his various enterprises, was Postmaster General under President Carter. John, Jr., is a frequently quoted Professor presently in Harvard's School of Public Health and is a statistician of medicine.

We left the Bailar's hospitality with some reluctance and descended to Denver and the Organic Symposium. I was Secretary of the Organic Chemistry Division of the A.C.S. at the time; accordingly, I had official duties that kept me busy in addition to preparing for and giving my maiden lecture. Nell found friends among the spouses of the attendees, we ate well, and the afternoons were free for sightseeing. After the symposium, we drove through Estes Park and over to U.S. 40, then east, ending up at the Beavers Lodge in Winter Park, which was well-known to me. In order to appreciate the high mountain scenery to the maximum extent, I had driven with the convertible top down, which was not so smart, considering the brightness of the June sun and the high altitude. I was unaffected by the experience, but Nell was on the verge of a very bad sunburn. It was lucky that Hortense Beaver was a cosmetician as well as an innkeeper (and a professional dancer). She knew just what to do to treat the potential burn. A facial and a suitcase full of cosmetics forestalled the pain and the damage that might have resulted. We drove back to Illinois through Colorado, Kansas, and Missouri more sensibly, with the top up. There were no freeways then. We used the regular national highways and very

early morning departures. When we arrived home in the evening of the second day, Nell rushed immediately to see Marcia and, although I advised against it, picked her up to hug her. Great tears of surprise and fright from Marcia. Who was this person whom she hadn't seen for two weeks? With Marcia back on Mrs. Mall's ample bosom, the tears were finally quelled, but it was obvious that both Mrs. Mall and Nell should be present when the next day dawned, and they were. Peaceful coexistence and mother instinct fulfilled!

I was a speaker again at the 1955 Organic Chemistry Symposium. That meeting, which was special in that there were three speakers from Illinois, John Bailer, E. J. Corey, and myself, was held at Purdue University. E. J. had come upon the national and international chemistry scene rapidly. He had received his Ph.D. from M.I.T. in 1951 and seemed destined to become a major figure in organic chemistry. This, indeed, he has become, for he is now a mainstay of Harvard's Department of Chemistry and Chemical Biology, and he has won both a Nobel Prize and the Japan Prize along the way.

The 1959 Organic Chemistry Symposium, which was held in Seattle, Washington, included a new element, the Roger Adams Award in Organic Chemistry sponsored by Organic Reactions, Inc., and Organic Syntheses, Inc., together with a requisite award address, that enlivened and enriched the program. It came about in the following way, which was somehow influenced by the writer. In 1958, there was discussion as to how to honor Roger Adams, the University of Illinois chemist—and my first boss—who had been a dominant force in U.S. organic chemistry during the first half of the twentieth century and who had performed great service for chemistry, the American Chemical Society, University, industry, science in general, and the U.S. Government. The magnitude of his international contributions will be recognized when one is reminded that he was the Science Adviser to General Clay in Germany in 1945 and then Science Adviser to General MacArthur in Japan in 1946, *inter alia*. Many ideas were afloat for honoring "The Chief," running from a special issue of the *Journal of the American Chemical Society* to naming the library after him in the new American Chemical Society building in Washington, D.C. To me, the suggestions I had heard ran the gamut from A to B, to steal part of a phrase from the pen of Dorothy Parker, meaning no imagination, no breadth. The question became the topic of conversation at a hotel breakfast of friends at the San Francisco National Meeting of the American Chemical Society in September, 1958. The group included Bill and Barbara Johnson of the University of Wisconsin, later Stanford University, Jack and Edith Roberts of Caltech, David and Connie Curtin of the University of Illinois, and myself. We devised a better way to honor Roger Adams that at the

same time would recognize the publications that he founded (with others), *Organic Syntheses* and *Organic Reactions*, and the biennial happening, the Organic Chemistry Symposium, that he initiated (with others). The other six at the table all looked at me and somehow assigned me the task of making it happen. I balked but finally acquiesced.

Making it happen was not that easy. First, I had to neutralize "Speed" Marvel, my colleague and Adams' longtime friend and his facilitator in all things. Speed was leading the fund drive for constructing the new ACS building, and he considered the naming of the library a fund-raising strategy. I managed to convince him that very few of the 100,000-odd members would ever venture into the library or would even recognize it by the Adams name. Instead, wouldn't it be more appropriate to have his old friend's name associated with a special event to be celebrated by all his constituents every two years? Another of Roger's old friends, Arthur C. Cope of MIT, was President of the American Chemical Society and headed a committee to consider the question officially. I was appointed a member of his committee and pushed for the R.A. Award idea. *Organic Syntheses* and *Organic Reactions* indicated that they would provide the cash funds for the award. The committee had voted by December of 1958 in favor of the Award in Roger's name. I felt strongly that the next step should be an interview with Roger to apprise him of our intention and to seek his opinion on a number of points. I knew him well enough to realize that he would not like a surprise with his name attached if the award terms were not fully agreeable to him. We drew up a list of questions that were approved by Art Cope and his committee, and I interviewed Roger in January, 1959.

He was very pleased with the general purpose. "No," he would not accept the first medal. "That would signal that the medal was for the 'old boys' of organic chemistry—Ruzicka, Karrer, Robinson, etc." He was willing to accept a bronze casting of the medal as a souvenir and keepsake, but he hoped the Award, intended to consist of a gold medal, a silver replica, and \$5,000, would be given to a younger scientist. He said further that it should be international. He approved the wording, "The award shall be granted to an individual without regard to nationality for outstanding contributions to research in organic chemistry defined in its broadest sense." He added his own terms: the first medal should be awarded at the Organic Chemistry Symposium in June, and the Cope Committee should "stand up and be counted;" that is, decide on the first awardee and publicly confirm its role in the decision. In years thereafter, the administration of the Roger Adams Award could fall under the regulations of the American Chemical Society that require President-appointed secret committees to decide on the recipients of all their awards.

Adams' wishes put us to work immediately. Each member of the committee supplied Art Cope with one name of his favored candidate, and the awardee was decided on the first ballot: Professor Derek H.R. Barton of the U.K. It was fortuitous and propitious that the announcement could be made when Derek Barton was delivering a special named lecture at the University of Illinois, Urbana-Champaign, in the Spring of 1959, and he and Roger could be interviewed and photographed together. John Wiley and Sons, Inc., the publishers of *Organic Syntheses* and *Organic Reactions*, agreed to provide the medals, and some scrambling was done in order to obtain a sculpted likeness of Roger that was suitable for embossment. We also convinced the Organic Chemistry Division officers that the Division, the third party in this operation, should add another speaker, at short notice, to their roster of speakers at the Symposium and should pay his travel expenses. We acted just barely in time to make all the deadlines. Karl Folkers of Merck and Company, who was President of the Organic Division at the time, established the protocol for the presentation in Seattle in June. I am writing all this because the history behind the Roger Adams Medal gets lost somehow, and each of the parties that contributed has to be reminded of past and present obligations. When I gave a short introduction at the time of the Award to K. Barry Sharpless of Scripps Research Institute in June of 1997, in San Antonio, Texas, most of the listeners reacted as though they were hearing about it for the first time.

The gold medal, alas, is no longer as valuable as 18 karats, but the accompanying cash prize was raised to \$10,000 in 1967, when Jack Roberts received the Award, and is now \$25,000, equal in cash amount to the Arthur C. Cope Award that was initiated in 1973. I had in my possession at one time a letter from Art Cope stating that the R.A. Award, named after his rather special mentor, should always remain a premier award of the American Chemical Society.

In 1961 and again in 1971, I had the honor to be invited to speak at Organic Division Symposia. The invitations kept pace with the changes in the emphasis of my research at approximately decade intervals. What more could I ask than such appreciation for my chemistry that even followed along with my whims of changing interest? When I was given the Roger Adams Award in 1981, I was able to introduce a new topic to the audience: stretched-out versions of coenzymes that had biological activity and, by their fluorescence properties, indicated the tightness and mode of their binding to accompanying enzymes. My research students and postdoctorates who attended the Vanderbilt Organic Symposium in Nashville, Tennessee, wore T-shirts bearing the stencilled structure of

the parent chemical, along with the motto in Latin, "The bigger the better." They were in a very good mood, as was I. There was only one brief moment of sentiment. When I looked at the medal that Paul Gassman of the University of Minnesota, Chairman of the Division of Organic Chemistry, was presenting to me and I gazed upon the likeness of my tough mentor and old friend, Roger Adams, I had trouble starting to speak. When I looked out at the audience, I recalled what I was there to do. Someone took a picture of the presentation, with our figures shadowed against the white, lit screen (no slides yet). Later, I showed this photo to my good friend and colleague, Harry Drickamer, at which he remarked, "Oh, I see that you were able to show all of your work on one slide!" What support! What a friend! Nell listened to my talk, the second such experience for her, and she and Lucile Adams, Roger's only child, attended the celebratory dinner that is a customary part of the Symposium.

From *Chemical and Engineering News*—August 25, 1980

**Roger Adams Award in Organic Chemistry**  
*sponsored by Organic Reactions Inc. and Organic Syntheses Inc.*

His research "spans an impressive range of heterocyclic chemistry, of molecular rearrangements, and of contributions to the organic chemistry of nitrogen. In first class research extending over one third of a century [he] has woven a strong and durable part of the fabric of modern organic chemistry." This is the way one admiring associate sums up the contributions of NELSON J. LEONARD, professor of chemistry and biochemistry at the University of Illinois, Urbana.

The award winner's early interest in steric congestion in medium-sized ring compounds led him to examine transannular interactions of various functional groups juxtaposed because the groups were part of such a ring system. He used a variety of physical methods together with unique syntheses in these classic studies.

His syntheses of fluorescent derivatives of nucleosides, nucleotides, and coenzymes, and his illustrations of their potential uses resulted in their wide acceptance by other researchers in enzyme chemistry and nucleic acid chemistry.

Leonard's research has provided modified enzyme substrates and co-factors in which the critical distances between functional groups have been stretched by interposing a benzene ring into a fused ring system. "In this work his knowledge of biological chemistry complements his skills in synthetic organic chemistry and his mastery of the physical-organic methodology which was developed in his earlier stereochemical studies of transannular interactions," a colleague points out.

Leonard is presently engaged in synthesizing additional "dimensional

probes" of enzyme binding sites for purine substrates or cofactors.

Leonard received his Ph.D. from Columbia University in 1942. He has spent his entire career at the University of Illinois, joining its junior faculty in 1942 as a research assistant to Roger Adams. From 1954 to 1963 he headed the division of organic chemistry at Illinois. In addition to his professional

appointments, he is a member of the university's Center for Advanced Study.

His numerous honors include the ACS Award for Creative Work in Synthetic Organic Chemistry in 1963 and the Medal for Creative Research in Synthetic Organic Chemistry of the Synthetic Organic Chemical Manufacturers Association in 1970.

## SYMPOSIUM ON BIO-ORGANIC CHEMISTRY

University of California, Santa Barbara, 1965

Thomas C. Bruice, who organized the second symposium at U.C., Santa Barbara, in an area of chemistry referred to as bio-organic chemistry (with or without the hyphen), was (is) a colorful figure in science. As a child, he spent the first years of his life in foster homes. When he was eight years old and a resident in an institution for children, he obtained his first chemistry set and became interested in all kinds of science. He quit high school in his senior year to serve in the U.S. Marines, following which he went to college and completed both B.S. and Ph.D. (in bioorganic chemistry) degrees at the University of Southern California. After a postdoctoral year at UCLA, he took a teaching job at Cornell University. During one particularly cold and snowbound winter in Ithaca, he made a precipitate decision to return to his native California, and that is why he could be hired readily by Santa Barbara. There he kept a long surfboard in his office for use whenever the surf was up. We became good friends. His wife, Paula, is also a good friend, an excellent chemist in her own right, and the author of a fine textbook of organic chemistry, the first edition published in 1995.

The Santa Barbara Symposium was an occasion when bioorganic chemistry was recognized as an expanding, dynamic area of fundamental and practical interest. Those who were the invited speakers at the symposium had all realized at some stage that their research interests did not end with organic chemistry—structural, synthetic, or kinetic—but that they now involved biological material. In short, they were using familiar principles and techniques toward solution of problems relevant to biology. In addition, some were being guided in their chemical studies by inspiration resulting from tangential biological observations. I mention all this to record the

initial coming together of chemists who had begun a research engagement with broader purpose. From 1965 onwards, we followed each other's work more closely and met more frequently as the field of bioorganic chemistry expanded and became better appreciated. The funding agencies, the National Science Foundation and the National Institutes of Health in particular, were supportive of the growth in the field. The Santa Barbara Symposium even received public coverage in an article that appeared January 28, 1965 by the *Los Angeles Times* Science Editor, Irving S. Bengelsdorf. It was not until 1985, however, that the International Union of Pure and Applied Chemistry held the first International Symposium on Bioorganic Chemistry and until 1993 that the first Gordon Research Conference was held under this title.

## GORDON RESEARCH CONFERENCES

1958, 1966, 1968, 1969, 1970, 1972 (2), 1973, 1976

The Gordon Research Conferences are named after the late Professor Neil Gordon of Wayne State University, Detroit, Michigan, who initiated the Conferences in the early 40s and who helped to establish the philosophy of their operation. The purpose of the conferences, according to the latest informational brochure, is as follows:

“At a Gordon Research Conference scientists with common professional interests come together for a week of intense discussion and examination of the most advanced aspects of their field. These Conferences provide a valuable means of disseminating information and ideas in a way that cannot be achieved through the usual channels of communications, such as publications and presentations at large scientific meetings.”

To encourage open communication, each member of a Conference agrees that any information presented at a Gordon Research Conference, whether in a formal talk, on a poster, or in discussion, is a private communication and is to be treated as such and is not to be referred to in any communication or publication. One applies to attend a certain Conference, or one is asked to speak, or, in certain cases, one helps to organize a specific Conference. I had experience with each one of these roles in the years cited, at various Conferences: Chemistry of Natural Products, Reactions and Processes, Nucleic Acids, etc. Attendance is always limited.

The venues during the years that I attended the Conferences were particular preparatory schools in New Hampshire that were closed as schools during summer but were available for meetings, such as New Hampton School, Tilton School, and Holderness School. The dormitory rooms were not very comfortable, but, then, they were not occupied for many hours! When there were no talks or poster sessions, there was endless discussion among the practitioners of various research areas, whether in select groups, at meals, in the bar before dinner and on into early morning, on the golf course, on the tennis court, or while sailing. There was truly ample opportunity for those with similar research interests to learn about current advances and future plans. In my experience, the attendees were most generous with information and advice, as they were also generous with questions and criticism. At each Conference that I attended, I felt that I had picked up a new idea or a new approach for my own research in addition to disclosing our latest results. At the last Conference that I attended, I concluded that Gordon Conferences were really best-suited for younger scientists. The intensity level of 4½-5 days had become exhausting, although in earlier years I had helped to establish the level. Nell did her part in establishing the intensity level during the one Conference that I had succeeded in getting her to attend with me. She played tennis every morning and golf every afternoon.

The number of Gordon Research Conferences and their locations have expanded. There are now eight locations in New Hampshire and Rhode Island where summer Conferences are held, winter Conferences are held in California, and International Gordon Conferences are held in the U.S., Japan, Switzerland, Italy, and China. They provide the opportunities for making friendships that transcend national and regional boundaries. They also cover the hot, new research areas. The titles of the Conferences are a function of interest and excitement, and each Conference must generate a sufficient number of approving attendees to be renewed. Neil Gordon would be both gratified and amazed if he could know of the growth and breadth of the operation that he initiated.

## **SECOND INTERNATIONAL CONGRESS OF HETEROCYCLIC CHEMISTRY**

**Montpelier, France, 1969**

An invitation to speak at this conference in 1969 provided the opportunity of visiting Nell's mother, father, sister Els, and other relatives

and friends in Holland and sister Hilda in France. We rented a car in Holland and made it approximately halfway to Montpellier on the first day, stopping overnight in the vicinity of Dijon. On the next day, we tired of the main autoroute and shifted to the red route, so marked on the map, that followed the west bank of the Rhone River. Lunch in a small country restaurant provided one of those experiences when you feel that life cannot get much better. On a balcony overlooking the entire valley to the south, we had our bread, cheese, salad, and red wine and felt that we were indeed in Paradise. When we reached Montpellier, we arrived at our Motel de Tourisme by following a veritable maze of one-way streets. The motel was worthy of its multiple stars. The rooms were designated not by number but by names of flowers indigenous to the region. All of the speakers and their spouses were lodged in these sumptuous quarters, which made for convenient and delightful "meeting and greeting."

I had some new material to present on cytokinins, plant hormones that lead to cell growth and differentiation. I had prepared my talk to be read, at least partially, but I discovered abruptly that the configuration of the lecture room at the University of Montpellier was not conducive to any reading or referring to notes. I had to give an impromptu speech, but the additional emotion of the moment coupled with my excitement at presenting novel research findings proved advantageous. Later in the week, at a reception, the students gathered around me to drink a champagne toast. They had voted informally that I was the most interesting speaker at the conference. The lesson that was learned (again) was that enthusiasm about the subject, even nervous enthusiasm, is accepted more appreciatively than a careful, scholarly reading about new research material. Because all the speakers were presenting new material, the talks were to be combined in an expedited publication. The written talks, in English or French, were supposed to be provided at the conference, and, indeed, most of the speakers did what they were asked to do. However, one of the speakers, my good friend Hans Schmid from the University of Zürich, did not provide a text of his talk, saying that the chairmen of such conferences always asked for full written papers but he thought that submitting an abstract was work enough. It was some time later that he submitted a copy of his talk, but then in German. The chairman of the conference never did translate Professor Schmid's talk into French or English, which might have been a daunting task, nor did he assemble all the presented papers for publication. I was sad about this because it meant that I did not have written priority on some of the new material I had presented. I had to be satisfied with referral to the

symposium talk itself. I am sure other scientists have had such an experience.

The rented car let us down soon after we arrived in Montpellier. Nell spent some time resolving the problem: a new battery that would not hold its charge. Nell's knowledge of French and Dutch, the latter for calls back to the rental agency in Holland, was necessary for satisfactory resolution of the problem at no cost to us. Then, we were free to roam the countryside during the afternoons that remained in the conference week. Most notable was a trip to Nimes, where we overphotographed the already most-photographed Roman aqueduct. A trip to Orange was obligatory because of its association with William of Orange, the liberator of Holland from the Spanish. At the end of the conference, we took to the road from Montpellier to Bousic, in the Dordogne region, where sister Hilda and Paul Renardel de Lavalette had converted an old French farmhouse into a comfortable country vacation house. On the map, our chosen route appeared to be the most direct. However, the hills and near-mountains that intervened were not very well marked on the map, and the little squiggles became "virages," signifying many, many turns and necessary slow speed. We arrived in Bousic—it is a tiny spot on the map—very late for the dinner party that Nell's sister had planned. The word "virages" became our explanation whenever either Nell or I would be late for any planned meeting. It was much better than some long-winded, accurate excuse, and for us it was reminiscently pictorial. There are many "beauty spots" in the vicinity of Bousic, marked thus on the map, and the local food and wine give delight. Most memorable were our visits to Castelnaud, Domme, les Eyzies, Lascaux, Sarlat, Cahors, Gourdon, and Montfort. On the drive back to Holland, we stopped for the night in champagne country, where we did some discrete sampling. The trip was thus a mixture of synthetic chemistry and natural chemistry, ending on the latter.

## SYMPOSIA IN POLAND

1974, 1979, 1984, 1998

It is somewhat surprising that, after the Netherlands, the United Kingdom, and Switzerland, the next country that I have visited most frequently is Poland: six times in all. Nell accompanied me on three of those occasions, the first trip to Poznań, the lecture tour in 1978, and the awarding of the honorary degree in Poznań in 1980. The 1978 and 1980 trips are discussed elsewhere.

## Recent Developments in Oligonucleotide Synthesis and Chemistry of Minor Bases of tRNA, Poznań—Kiekrz, 1974

My friendly relationship to Poland was probably derived from a number of sources: meeting Polish chemists at international conferences; having Polish postdoctoral research associates in my group at Illinois, two prior to 1974 and four after that year; helping to arrange lecture tours of several Polish professors in the United States; and my willingness to journey to Poland under my own funding to attend symposia and conferences. The first invitation came in 1974, and the topic (see above) was one that interested me. The timely subject attracted an outstanding international group of speakers and discussants. The conditions were somewhat less than ideal, e.g., the city's electric power went off occasionally, but the speakers learned to deal with the situation because the hosts apologized for all deficiencies and were so eager to please and to accommodate. I am looking back at my contribution in the form of a research paper. It bore little resemblance to any chemistry that would have been experienced in Poland, and the figures in the articles, in retrospect, look a bit dull and repetitious to me. However, at the time of presentation, I was excited and enthusiastic about our work. In fact, the methodology has not improved appreciably since then for accomplishing what we were able to do. We reported on a high performance liquid chromatographic system that allowed the separation of all the known naturally occurring cytokinins (plant cell division, cell differentiation factors) and the assignment of their stereochemistry. We obtained additional confirmation of structure by indirect coupling to a field desorption mass spectrometer, which led to the direct determination of the molecular weight of each compound, even for the labile cytokinin ribonucleosides. The work, part of the Ph.D. thesis of Douglas L. Cole, aided by staff member Dr. J. Carter Cook, Jr, was supported by research grants from both the NSF and the NIH. I met many researchers in the nucleic acid field, and the social and recreational part of the symposium constituted our introduction to another side of life in Poland. The return trip from Poznań to Warsaw—these are not separated by too many miles—was amusing because our overnight train was pulled by an ancient steam locomotive, and Nell and I were assigned to adjacent sleeping compartments containing three-decker bunks. Because each of us was the last to enter the compartment, we had to clamber up to top bunks, above two already-sleeping fellow travelers. Each of us was the last down in Warsaw to use the common washing facilities. A flight to Amsterdam and visits with family in Holland revived our spirits. A sense of humor helps under certain circumstances.

## International Symposium on Phosphorus Chemistry Directed Towards Biology, Burzenin, Poland, 1979

This symposium was held at a resort near Łodz, which we reached by bus from Warsaw. Nell was not along on this trip, having preferred to visit family in the Netherlands, where we connected again after the symposium. The conference was worthwhile, and I made some new friends. However, my chief remembrance of the occasion was that there was a lot of laughter. I must have been in a puckish mood because friends have occasionally reminded me of some of the happenings. The first item was "Mephisto." One of the U.S. speakers, whose name will not be revealed, was particularly aggressive in describing his contributions (which were indeed appreciable) in comparison to the work of others. Later, another speaker was having difficulty remembering or pronouncing his name, so I called out "Mephisto," which produced a shock of laughter—or the laughter of shock. I must have been emboldened by the audience's response, because on the following day, I produced a second item that was remembered. We might call it "Sold." Two U.S. chemists were arguing, after the lecture of one of them, about how accurately they could measure something. Their numbers became more and more exaggerated as they tossed them back and forth. The chairman at the time, who was Polish, was very polite and did not know how to stop the pointless contest. Finally, I called out, "Sold!" which stopped the process and again produced laughter. The third item might be called "1939." It was a somewhat quieter contribution. A delegation from the symposium went into Łodz to meet the mayor of the city. We were told there was an old German song that was popular, "We're Going to Łodz", that celebrated a journey to this watering place. One of the members of the delegation, a German, wondered aloud when it was popular. I blurted out, "September 1939" (the month that Germany invaded Poland at the start of the second World War). Hushed laughter this time.

On the way into the conference room of the Mayor of Łodz, my friend Jan Michalski, who was leading the delegation, took me aside and whispered that I should acknowledge the Mayor's greeting. What a trick to play on a good friend! Fortunately, the speech of the Mayor took some time, with translation, so that I had some moments to outline mentally what I would say—something along these lines: that we were grateful for his hospitality; the International Union of Pure and Applied Chemistry, being an international organization, represented the

harmony and unity of science; many different countries were represented by the attendees at the symposium; the subjects for discussion were those in which the Polish chemists were making important contributions; as a resident of the State of Illinois I could remind the Mayor that we had a Polish population that rivaled Warsaw's; as a resident of Urbana-Champaign, Illinois, I could remind him that Łódz had been declared a sister city (that was lucky); and as an individual scientist, I could tell him that I had benefitted from collaboration with three Polish postdoctoral associates. My remarks had to be translated into Polish, but I could discern that the Mayor did not really require the language conversion. Jan Michalski gave me a wink, as if to say, "There, that wasn't so difficult, was it? Well done! All bases covered!"

My roommate in Burznenin was Frank Westheimer of Harvard, who gave a definitive talk on "The Case for Monomeric Metaphosphate." We had been given what was probably the second-best room in the resort complex, but it did have deficiencies. I had been hoping to get some recreational reading done, but the light bulbs were much too weak for that to be possible. Frank saw that the bath mat next to the bathtub was terribly dirty, and he decided that it had to be cleaned before he would be willing to step on it after a bath. I came into the bathroom and found him trying to wash out the mat in the tub. Everything was black. He released so much dirt from the mat that it stopped up the drain. The picture of the famous professor wrestling with this impossible situation made me collapse on the bed with laughter. In a letter written to me in October, Frank would say, "I still wonder whether, with one more try, I could have gotten the bath mat clean." But what about the bath?

After Professor Lord Todd and Lady Todd of Cambridge left the conference, Frank and I were told that we could occupy their suite; however, because of our cleaning efforts plus some assistance from the maintenance staff, we had become rather fond of our quarters. We turned down the offer. We were told later that we had done the right thing. If we had moved into the suite, we would have been in a position of accepting special privilege. We were probably guided less by instinct rather than the prospect of having to clean another bath and bath mat if we were to move.

The joys of the conference were carried into 1980, when I received a letter from Frank Westheimer, of which I have quoted a portion:

*Dear Nels:*

*Pergamon Press was kind enough to send me several hundred reprints of your paper for the Burzenin meeting. I really didn't need so many, so have forwarded them to you. I have also written Pergamon, asking for my reprints, and (just to be prickly) asking for the postage for sending you yours.*

*Perhaps my reprints came to you, or anyway to the University of Illinois. If so, I hope you will send them along—On the other hand, perhaps all the participants got reprints of your article; it may have been judged the only one worth reprinting.*

My article was entitled, "Phosphate Synthesis, Exchange and Interaction in Nucleotides and Related Compounds." Upon rereading the paper at this writing, I am pleased to see that we could provide answers to a number of biochemical questions by means of our chemistry. Another contribution to the symposium was noted when I journeyed to Poznań, Poland, in 1998, and a research associate at the University said she recalled my dancing the polka with her almost 20 years earlier. I can only assume that any apparent ability was based on copying others and fueled by Polish vodka.

### **International Symposium on the Chemistry of Natural Products Poznań, Poland, 1984**

This was the 14<sup>th</sup> in a series of such symposia sponsored by the International Union of Pure and Applied Chemistry. At the time, I was a member of the Organic Chemistry Division of that organization, and I was invited as a Plenary Lecturer at the 1984 symposium. The title of my talk was "The Consequences of Altering ATP." The general purpose of the research that I covered was to assess the size of the space available to the adenine moiety of adenosine triphosphate (ATP) in its enzyme binding sites and to ascertain the dimensional limits for the expression of enzyme-coenzyme activity. The mood in Poland was different from what it had been during my visit in 1979. People were speaking out more, and there seemed to be more optimism about what could be accomplished in changing the government.

The symposium was special in the sense that it gave old friends the opportunity to see each other again. The cadre of organic chemists interested in natural products was an active one, active also in attending these regular symposia that I first joined in 1960, 1962, and 1964. In 1984, I was particularly pleased to spend some time with Professor and

Mrs. Vlado Prelog of the E.T.H. in Zürich. I felt that my life was enriched every time I had the opportunity of scientific and social exchange with them. I have always been grateful that the profession of chemistry provided such an array of international friendships.

**International Conference on Nucleic Acids and Their Constituents:  
Chemical Evolution Underlying Biological Evolution  
Dedicated to Professor Maciej Wiewiórowski on his 80<sup>th</sup> Birthday  
Poznań, Poland, 1998**

In November, 1997, I received an invitation from Andrzej Legocki, Director of the Institute of Bioorganic Chemistry of the Polish Academy of Sciences in Poznań to participate in this conference to be held in May 1998. I responded positively because Maciej was an old friend of mine and one of Poland's outstanding chemists. This is an example of the "international friendships" mentioned above that have meant so much in my life. In a February letter, Director Legocki was more specific about the participation. "We are asking you to deliver a keynote lecture at the opening on Sunday at 5:00 p.m." The advantage of giving a keynote lecture, as described, was that it could be 45 minutes in length rather than 30 minutes. Another advantage was that my job would be over the first day, so that I could enjoy the rest of the meeting. In reply to the organizers' concern that I might be tired on the day of my arrival, I said that if I could be guaranteed 2-3 hours of sleep and an early check-in to the Hotel of Science Center, I should be in good shape to give a keynote lecture. The opening ceremony was to begin at 5:00 p.m. on Sunday, May 10, and I was scheduled to arrive in Poznań on an SAS flight from Copenhagen at 11:45 a.m. The flight rules were now relaxed in democratic Poland. It used to be necessary to fly east to Warsaw and then back west to Poznań by another flight or by train or car. The novel convenience was marred slightly by news received on May 6 that Copenhagen Airport was on strike and that, although the strike was expected to be settled quickly, my connecting SAS aircraft from Seattle to Copenhagen would not be able to get to Seattle. By May 8, I was rebooked on an SAS flight from Newark to Copenhagen, scheduled to arrive there at 7:35 a.m. on the 10<sup>th</sup> in good time to catch the Poznań flight. Why all the details? Just reciting the uncertainties of travel. When I reached Newark, I inquired innocently of the clerk behind the SAS counter whether the economy class on the Copenhagen flight was terribly full. It was. I explained that I had to connect to a flight to Poznań, Poland, and to give a keynote speech at a conference shortly after arrival. The attractive, sympathetic clerk, who happened to

be a Polish young lady in training, raised my status to business class, with the result that I had a restful flight.

The return home on May 14 was no less enjoyable. My standard ploy (for SAS in particular)—“Is economy class terribly full?”—did not work, but the views during the Copenhagen-Seattle flight were spectacular, and I was glued to the window when I was not dozing. We crossed north of Iceland and high across Greenland, Hudson Bay, and vast unpopulated reaches of Canada. In the Seattle airport, one moves to different terminals by small train. When I went from the SAS arrival area to the United Airlines departure area and stepped out on the platform when the nearest door opened (there are many doors), I walked right into son James, who was also in the process of changing terminals at the airport. The completely fortuitous meeting gave us about 20-25 minutes to visit together. It was one of the joyful surprises of travel.

I have included the abstract of the keynote speech as an appendix, along with the part of the speech that dealt mainly with advances of the past year in nucleic acid chemistry and a final word of appreciation about Maciej Wiewiórowski on his 80<sup>th</sup> birthday. The speech was a compromise among all the opinions, gathered beforehand, as to what a keynote address might include. The first part examined the field from the point of view of the nucleic acids themselves, e.g., what have you all been learning about us recently?—“us” being tRNA, mRNA, rRNA, and DNA. This gave me great freedom of selection. I was also certain that no one had ever covered the anthropomorphic ground from the point of view of the nucleic acids. The second part gave past and present results of our own work on pseudo-DNA, and even some “computation” as to the future. In all of the celebratory praise of Maciej and his work that had initiated the Sunday afternoon session, the name of his wife, Marie D. Bratek-Wiewiórowski, had not been mentioned. Yet she participated in most of his work as a very important contributor. I pointed out that the man reached such a high number of years (80) because of the companionship, in life and in science, of a marvelous partner. Half a year later, Maciej and Maria were still thanking me for the excellent lecture and very warm address to both of them on the occasion of his birthday.

One of my former postdoctorates, Bożenna Golankiewicz, now on the staff of the Institute of Bioorganic Chemistry of the Polish Academy of Sciences, was a speaker at the symposium. She and her daughter, who runs a translation service, took me to dinner in a very special, old bar/restaurant. Her husband, Kris, also a former postdoctorate of mine, was ill. Symposium attendees were treated to a concert that featured

selections by Handel, Strauss, and three Polish composers. The roster of speakers included many old friends from many countries. Russia was not represented, however, which constituted a departure from earlier symposia I had attended in Poland. I judged that travel funds were not as available to scientists as in the days of the U.S.S.R. No travel funds were provided the speakers by the Polish organizers, although they provided food and lodging at the meeting. My final observation was that the youth of Poland, at least as represented by the students at the local university, appeared better dressed, healthier and more exuberant, perhaps even taller, than those I had seen in the decades earlier.

## LECTURE TOURS

July 9-22, 1976—Poland

One of the chief benefits of chemistry as a profession, at least of academic chemistry, is that it provides national and international friendships and, with these, the opportunity of travel by lecturing. Such "travel by lecturing" was arranged for Nell and me by Kris and Bożenna Golankiewicz in Poland. Kris had been a postdoctorate with me during 1967-1968, his second such position in the United States. His first postdoctorate had been earlier with Professor R.B. Woodward of Harvard University. In 1976, he was a Professor in the Institute of Chemistry of the Adam Mickiewicz University in Poznań, and his wife, also a chemist, was in the Department of Stereochemistry of Natural Products of the Institute of Organic Chemistry of the Polish Academy of Sciences. They arranged a memorable trip for us by car, Kris driving. The scheduling was impeccable, and we learned to cope with the idiosyncrasies of the accommodations here and there.

We arrived in Warsaw on July 9, 1976, after a flight from Holland where we had a brief visit with family. We were met by Dr. Otto Achmatowicz of the Warsaw Agricultural University, son of a famous chemist who had spent many years as the Cultural Attaché in the Polish Embassy in London. We deposited our luggage at a comfortable hotel, had a selective tour of Warsaw with Otto as the guide, and ended up at his apartment, where we were joined by several old friends. Among them was Otto's brother, Selim, who had been a postdoctorate with me at the University of Illinois during 1964-1966. What a surprise! A word about Selim. He was an accomplished chess player and a seeded bridge player on the European circuit. He and his partner were always expected to finish within the top five in tournaments. When he came to work with me, I made him promise that

he would not take playing cards in hand during his sojourn in Urbana, but I could not deny him the opportunity of giving others of my coworkers an occasional chess lesson. The lessons were usually over very quickly. At our meeting in 1976, he was full of talk, prophetic in actuality, of Solidarity and the upsurge of political activity, illegal and otherwise.

After a good night's sleep, we flew from Warsaw to Poznań, where I visited the Institute of Organic Chemistry of the Polish Academy of Sciences and gave a lecture, while Nell took a guided tour of Poznań. The sightseeing continued over the weekend for both of us, and we found the Kórnik Castle, with its museum and library of old manuscripts, and Rogalin Palace, with its art gallery, to be the most interesting locations. On the following Monday, I gave a seminar in the Department of Chemistry of the Adam Mickiewicz University, while Nell was able to continue investigation of the city. When the tourist service learned that we were guests of the Polish Academy of Sciences, Nell was even given an English-speaking guide and a private car and driver.

On Tuesday, Kris drove us to Toruń, northeast of Poznań. Along the way we saw many tall poles with platforms on top. These had been constructed in an effort to bring the storks back to Poland on their historic flyway that they had abandoned during and after the war years. Their reintroduction was working. Stops at Lednogóra for the Archeological Research Station and the Gniezno for the baroque cathedral were followed by a tour of the old city of Toruń upon arrival there. Toruń was where Copernicus, the great astronomer, first lived, now the site of the N. Copernicus University.

After Toruń, we drove further northeast to the Mazurian Lakes region containing an agricultural preserve and research center. Two very special experiences are fresh in my mind. In the beech woods that we passed, there was very little brush under the trees but there were many wild strawberry plants. We stopped for a long time and, in the beech-filtered light, ate our way out of the center of ever-enlarging, individual round patches of the sweetest berries I have ever tasted. In the woods, one would occasionally see a Polish pony, also enjoying selective foraging. The wild ponies are part of a successful experiment to breed back this very old line, almost extinct at one time. These small tan animals each had a brown, long-haired ridge running down his back. We were guests at the research station and were quartered in small cabins within the preserve. The night was hot and humid, the cabins were not mosquito-proof, and there were not many hours of darkness at that time of year and that far north. I was uncomfortable and could not sleep. What to do? I got up at

about 5 a.m., put on minimal clothing, and headed down a series of small dirt roads in the direction of the nearest lake. Luckily, I had chosen the right path! The little lake, with mist rising in the early dawn, was so inviting that I took off my clothes and swam out into the middle, where I floated happily for a long time, contemplating my good fortune in being part of a forest dawn. A small herd of Polish ponies appeared on the shore to make my reverie complete, also to drink at the water's edge. Half-immersed, the mares and their foal clustered together in a poignant family setting. They were undisturbed by the human swimming toward them, who had tired of floating and treading water. After all, what danger had ever assaulted them from the lake during their evolution and now reintroduction? They were merely curious, allowed me to stroke their necks, and somewhat grudgingly stepped aside while I tried to move among them gently as I reached the shore. I continued to observe them close at hand while I dried off and they eventually moved back into the surrounding woods. I treasure that vision and the experience of Nelson among the Polish ponies at dawn.

As much as this experience was natural and peaceful, the next experience was unnatural and warring, for we stopped to see Ketrzyn, which was Hitler's headquarters for the war against Russia. Hidden by a huge canopy, produced by a wire netting into which had been threaded green plastic and tree branches so as to give total cover, were formidable avenues of reinforced concrete bunkers. The aspect was horrible: civilization reduced to frightful survival. The camouflage and security were such that the headquarters were not detected by the allied forces until Ketrzyn was overrun by the counterattacking Russian Army in their final sweep westward. The high command bunker was the site of the bomb attempt on Hitler's life on July 20, 1944.

The next stop was also important in military history, although from a much earlier time, the 1400s. Malbork was the site of the almost impregnable castle of the Teutonic Order. This military order of monks had come north from the Germanic area and had assumed the role of feudal knights, extending the Catholic religion by the sword. However, they were more involved in terrorizing and pillaging than in spreading any gospel, and they were well hated in the Baltic region. The Teutonic Knights were finally defeated by a combined force of Lithuanians, Poles, and—because of need for reinforcement—Saracens. The territory that included Ketrzyn and Malbork became East Prussia prior to the first World War. I was a bit sad to hear the true history of the Teutonic Knights. As a boy, I had owned a set of attractive toy soldiers who carried shields emblazoned with a large white cross. They were my favorites. They fought

bravely in imagined battles and never would have been involved in pillaging the land and terrorizing the populace!

Further northwest, we visited Gdańsk, which had been the free state of Danzig between the two World Wars. The Germans had completely destroyed the old city. When it was finally freed, Poland decided to rebuild the Hanscatic port as it was originally. As a result, it is beautiful, colorful, and a popular tourist destination. By this time, the restoration has probably paid for itself. It is rightfully a source of pride. We were the guests of Dr. Janusz Sokolowski, the Rector, in a comfortable guest house belonging to the Technical University of Gdańsk, where I gave a lecture on Saturday morning. It was hard to get enough of sightseeing in the restored city, probably the most beautiful I have seen. Further sightseeing included a short trip to Westerplatte, where the second World War was started by Hitler with the first goal of obliterating the Polish Corridor between the two parts of Germany. An organ recital in the Oliva Cathedral topped off our visit to Gdańsk, where we said goodbye to our excellent guides, Bożenna and Kris Golankiewicz.

After the flight to Kraków, in the south, we were treated to sightseeing in the old city, a visit to Collegium Maius, which is the oldest building of the Jagiellonian University, and a specially conducted visit of Wawel, the castle of Polish kings. I did not lecture in Kraków, but the final lecture of the trip was in Warsaw at the Institute of Organic Chemistry of the Polish Academy of Sciences. Final sightseeing in Warsaw included a trip to Wilanów, the summer residence of Polish kings. Then we took off for home, well instructed and quite satiated.

### **March 27-April 14, 1984—People's Republic of China**

During the period March 29-April 14, an official delegation from the University of Illinois, Urbana-Champaign, visited the People's Republic of China. The purposes of the visit were several: to sign exchange agreements with the Chinese Academy of Sciences, Beijing, and with Fudan University, Shanghai; to become acquainted with the functions of different Government Ministries; and to organize lectures and discussions at various institutes and universities. The University of Illinois Foundation sponsored the delegation, which was headed by President and Mrs. Ikenberry and Vice-Chancellor and Mrs. Goldwasser and was composed of ten Professors from the Urbana campus. Within China, the delegates were guests of the Academy of Sciences and Fudan University. The U. of I. Professors represented the areas of administration, computer science, theoretical and experimental physics (including low temperature and high

## MORE THAN A MEMOIR

energy physics), political science, mechanical engineering, ceramic engineering, chemistry, and biochemistry. Jiri Jonas and I were the two representatives from the School of Chemical Sciences.

We all flew from Champaign to Chicago on Britt, from Chicago to Tokyo on Northwest, and from Tokyo to Beijing on PanAm Airlines, with a brief respite in Narita at the Hotel Narita Prince. The major business stops were either in—or in the vicinity of—Beijing and Shanghai. In Beijing, lecture/discussion visits were made by Professor Jonas to the Institute of Physics and by me to the Institute of Biophysics of the Chinese Academy of Sciences; in Shanghai, to the Departments of Chemistry (Jonas) and Biology (Leonard) of Fudan University and to the Institutes of Metallurgy and Ceramics (Jonas) and Biochemistry and Chemistry (Leonard) of the Academy of Sciences. The lectures really became seminars within the definition, “a meeting for giving and discussing information.” I would make a statement comprising several sentences. Then my translator, standing near me, would make the statement in Chinese. Sometimes he satisfied the audience, many of whom knew and understood English, and occasionally there would be a heated discussion about what I had meant. When the point was resolved, I could proceed. A lecture, with slides, of a normal 50-minute length stretched an extra hour. I became accustomed to the format and learned how to use it to advantage so that an animated level of discussion was maintained. The captive audience was in general not eager to go elsewhere, and their sporadic participation meant that they stayed awake. I must say that I enjoyed my “lectures” because of the friendly audience participation. While in Beijing, I was given the chance to “participate” in a song and dance routine at a kindergarten. The children selected me to join the end of their line that rocked back and forth, advanced and retreated, as they (we) sang. The final movement was for all to fall backward, piling on the rear of the line (me). I hammed it up to their great squeals of delight.

No visit to China can be considered complete without banquets, sometimes two in one day, including one in the Great Hall of the People in Beijing; formal ceremonies expressing friendship and continuing cooperation; tourist visits to the Great Wall, the Ming Tombs, Xian and its buried terra cotta warriors, horses, and bronze chariots, the Ponpo bamboo village site of 4000 B.C., the Forbidden City, many palaces and temples, the fabulous scenery and gardens at the West Lake in Hangzhou, agricultural communes, acrobatic troupes, folk dancing, museums, the busy port of Shanghai; and, of course, the now ubiquitous Friendship Stores, where one can spend innumerable foreign-exchange yuan.

There were numerous personal events that made this trip more than a lecture tour and more than a tourist's view of China. Ming-Chien Chiang

(new spelling: Jiang Ming-qian) was a friend of mine when I first came to the University of Illinois. He received a Ph.D. degree under Roger Adams in 1944 and worked at Eli Lilly and Company in Indianapolis until 1947, when he returned to his native China. He rose to become Professor of Physical Organic Chemistry and a member of the Academia Sinica. Then, with the Cultural Revolution, he was banished from the Laboratory of the Academy. Every month the Red Guards would come to his apartment, throw his "foreign" chemistry books and journals out of the window, and make a bonfire of them. On each visit, they would threaten him and demand that he destroy his University of Illinois diploma. Ming-Chien resisted, saying, "This is my education, this is my life," and he challenged the Guards to destroy it. The diploma was preserved, but Ming-Chien was shipped off to the West to "learn from the peasants" and to shovel pig manure. He was separated for about 10 years from his wife, T. C. Tai, who was also a chemist. The worst punishment, for the Chinese believe strongly in education, was that their son was not allowed to go to college.

I learned all this when Ming-Chien came to the University of Illinois on a surprise visit in 1980 when he was, I think, 70 years old. It was a sponsored trip between the Chinese and U.S. Academies of Science, and Ming-Chien had been reinstated and honored, although he professed that he was too frail to make such an extended journey, by being included in the traveling Chinese delegation. While he was in Urbana he stayed in our home, and Nell and I took turns in showing him the town and University that he had left 36 years before, the old and remembered and the new and surprising, including the University-owned airport. Three years later, I could arrange to help his grand-niece, Dai Wei, enter the University of Illinois for graduate work leading to a Ph.D. in Chemistry.

When it became apparent that I might be able to meet Ming-Chien in Beijing during our official tour in 1984, I told President Ikenberry about him, with the result that Stanley wrote him a warm letter praising his loyalty to the University of Illinois. Stan's letter was on the tea table and had obviously been the subject of approving conversation when I arrived at the Chiangs' apartment for a U. of I. alumni dinner. Assembled in the apartment were Chi-Yi Hsing, Department of Chemistry, Peking University; Kuang Hsu Chen, Department of Chemistry, Peking Normal University, whom I knew; and Jennie Ching-I Liu, Institute for Environmental Chemistry, Academia Sinica, whom I knew. Jennie Liu had been a Ph.D. student of John Bailar. The others, including Han Ging Yuan, who could not attend, had been Ph.D. students of Roger Adams. All five of the Illinois graduates had been able to return to responsible

positions, teaching and research posts, following the Cultural Revolution. Their talk of the University of Illinois was a heartwarming experience. The food was delicious and too much. I felt I was being introduced to a Chinese hospitality custom because Ming-Chien complained that the dinner was meager and that there was not enough food. My gift of 15 volumes of "Organic Reaction Mechanisms" for the Institute on behalf of Ming-Chien had not yet arrived, but it did so shortly after I returned to Urbana. Ming-Chien expressed the desire to meet President Ikenberry, and we found a window of time in which that could be accomplished, complete with an exchange of gifts. It was an important meeting for both of them.

Nell suggested that when I was in Shanghai, I might try to find the house in which she had lived during the first five years of her life. Her Dutch father had been a banker in Shanghai, and they had lived in what was then designated as the French Quarter of the city. She had a remarkable recollection as to its location and appearance. I had equally remarkable luck in being able to find it, converted—as it was in 1984—to a multiple dwelling. Her memories of a happy early childhood there were mainly of smells and sounds, colors and food, some of which I presumed to be experiencing on her behalf.

Five of the ten professors of our U. of I. delegation were of Chinese origin, which meant that we were treated to more penetrating experiences than we could have realized in their absence. In one of the museums we visited, I chanced to find one of the other delegates, David Liu, in concentrated reverie, almost transfixed, with a beatific smile on his face. After I saw that he was relaxing a bit, I asked him politely whether he could tell me what had happened. He replied that he was seeing the original of his favorite poem for the first time. The characters were chiseled smoothly into a black stone, possibly marble. After David had answered a series of naive questions on my part, I could conclude that it was the whole slab that satisfied so deeply, not one but all of the characters, their arrangement, the sweeping strokes in *three* dimensions comprising each one, the combined visual effect, and the sounds imagined from the sequence of signs. David was giving me a peek at a new world. In our language, the "original" version by a poet/artist would not be much different from any later version unless the poet's handwriting evoked some emotion, and there would be no three-dimensionality to our letters. I was learning about the combination of poetry and art for the first time. I was also able to appreciate another dimension of David's personality, beyond the expert in computer science, beyond the most humorous and agreeable companion on the trip.

On another occasion, I found my friend Bei Tse Chao, a mechanical engineer at the University of Illinois, deep in reverie in a Buddhist temple we were visiting. I stood beside him in silence, and eventually he told me what he was reading, namely that this temple had been declared a “cultural monument” of China by the Minister of Culture. The former Minister had been Bei Tse’s father, who had left China for Taiwan many years before our visit. Seeing his father’s signature had unlocked many memories. We indicated to the custodian, not a priest, that we would like to take a picture of the inscription. He told us it was forbidden to do so, and especially with flash. Bei Tse (he pronounces it “Bates”) told the custodian of his relationship to the person who had “signed” the declaration. The custodian reminded us that it was forbidden to take pictures and added that he had some business to attend to on the other side of the temple. In short, he had done his duty (twice) but had indicated that he would not be able to see us as he left our area. Bei Tse snapped the picture, and not even the flash disturbed the departing custodian. A lesson in rational accommodation?

There were many occasions while we moved about when a Chinese youngster would approach us and ask whether he could practice talking English with us. We always acquiesced, and the results were pleasant, often very amusing, experiences. In Beijing, I returned to the hotel early one afternoon and found a young boy in my room absorbed in an English lesson on the television set. I convinced him to stay until the lesson was over. He was related to one of the hotel staff, and he was benefitting from the TV in the empty room. There was obviously a shortage of television sets, together with a strong feeling that those that did exist should be used as much as possible.

The exchanges with the Academy of Sciences and with the various Chinese universities was working well mainly in the U.S. direction. At the time, there were almost 100 visitors—graduate students, postdoctorates, and faculty—from the People’s Republic of China studying at the University of Illinois. That number declined after the brutal repression of the budding democratic movement, and many of the visitors decided to stay more permanently in the U.S.A.

On another personal note, I want to report a query received from Dr. Hsing Chi-yi upon my return. He wanted to find out whether the copy of the “Poems of Tang Dynasty” that he had presented to the University of Illinois Library in 1936 on behalf of his father (the author/editor) was still there. I could confirm that it resides in the Rare Book Room, 22 volumes in 4 portfolios, and I was even able to give him the call number. He replied, “My appreciation of your thoughtfulness is beyond my power of

expression. That book can never be printed again because the wood blocks were either lost or burnt!" I was then able to inform Mr. N. F. Nash, librarian of the Rare Book Room, of the great and singular value of that collection of poems. Ming-Chien Chiang's book on physical organic chemistry, assembled from a penetrating examination of the literature available to him, won a prize in China and was also published in English. When it came time for me to dispose of many of my journals, including the decennial and quintennial indices to *Chemical Abstracts*, I found that I could send them inexpensively by "direct sack" to the Academia Sinica, where they were needed, for deposit there as gifts to Ming Chien-Chang from his old friend at the University of Illinois.

## SOVIET-AMERICAN SYMPOSIUM ON STRUCTURE AND FUNCTIONS OF NUCLEIC ACIDS, KIEV, UKRAINE, USSR

September, 1975

Alexander Rich, Professor of Biophysics at M.I.T., invited me to be part of an American team that was to participate, along with its counterpart Russian team, in a Symposium on Structure and Functions of Nucleic Acids. All of our expenses were to be paid by the National Academy of Sciences for the meeting that was to be held in Kiev, capital of the Ukraine. The invitation was hard to resist, and I had not been in the Soviet Union since before the war, the summer of 1939 to be exact.

Most of us assembled in New York for the flights from Kennedy Airport to Copenhagen and then on to Moscow. I sat next to Alex, and we talked during our waking hours about tRNA structure and function, on which subject he was the leading authority. When we arrived in Moscow, our passage through passport and customs was expedited by Russian scientists who had been delegated to serve as our hosts and guides. I didn't catch the name of my host as he whisked me through luggage retrieval and customs, so he repeated it: Alexander Kost. In articles starting in 1972 and later, I had referred to the work of Kochetkov, Shibaev, and Kost, published in 1971. In a sense, our research was in competition with the Moscow group, but it can be more accurately described as parallel. I was delighted to meet him, and, of course, we started immediately to compare notes on our findings. My research group of Jorge Barrio and Jack Sechrist had been stressing the fluorescence properties of a series of etheno-bridged compounds relevant to biochemistry, whereas the Moscow group had been concentrating on the synthesis of simple members of the series. It was

the opinion of Jorge and Jack that the Kotchekov, *et al.*, team had not recognized the fluorescence properties. That, indeed, turned out to be the case, as indicated by the answer to the first question I put to Alexander Kost. I was pleased with his answer because we had initiated patent applications from Illinois that were based on the value of the fluorescence properties of the etheno-bridged compounds. Subsequent publications from many laboratories have continued to show their value as fluorescent probes of enzyme-coenzyme interactions, coenzyme-protein interactions, and systemic detection of carcinogens, *inter alia*.

Dr. Kost informed me that he had a car and driver available for a few hours to show me the Moscow of 1975, including the Kremlin. This was also recognized as a special treat by Jack Strominger, who had published with me in 1970 when he was at Wisconsin, and had recently moved to Harvard, and he decided to join us. We covered a lot of ground and a lot of history in two hours, but then Kost had to give up the car and driver while Jack and I had to rest. The only other thing I remember about the brief stay in Moscow was the official welcome and a lunch (or "dinner") in my hotel with Professor Yuri Berlin of the Shemyakin Institute of Bioorganic Chemistry, Russian Academy of Sciences. I had known Yuri from a Gordon Research Conference and a National Meeting of the American Chemical Society in Chicago, both of which he attended while working as a visiting scientist in the laboratory of Nobelist Har Gobind Khorana at M.I.T. We had found pleasure in each other's company—he has an ironic sense of humor and a fine mind—and that was to continue in Kiev and in later meetings, including a visit he made to Snowmass Village that I spoke about when I discussed our vacation house.

We traveled by train from Moscow to Kiev. Passage through the Moscow Railway Station was an experience in itself. It looked as though a large cross-section of Moscovites had been waiting, perhaps for days, to take a train somewhere. We were shepherded through the chaos to board our overnight express and find berths, more or less by a random process that was inattentive to sex. I failed to convince either of the unattached female professors that I was a safe-and-sane grandfather, so I shared a compartment with Charlie Cantor, who at that time was at Columbia University. The sleeping car attendant brought us hot tea prepared in the samovar at the end of the sleeper, as is the custom at night and in the morning, and we fell asleep practicing Russian phrases on each other. During the week that followed, the usage of an appropriate (or inappropriate) Russian phrase now and then brought a smile and usually accomplished its purpose. Since I had practiced the travel phraseology in 1939, had studied Russian in an evening course at Illinois in 1944, and

had sung Russian songs in recitals, it was a pleasure to try my almost forgotten skills again. I must say that at this writing, they are now wholly forgotten.

Upon arrival at Kiev, we were trundled to our hotel, allowed some relaxation, and then brought together for a reception at the conference center. It was a period for sorting out people and meeting our "opposite numbers." I asked if E. I. Budowsky of the Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, was in the Soviet group. Indeed, he was. He was interested in the chemical modification and spectroscopic identification of nucleic acid bases, and I was interested in the fluorescent modification of nucleic acid bases, so we immediately had research interests in common and soon became friends. His wife, also a bioorganic chemist, was from Alma-Ata in Kazakhstan. We met other Russian scientists who were already known to us by their published work, and we tried to mix up the two teams as much as possible in discussion groups, at receptions, and during meals. The lectures, whether in Russian or English, were translated instantaneously. One only had to switch to the desired language on the earphones provided. The people who do this must find it difficult when everyday language is being used. Now, add the complication of chemical, biochemical, and medical terminology. I talked at length to one of these technically-trained instantaneous translators to try to find out how he mastered this fascinating process. He had had hours of schooling. He said that there is not time to think very much. One language comes into the ears and the other comes out of the mouth. The person I talked to was already a molecular biologist; accordingly, he had the terminology in hand in both languages, based on his normal scientific reading and his background. He had become interested in the psychology and physiology of instantaneous translation and had therefore added this dimension to his abilities. He said that the translators became mentally tired after 30 or 40 minutes and had to be replaced, he among them. When it was my turn to lecture, I started with a few phrases in Russian, only to receive the words in English since my earphones were set to English. I had to remove the earphones, and I tried no more Russian since the purpose was lost.

During the week, there were excellent lectures and lively discussions. The special occasions included tours of the city—a museum, the main cathedral of Kiev, and a small Orthodox church where the original frescoes were being restored; a ballet; a night club; some violin playing; and, on Friday night, a huge banquet. The feast was unique in my experience because of the array of bottles on all the tables—vodka, wine, champagne, and liqueur. There were innumerable toasts, and the drinks were consumed

rapidly in no particular order. The rapid consumption led to the disappearance of some of our Russian colleagues. I did not partake, despite the “bottoms-up” urging of several of my Russian table partners, because my lecture was scheduled for Saturday morning. The audience was diminished in number for my early morning lecture, but I did not mind because my good friends were there. I tried an experiment that I had tested on my graduate students at Illinois. In one section of the talk, I asked for the slides to be shown as quickly as possible while the audience was supposed to focus on an atom-group that remained invariant in position. They were supposed, then, to recognize the movement required of the rest of the molecule of a tRNA while it underwent a photoconversion from the geometry of the initial substance to that of the final product—an attempt at a slow-motion movie of the structure change. I have never published this particular sequence because it would require a kind of animated movie strip. I enjoyed the presentation myself because it had novelty, even though the effect might have been lost on those of my audience who were the more diligent participants in the Friday night banquet.

The Russians wished to reward us for our participation and thus treated us to a trip to Central Asia. Back to Moscow by air, we boarded a large Tupolov jet after claiming our luggage at the bottom of the ladder. Their system was that left or forgotten luggage simply remained on the tarmac. The seating was random, but a few of us quickly learned that the softer seats were in the front of the plane. Our thinking was that when the huge jet was used internationally, seats in the forward section would be sold as first class and would therefore be softer and roomier. We did not advertise our finding once we had established its verity. The flight to Tashkent in Uzbekistan was swift and noisy, and a kind of breakfast was served at an early hour. We were deposited in the airport before anything opened, and we remained there until we could be taken to a hotel, where we rested. We were unabashed tourists in Tashkent, a city that had undergone a devastating earthquake in recent memory and had been rebuilt. Some of the ancient buildings remained, such as a small, well-proportioned mosque, the decoration of which was achieved in the intricate and varied brick work and inscribed blue tile. I recall being impressed by the courtyards that appeared behind high walls. They invariably contained fountains. Just the spraying water had the effect of cooling and soothing one in an incredibly hot climate. Only Sheherazade was missing!

When we were not being escorted around Tashkent by bus, we took to the streets and enjoyed individual exploration. On one occasion, we came upon a square that was rimmed with large, low, sturdy tables covered with

oriental rugs. The local residents were sitting cross-legged at chess boards, both players and observers. Three or four of us together moved about the square showing interest in the proceedings. One chess group invited us to climb aboard, which we did after taking off our shoes. The players were just completing a game, so they invited one of us to play. Charlie Cantor was our "volunteer." When it became obvious to the Uzbeks that he was not exactly a novice, two of them moved around to his side of the board to be his support team. I regarded it as a hospitable graduation from "Uzbeks" and "strangers" to "dedicated chess players." Shortly thereafter, one of Charlie's supporters placed a hand lightly on Charlie's arm when it appeared that he was about to make a disadvantageous move. Charlie nodded appreciatively when he reassessed the situation, and his opponent did not seem to mind the cooperative play. Suddenly, hot tea appeared all around, and play continued. A Russian-speaking policeman approached our table and muttered something about fraternization, which I caught, but the Uzbeks dismissed the complaint jovially and sent him away with a glass of tea. As I remember, the chess game ended in a draw, which produced grins and handshakes all around. We were very proud of Charlie and amused that the language of chess had been the basis of new friendships.

We flew in a small plane from Tashkent to Bukhara, site of the 12<sup>th</sup> century emirate of Western Asia, and we reveled in new sightseeing experiences. It was truly an "I have to pinch myself" occasion. The younger members of our American group of scientists were becoming restless, however. This change had already become evident upon arrival at the Bukhara airport, where some wanted to take photos of the parked aircraft, including an ancient biplane. Their purpose was innocuous, but the prohibition against photography at the airport was a reality. I took it upon myself to restrain the picture-taking on the basis of the harm one individual photographer could do to all of us on the tour if he violated the rules of simple hospitality. I had to intervene again in Bukhara. We had been slated to include Samarkand in our itinerary. Samarkand was the seat of power in the Turkic conqueror Tamerlane (1336-1405) and was a highly desirable locality to visit. However, we were denied the opportunity of traveling from Bukhara to Samarkand by ground transportation by Soviet Security, and the person who might have reversed the Intourist order was away from his office for the weekend. Accordingly, we had to stay in Bukhara. There was serious agitation, almost open revolt, and proposed solutions that were really not viable. Cooler heads prevailed. We presented a possible scenario of Russian visitors in the United States who might be denied travel through some rocket proving ground. I think that a tardy group of Hungarian visitors, whom we encountered in Bukhara, had usurped

our possible airline reservations to Samarkand, if not our hotel reservations there, but I have not found any colleague who would confirm this idea. In any case, everyone made use of the extra day or so in Bukhara.

My colleague Olke Uhlenbeck and I broke off from the touring group by the simple device of being late for a bus departure time. We wandered the curving little walled roads in the old section of Bukhara, peeking into the little courtyards of the houses—grass, flowers, small fruit trees, tethered goats—and viewing the mosques and life by the fountains in the small square. We mingled in the small markets and sampled the shish kebobs made from lamb, the nuts, and a wonderful melon. We had this melon, which I opened and sliced with my Swiss Army knife, beside a fountain, sitting on the right side to be in its spray. This tactic helped us to stay cool. The high walls usually provided shade on one side or the other of the narrow roadways because of the curvatures. In early times the curves provided some protection against strangers or enemies, as did the maze of connecting ways. Olke and I prevented ourselves from becoming totally lost by climbing occasionally to the top of an old madrasah, some of which were being reconstructed and some of which were simply abandoned, open concrete structures. From the top we would site in the direction of a mosque or a fountain and would figure the patterns of walkways that would take us to the next objective. This was also the means we used to navigate ourselves back to the familiar landmarks near our hotel. We were very smug about our enterprise. Our reappearance at the hotel mollified our Intourist guide, who would otherwise have had to report that she did not know the whereabouts of two of her Americans who were supposed to have been on the bus.

We were to fly from Bukhara back to Tashkent for connection with the large jet that would take us to Moscow. We had to wait in the small Bukhara airport. The waiting area was actually a grassy garden under plane trees, the branches of which had been trained and cut so as to provide shade. There were no refreshments available for those awaiting an aircraft, but bottles of alcoholic beverages could be purchased in the adjacent airport store. This source was soon discovered by my fellow travelers, and in a short time there was an ample supply of Russian champagne (not bad!) available for the group, now a relaxed bunch of biochemists and molecular biologists drinking from the bottles and passing them around. I realized I had a solution to correct this not-very-attractive or appropriate scene, so I produced from my carry-on a nest of beakers which I distributed and thereby civilized the drinking scene. My friends were grateful and appreciative, but they were even more amazed. The nickel cups, about 70 ml in size, were gold-plated inside and thus were both attractive and

useful. In legend, as I understand it, they have become silver, gold-plated inside or else gold-plated outside as well. Their heavy use continued on the plane, benefitted by the somewhat relaxed customs of the Russian airline, Aeroflot. Between Bukhara and Tashkent, there was a tantalizing stop at Samarkand, but there was hardly time to savor any of its famous sites. In Tashkent, we boarded a big jet for Moscow. I remember serving as an invited buffer for David Baltimore, who occupied a window seat. We slept while most of the young scientists kept up their animated discussions through the time zones.

Upon arrival in Moscow, we were greeted by the members of the Russian group who had been with us in Kiev, but had not participated in the Central Asian jaunt. It was like a meeting of old friends at any airport; it is a pleasant, humane practice. In Moscow, there was a short stay, with speeches, receptions, and a closure to the conference. I seem to recall a side visit to Leningrad and a look at the Hermitage, but my enthusiasm was winding down, and I was anxious to return home. I was part of a group that flew via Swissair out of Moscow to Zürich as the first leg of the journey to the U.S. When we were airborne, my companions were toasting me in Scotch, following a sentimental distribution of the handy "silver" beakers. I have talked with Olke Uhlenbeck, David Baltimore and Alex Rich to make sure that I have some of these facts—or memories—straight. We all reminisced that the 1975 experience had been a very special one—and apparently a memorable one in every sense of the word.

## **BÜRGENSTOCK STEREOCHEMISTRY CONFERENCE, SWITZERLAND**

**April 26—May 2, 1981**

My good friend, Professor Jean Mathieu, who was President of the Organizing Committee for the 1981 Bürgenstock Conference on Stereochemistry, invited me to participate in the meeting and to be a speaker. Bürgenstock consists mainly of a famous resort hotel that is on a cliff, accessible from dockside on the Vierwaldstätter See by means of a large cliffside elevator. The chemists are welcomed annually at the hotel at reduced rates because the dates are in advance of the opening of the tourist season and give the staff an opportunity for a dress rehearsal of service. Founded in 1962, the Bürgenstock Conference limits attendance to 100 participants in a relaxed atmosphere. Speakers, who are never repeaters, included several of my Illinois colleagues in past

years, so I was pleased to catch up with them in 1981. Nothing is written or published, which guarantees the presentation of fresh data, and talks are limited to mornings, which leaves the afternoons free for informal discussions or recreation. In my case, the latter practice meant that I could convince Nell to accompany me. With my Swiss Railway guide in hand, I knew exactly how we should proceed: train from the Zürich airport to the Zürich main station; change to a train to Lucerne; change to a boat on the Vierwaldstätter See to the Bürgenstock landing; and ascend by elevator to a hotel level, where we were met by the hotel staff. We were very smug about our efficient transfer, and we had ample time to rest before dinner. Some of our traveling companions got lost along the way because they did not believe our directions to take the lake ferry.

The substantive part of the Conference was excellent. The appearance of Bengt Samulsson of Sweden on the program brought us up to the minute on the biological behavior of the leukotrienes. The timing was propitious since he received the Nobel Prize shortly thereafter. In protein chemistry, Kurt Wütrich of Switzerland unveiled his NMR methodology for solving three-dimensional structures of proteins both in solution and bound to lipid micelles. We are all now familiar with, and many of us are now using, the COSY and NOESY techniques, but I had the impression that most of us were hearing about them for the first time from Wütrich. Jane S. Richardson of Duke University, in a lecture that spouses were encouraged to attend, treated us to her art forms for the representation of the structures of proteins. Her imaginative pictures convey, much better than atomic models, the topology of a protein and the locus of its binding site. The computer program for converting atomic coordinate within protein chains to Richardson representations has been widely adopted and has given protein structure images a *lingua franca*. Also in protein chemistry, my Illinois Chemistry and Physics colleague Hans Frauenfelder used artistic overhead projections to remind us of the reality of quantum mechanical tunneling and to show us the movement of proteins, particularly hemoglobin, and how it accommodates to gaseous molecules at very low temperature. The timing of the invitation was fortunate for me because our research on fluorescent, dimensional probes of enzyme-coenzyme interactions had just reached the stage where we could show convincingly the flexibility of specific enzymes in their use of dimensionally altered coenzymes. It was prime time for me.

Perhaps I relaxed a bit too much after my time of speaking, but I felt it had been a good performance. I liked the program Professor Mathieu

had organized, particularly because he announced it with "These are the subjects in which organic chemists should be interested." The arrangements for meals were excellent, especially the encouraged shifting of table companions so that we were meeting and talking with different scientists and guests at each meal. The hosts, Jean and Colette Mathieu, made certain that everyone felt at home and was agreeably occupied. The salutary presence of Vlado Prelog should not be underestimated, even though he sat modestly far back in the auditorium for most of the lectures. He was his most gracious self in talking with everyone and in giving both chemists and guests plenty of opportunity to appreciate his wit, wisdom, and memorable stories. Nell tried to sit next to him as often as politely possible because he was such a delightful raconteur. He was generous with the time he spent with the two of us at the Bürgenstock Conference, and he introduced us to the remarkable Hans Erni Museum in Lucerne, to which I have returned on several occasions, also to the Museum of Transportation next door that displays model trains.

Two decades later, I recovered a picture postcard I had sent to my research group. The famous Swiss artist, Hans Erni, in his painting, "Baum der Erkenntnis," had drawn molecular models of ATP, water, fat, sugar, and protein in a bush against a Swiss mountain landscape. The card was signed by famous chemists who attended the 1981 Conference:

"Work harder still"—*Derek Barton*;

"The end of the road is nearly in sight"—*Jack Dunitz*;

"Look under the bush where the real site is hidden.  
Nevertheless, the lecture was great."—*Rolf Huigen*;

"Congratulations"—*Duilio Arigoni*;

"Best regards"—*André Dreiding, V. Prelog, Y. Kishi, W.G. Dauben, J.E. Baldwin, S.J. Cristol.*

My students were thrilled with the card and were stimulated by the words of approbation of their work.

Nell and I flew back from Zürich to Amsterdam for a visit with the Dutch relatives. Nell prolonged her stay in Holland while I flew to London to visit Leslie and Kitty Strang; then, we were joined by Nell, who had to fly into Birmingham because of a strike affecting the flights into Heathrow Airport, and we four drove up to the Lake District. In Grasmere, I kept busy attending and speaking at the annually-held Conference on Heterocyclic Chemistry while the other three enjoyed themselves touring

about the Lake District. There were some opportunities for hikes all together and for shopping, e.g., for the sheepskins that are now in the South House in Dunewood and for the "Winnie the Pooh" books which are now with Marcia. The year 1981 was a banner year for trips and lectures. On arriving home, we went to the University of California, San Diego, for one week, where I was the Calbiochem Lecturer. I gave three lectures during the week, and we attended one banquet, where I had to give an after-dinner talk. The occasion was rather special for me because two of my Columbia University professors had moved from Columbia to Chicago, and thence to San Diego. One of them, Joseph Mayer, was among the people attending the dinner, and the widow of Harold Urey was also there. During the week, David and Alice Kearns were our hosts. It started with our being picked up at the airport in their Bentley (reconstructed by David) and ended with a relaxing dinner finale at their home with their children. In June of 1981, we went to Vanderbilt University in Nashville to attend the biennial Organic Chemistry Symposium of the American Chemical Society at which I was awarded the Roger Adams Medal. I have described the organic chemistry symposia in another section.

## AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS

**New Orleans, Louisiana, April 1982**

In 1981, I was invited by Professor M. J. Coon of the University of Michigan Medical School to arrange and chair a minisymposium at the 1982 Spring Meeting of the American Society of Biological Chemists, of which he was the Secretary. Jud Coon had been a graduate student in Biochemistry at the University of Illinois and was a friend, so the request was not unusual. What was unusual was the fact that I was being recognized as a biochemist and as a plant biochemist as well, and I appreciated that. With a little help and guidance from colleagues, I managed to put together a program on "Plant Biochemistry: Hormones and Growth Control." All of my invitees accepted despite the fact that I could offer them no honorarium or travel expenses. My friend Paul Stumpf of the University of California, Davis, was chair of a related minisymposium on the previous afternoon of the meeting on "Plant Cell Compartments." Accordingly, there was a body of material on the plant subdiscipline of biochemistry sufficient to interest the plant scientists and was also intended to attract the less-affiliated biochemists.

By way of introduction to my minisymposium, I offered a relevant quotation from Professor Kenneth Thiman of the University of California, Santa Cruz:

“It is worthwhile to remind ourselves that plants form the background of our civilization—both the plants that we grow and those of spontaneous presence. It was our ancestors’ discovery that certain wild plants could be grown from seed, harvested, and eaten, that led them to abandon their wanderings and settle down in what we could now call a farming community. It was the productivity of those plants that enabled some of the men or women to turn their attention away from the endless getting of food, and the making of tools and weapons for gaining it, to the development of cultural pursuits. Whatever we can learn about plants and their growth is closely related to our fundamental needs for food and fiber, to the history of the human race, and to our plans for the future.”

**Shang Fa Yang** of the University of California, Davis, talked about ethylene, the hormone that initiates fruit ripening and regulates many aspects of growth and development. I have always been his strong supporter in an area that he has enriched by his originality and perseverance, which qualities allowed him to remain unruffled by the surprise after surprise that Nature provided in this field. I was touched when, at a recent international meeting he approached me to say that he recognized my role behind some of the improvements in his career and to thank me. I must say that I played no role in his most recent advancement to Professor in the Department of Biology of the new Hong Kong University of Science and Technology in Kowloon. His presence and his teaching in China will give him a broader horizon for improving the growing and ripening of fruit crops.

**Charles A. West** of the Department of Chemistry and Biochemistry at the University of California, Los Angeles, was a Ph.D. graduate of the University of Illinois. Although he is an expert in gibberellins, hormones that produce stalk elongation, he examined in his lecture the subject of pectic cell-wall fragments as regulatory agents in higher plants, which served as a liaison to the other minisymposium.

**John W. Einset** of the University of California, **Roy O. Morris** of Oregon State University, and **Norimoto Murai** of the University of Wisconsin, Madison, talked about different phases of the behavior of *Agrobacterium*

*tumefaciens*, a plant pathogen that causes crown gall disease but can be used in a positive way through its production of plasmids. Magnification and modification of plasmid production together hold the key to genetic engineering applications, including the introduction of foreign genes, in plant tissue culture. Commercial practice has now caught up with the fundamental research that was being described in 1982 and that depends upon abnormal levels of auxin and cytokinins. **Robert Bandurski** of Michigan State University developed further the theme of auxin and its conjugates.

There was eager questioning of the speakers, but the attendance at the symposium was disappointing—and visibly so because we had been assigned too large a room. A different title, one that reflected the future, something like “Genetic Engineering Applied to Plant Material,” might have attracted a larger audience. It has been my frequent observation that new discoveries take time to be recognized, and applications resulting from such discoveries taken even longer time. The visit to New Orleans served another purpose. I had a long and satisfactory session at the Department of Biochemistry, Louisiana State Medical Center, for discussion of my research collaboration (and publications) with Professor Robert Roskoski, Jr., and his colleagues, F. Thomas Hartl and Deepak Bhatnager.

## CHEMISTRY AS A LIFE SCIENCE SYMPOSIUM

Rutgers, The State University of New Jersey, Newark  
March, 1984

I see myself changing over time as I write about the symposia that have been important in my professional life. I hope any casual reader will be tolerant of me and of my self-absorption during the process. At the beginning, I was writing about the influence of the symposia, the attendees, and their chemistry upon me. With advancing age, I seem to be writing about my influence on the symposia, if any. I am even so anxious to preserve my words of “deathless prose” that I am taking to inserting them into my descriptions of the symposia of the 80s rather than assigning them to postscripted speeches that might have less chance of being read. This symposium in 1984 was excellent and was memorable because of the mutual influence between the speakers and the chairman or moderator. Since Newark, New Jersey—at least the Presbyterian Hospital there—was my birthplace, there was some reference to the return of a native. I was, in fact, the Symposium Moderator, and this is what I said in

introducing the second biennial conference on "Chemistry as a Life Science" (in 10 minutes):

"The titular words are well chosen. Actually, the programs of these biennial conferences should be kept by the attendees in order to follow where chemistry in this context is going. The idea of ours being a life science is a bit foreign to those not trained in chemistry. For example, when the Westheimer Report was being written for the National Research Council/American Chemical Society, we found that the National Institutes of Health did not admit to a budget for "chemistry" as such, an anomaly in the context of cyanogen bromide having been invented by N.I.H.'s Bernard Witkop as a primary reagent for the determination of all protein structures.

"All biological processes can eventually be understood only at a molecular level. The only questions are: when, where, and at what stages does the chemist wish to become associated with seeking such understanding. From the other side, when does the biologist become satisfied only at the molecular level? Or the physicist? Curiosity must be kindled, and there must be enough basic knowledge in hand that the curiosity can lead to useful action. I tell my own students that chemistry alone is not enough. I hope that, as chemists, we do not become scholastics. One must teach oneself enough of an adjacent life science that worthwhile chemical questions can be asked; then experiments must be done! The speakers today will tell you how they did them.

"Never before have I had the pleasure of chairing a program featuring such exciting speakers. My title today is 'moderator,' but I shall try in no way to moderate the speakers' enthusiasm, only their time. Nor has such a group of speakers had a more distinguished audience of chemists enthusiastic about their life science! Each of the speakers brings us breadth of knowledge and descriptions of ingenious ideas and experiments that have altered the way life science is to be done."

**Professor Alan R. Battersby** of the University of Cambridge spoke on the "Biosynthesis of the Pigments of Life." I first met Alan when he was

a Commonwealth Fund Fellow at the University of Illinois during 1951-1952, following a year spent at the Rockefeller Institute, now the Rockefeller University. In 1983, Nell and I had helped serve as his hosts in Bozeman, Montana, at the National Organic Chemistry Symposium where he received the Roger Adams Award. Several years ago, he was knighted for his brilliant research, especially on the pigments of life: heme, the cytochromes, the chlorophylls, and vitamin B<sub>12</sub>, and on his public service in the U.K. I could point out that he was really a fisherman and a sailor who had learned his botany and biology well.

**Professor Robert E. Ireland** of the California Institute of Technology, spoke on "The Synthesis of Ionophore Antibiotics." I first met Bob when he was at the University of Michigan and I was on a lecture tour that included Ann Arbor. In 1965, the Chemistry Department at the University of Michigan seemed interested in bringing me to the campus as their new Chairman. Bob was certainly one member of the staff who would make it attractive to consider such an association. However, a fortuitous, frank, curbside conversation (we were actually sitting on the curb at the end of an informal interview day while awaiting a ride to dinner) revealed that he was about to leave Michigan for Caltech. I myself did not manage to make it to Caltech until 1991! Bob was originally a student of English literature, and his chemical writing benefitted from that background. He had moved from the synthesis of plant natural products, based upon his knowledge of botany and his artistry in organic synthesis, to the total synthesis of antibiotics. I could point out that he was also an effective racehorse handicapper and a wine connoisseur.

**Christopher T. Walsh's** talk was on "Mechanistic Studies on Bacterial Amino Acid Racemases." He was then Head of the Chemistry Department at the Massachusetts Institute of Technology and a Professor of both Chemistry and Biology. His breadth of knowledge included biology and biochemistry, but when he had been an undergraduate at Harvard University, he had taken all of the graduate courses offered in chemistry. Our paths had crossed when he was obtaining a Ph.D. degree in Life Sciences at Rockefeller University during 1965-1970 and I spent a month there (in 1968) on sabbatical leave from Illinois. I could point out that he was really a skier, which he had become as a stipulation of the lady he was to marry. She is the present (as of 1998) President of Wellesley College. Chris was one of the N.J. Leonard Distinguished Lecturers (1989) at the University of Illinois and is now on the faculty of Biochemistry in the Medical School of Harvard.

The intriguing title of **Dr. Christopher Cimarusti's** talk was "Monobactams: From the Pine Barrens to Aztreonam and Beyond." He

was the product of an NIH-sponsored program at Providence College designed to foster careers in medical research. He obtained his Ph.D. degree in organic chemistry and did postdoctoral work at Columbia University, which was the only location that allowed me to state that we had similar educational stops during our careers. A past Director of Organic Chemistry in the Squibb Institute for Medical Research, from 1981 he became Director of Chemical Development. Dr. Cimarusti played a major role in the programs that led to two commercial drugs, one for the heart and the other an antibiotic of an entirely new class.

**Professor Peter B. Dervan** of the California Institute of Technology had lectured on 1,4-biradicals and 1,4-diazenes at Illinois during an earlier lecture sweep across the country. His brilliance and enthusiasm had been appreciated, but it was really in this new area of research, indicated by his title, "Design of Sequence Specific DNA Cleaving Molecules," at our symposium, that those characteristics were having, or were going to have, a profound effect relevant to the life sciences. One of the problems holding up the determination of the structures, mainly the sequences, of nucleic acids was initial cleavage of these huge molecules into smaller sections. Peter's first contribution was to develop reagents for *random*-sequence single-strand DNA cleavage. His first results were considered negative because his reagents gave mixtures of products. However, they became positive when subjected to statistical analysis and recognition that the several-fold products of overlapping sequence were helpful in structural assignment. His "foot-printing" method became very useful and was widely adopted in short order. From this initial determination, he moved on to uncover reagents that would effect sequence-*specific* DNA modification. On the personal side, I could inform the audience that Peter was really a golfer and a reformed skydiver. At this writing, he is my "boss," as Chairman of the Division of Chemistry and Chemical Engineering at Caltech.

## SIXTH EUROPEAN SYMPOSIUM ON ORGANIC CHEMISTRY

Belgrade, Yugoslavia, September, 1989

An invitation to speak at this European Symposium in Belgrade gave me the first opportunity to visit Yugoslavia. I gave as the title of my seminar: "Synthetic Organic Possibilities for Interference with DNA Synthesis and Replication." In the summer prior to symposium, my responsibility was increased to chair a session that included the Plenary

Lecture of Dr. A. J. (Tony) Kirby on "Structure and Reactivity in Intermolecular and Enzymic Catalysis." At that time, he was a Reader in Organic Chemistry at the University of Cambridge and Chairman of the Organic Reaction Mechanisms Group of the Royal Society of Chemistry. In my introduction, I could state that he had designed structures to test theory in a very elegant manner. He is an expert in stereoelectronics. I suggested that if those in the audience wished to become expert, all they would have to do was to read Tony's book on the subject. We had a number of things in common. First, we had a strong commitment to Continental Europe because we both had had the good fortune to marry ladies from the Netherlands. Second, I had been his introductory chairman once before, in Burzenin, Poland. Third, he had just been invited to give the Voorhees Lecture at my own University of Illinois in the spring of 1990. Tony "collects" countries. Yugoslavia was the eighteenth country in which he had been asked to lecture.

At the meeting, my responsibility was increased further due to the fact that one or two of the invited participants in the Round table Discussion on "Organic and Bioorganic Chemistry—Past, Present, and Future" had not appeared. Asked to substitute, I agreed to provide a 5-10 minute introduction prior to the general discussion. It went this way:

"Perhaps I have overdone the advice I have given to my students that 'Organic Chemistry is not enough.' They have reacted to my words in many different ways. Some have become practitioners of biochemistry and some have landed in the intermediate area of bioorganic chemistry, which can have many definitions. The famous chemists of the last end of this century investigated the structures of biologically active natural compounds—alkaloids, vitamins, hormones—and laid the basis for biochemistry. Hence, bioorganic chemistry is old in terms of practice although general application of the name is new.

"The first IUPAC-sponsored Symposium on Bioorganic Chemistry was held four years ago in New York, and we are now in the process of trying to organize the next one. We are late in doing so. Many other international organic symposia now include one day devoted to bioorganic chemistry. We have already adopted the methods of biochemistry and molecular biology. It is becoming usual

to hear organic chemists talk of gels, electrophoresis, sequences, DNA splicing, machine synthesis of polypeptides and polydeoxynucleotides, cloning, hybridization, etc.—even genetics.

“The name ‘Bioorganic Chemistry’ was already used to indicate a discipline and an area-coverage for one and one-half generations in the existence of the Institute of Bioorganic Chemistry within the Soviet Academy of Science, further designated as the Shemyakin Institute of Bioorganic Chemistry. Organic chemists really have an advantage in doing bioorganic chemistry. They bring to the area the rigors of their discipline: standards of purity, proof of structure, familiarity with all forms of spectroscopy, extraction and isolation procedures, reaction mechanisms and kinetics, energy calculations and computer modeling, and, above all, synthetic experience. An organic chemist can keep ahead in the game by the synthesis of compounds not available commercially, coupled with a willingness to use an enzyme, yeast, or bacterium as a reagent to effect conversions.

“What is the formula for doing bioorganic chemistry? It is different for each individual. The Round Table speakers were asked by the chairman to focus on their personal experiences. My change of focus started in 1960, when I was on sabbatical leave at the University of Basel. I started reading less organic chemistry literature and substituted biochemistry and plant physiology. In the meantime, my students at the University of Illinois initiated work on cytokinins, compounds that induce plant cell division and cell differentiation, and on possible natural precursors of cytokinins, e.g., a naturally occurring 3-substituted adenine derivative that produces an N<sup>6</sup> substituted adenine product upon autoclaving. We followed structure/activity relationships, and we searched successfully among tRNAs for cytokinin-active components. From 3-substituted adenines, it was a natural step to include 3-isoadenosine and then 3-iso-ATP in our studies, the latter as a spatial probe of enzyme-coenzyme binding. A deficiency of 3-isoadenosine was overcome by making fluorescent probes,

c.g., etheno-ATP, and then dimensional fluorescent probes that examined the space necessary for an ATP-like compound to be biologically active. From there it was a short step to devise a fluorescent compound that mimicked a covalently-linked A-U base pair in a double-stranded nucleic acid. My shift in research interest brought an appointment as Professor of Biochemistry in addition to that in Chemistry.”

This saga did stimulate questions and discussions from the audience, as did the statements of the other members of the Round Table. One unexpected, pleasant result of the session was that the organizers of the Symposium decided to pay the hotel bills of the substitute members of the Round Table. Volunteering, surprisingly, may have hidden benefits! In the afternoon following the Round Table, all the participants were treated to a tour of this old city, in its setting at the confluence of the Sava and the Danube Rivers.

One of my early (1949) Ph.D. students, Joe Boyer, attended the Symposium and had signed up for the same post-symposium excursion that I had, one that went by luxury bus through the heart of Yugoslavia. The tragedy of the 90s has been that it was just this “heart” which was destroyed by the Serbian militarists, but in the final year of the 80s, it was a beautiful place to see and Yugoslavia was still an entity. During our first day, we drove through Serbian landscape to Šabac, to medieval Zvornik with its impressive fortress, and on to Sarajevo, where we stayed in the hotel that had been headquarters for the Winter Olympics. It was also the city where World War I started, and it was a meeting point of Eastern and Western civilizations. The Serbs were later to subject Sarajevo to destructive shelling. I was to see on television and with great sadness the images of the cruelest war where, in 1989, there was peaceful coexistence of the Serbs and Croats. The contrast for me is especially sad when I consider Mostar. When we visited the picturesque old Turkish town that was famous for its 16<sup>th</sup> century stone bridge, I was impressed by the sights from the bridge. They included a mosque, an Eastern Orthodox church, a Roman Catholic church, and a synagogue, all within view. My 1989 philosophic reveries on unity and tolerance proved to be just that, a daydream, when the Serbs later bombed the medieval bridge. We continued down the steep and deep Neretva canyon to the shore and on to Dubrovnik, Europe’s most beautifully preserved medieval city. Walking tours of the old town, the cathedral, and the

waterfront, plus excursions along the coast, were capped by swimming in the Adriatic's warm, clear water. I had one of my "Pinch me, I'm alive" experiences as I floated in the Adriatic and watched the sun set over my toes. All images were lost when the Yugoslav destroyers wantonly shelled Dubrovnik as punishment for the secession of Croatia. The preservation of historical and beautiful Dubrovnik at that moment had been a mission of the UN's cultural branch. Now, it is in an era of reconstruction, and visitors are again returning to its remarkable sights and favored beaches.

From Dubrovnik, I flew to Ljubljana, the capital of Slovenia, at that time Yugoslavia's northernmost province and now a separate country. I lectured at E. Kardelj University and was hosted by my friends: Andrej Petrič, who had been a postdoctorate in my group; B. Stanovnik, who had been on the program with me in Belgrade; and Miha Tišler, who had been a postdoctorate with Roger Adams during my time in Illinois. There is much to see around Ljubljana, and I was well and thoughtfully guided: Postojna Caves, which constituted my first visit to a huge underground cavern; Bled Castle, Lake Bled, and the high plain above Lake Bled; a trip to Lake Behinj, the ski resorts, and a high waterfall; and the city itself. We had great meals together, of great variety. When Slovenia seceded from Yugoslavia, because it was separated from Serbia by all of Croatia, the Serbs could only threaten from the air. It was during those nerve-wracking fly-overs that I decided to help Andrej Petrič return to the United States. This I could do with the financial assistance (with another postdoctorate post) of Jorge Barrio, whom I had rescued from a dangerous political situation in Argentina. They are continuing in fruitful collaborative research that includes regular visits between California and Slovenia.

I flew from Ljubljana to Zürich for a visit with Professor Vlado Prelog and the benefit of a new infusion of his wit and wisdom. My last infusion had been five years earlier. The visit allowed me to talk to all of the ETH colleagues and to be included in the 60th birthday luncheon of one of them, which lasted three hours. A special expedition to Germany had been mounted for obtaining the proper wine for the occasion, a 1985 Würzburger Stein Albalonga Beerenauslese. I was awarded one of the labels. Prelog then took me to the Zürich museum to see a retrospective Salvador Dali exhibit and the Ruzicka collection. A fine walk and dinner completed this brief Swiss sojourn. I returned to the University of Illinois and then to Bethesda, Maryland, to be a Fogarty Scholar-in-Residence at the National Institutes of Health.

## NOYES LAB CENTENNIAL CELEBRATION

*SIGNAL TO NOYES:  
THE VOICES I STILL HEAR*

In autumn of 1907, **William Albert Noyes** was brought to this campus as Professor of Chemistry and Director of the Chemical Laboratory. The building is named after him because he brought the first touch of greatness to that discipline on the University of Illinois campus. Noyes was 50 years old. He had a background in teaching (Minnesota, Tennessee, and Rose Poly) and in government work (the National Bureau of Standards). He was an internationalist, having lived in Munich (1889) and having been a member of the Chemische Gesellschaft and the Société de Chimie Industrielle, and he was an editor (the American Chemical Society *Journal*, *Chemical Abstracts*, *Chemical Monographs*, and *Chemical Reviews*).

I do not go back that far, but sometime after I had come to Urbana, Illinois, unauspiciously in 1942, I was assigned space in the prior office/laboratory of W. A. Noyes in the northwest corner of the first floor. His samples of camphor and camphoric acid were still there in the cupboard under the hood. His widow, his third wife, still lived in the family house at 1105 Nevada Street, and that is where Lennie Miller and his beginning family first lived as renter-custodians. Professor Fuson got along with W. A. Noyes, he said, by willingly, or perhaps blindly, signing the many petitions that were thrust in front of him. As I said, W. A. Noyes was an internationalist; he was also a “mover,” and he was blind to color. He knew the American chemical scene very well. When Roger Adams took over as Head of the Department in 1926, Adams stated his avowed purpose of improving the quality of the graduate students in Chemistry. Thus, he did not take too seriously the application of a young man at a small college in Indiana who was uncertain as to whether he wanted to be a scientist or a football coach. Noyes, however, urged Adams to offer Wendell M. Stanley a teaching assistantship because he had great faith in the Earlham professor’s recommendation of Stanley and of other applicants before him. “Take Stanley this year and then start improving the quality of the graduate students next year” was Noyes’ amusing advice to Adams. Twenty years later, Wendell Stanley shared the Nobel Prize for research on the structure of the tobacco mosaic virus. He was Illinois’ only Nobel Laureate for some time!

Much has been written about **Roger Adams**, but I simply quote from the citation of 1964 when he was awarded the National Medal of Science:

“For superb contributions [to chemistry] as a scientist, teacher, and imaginative leader in furthering the constructive interaction of academic and industrial scientists.”

I obtained approval from William Albert Noyes, Jr., to publish an 80<sup>th</sup> Birthday Greeting to Roger Adams in the *Journal of the American Chemical Society*. When I had written it, I decided to show it to Dr. Adams for correction and approval, for I knew that he liked neither surprises nor inaccuracies, and it was duly published in 1969. The definitive biography of “The Chief” was written by the Tarbells and was published in 1981.

My first writing experience with Dr. Adams took place in 1943. We met for a Sunday lunch in August at the (then) Men’s Faculty Club, and he asked me how my postdoctoral research was coming along. I told him I had completed the required alkaloid synthesis, to which he responded enthusiastically: “Write up the experimental in *JACS* style and bring it along to the house this evening.” That was not what I had originally planned to do on a Sunday afternoon, but the evening writing of the descriptive section of the article went smoothly, assisted by our consumption of a large bag of popcorn. I bargained for a little more time before submission of the article in order to establish the stereochemistry of our product, and that worked out very well within the next month. Dr. Adams had indicated what a real devotee of organic chemistry could or should do on a Sunday afternoon and evening in the summer! Later, when I was on my own as a beginning staff member, I sought advice from senior staff members to supplement my initial writing efforts. I remember well three bits of advice that I took to heart.

Harold Snyder, upon reading one of my early efforts, questioned a statement I had made: “Johnson opined that . . .” etc., etc. He said he knew Jack Johnson very well and doubted that he ever “opined” anything. Thus ended my attempt to incorporate unusual words in that paper or in other papers that followed. The message imparted was to state things simply, understandably, and in every-day language. Carl (Speed) Marvel read another of my early papers in manuscript and concluded that I was trying to prove two major points. His message was that I should compose the results in two separate papers because readers seldom remembered more than one conclusion from a single paper.

R.C. Fuson offered to criticize a review paper I had written. When I returned to his office to obtain his recommendations, I was very disappointed because he offered no substantive revisions at all, yet I knew my first attempt at reviewing all known information about a particular series of compounds could not have been that perfect. I was

about to leave when I told him that I was disappointed because I had really come to him for instructive, serious criticism. "Oh, in that case . . .," he said as he opened his desk drawer and withdrew two sheets of handwriting. Fuson indicated that my writing was like a collection of reference cards. Improvements were suggested to omit the dates (years) of publication, as well as the locations and names of the authors, with which I had started each paragraph. Instead, the subject matter was supposed to guide the ending of one paragraph and the beginning of the next, so that the article "flowed." Terminal references would disclose all the details of origin. In the rewrite, the pedantic, unimaginative collation of data was converted to a critical, adhering discussion. Fuson sometimes wrote verse under the name Robert Fox. The surname could be applied in this case of requested and reluctantly supplied advice. I followed that advice in all my later writings in which I was recounting prior scientific history. By the time I had absorbed these writing lessons, I had the temerity to rewrite a joint paper that my senior colleague Charlie Price had presented to me in first draft and on which I was supposed to be a co-author.

Whenever Roger Adams in a note or in conversation with you, started out with "it has come to my attention," you knew you might be in for a spot of trouble. My first IHCTMA referred to my impatience with certain secretaries and storeroom clerks and my voluble complaints against them. Adams pointed out to me that, as employees of the State of Illinois, they had tenure; as an assistant professor, I did not. "Was that clear?" Then, he relented and invited me to come into his office with any legitimate complaint and to pound on his desk. He said, "I have tenure, and I can do something about a staff member's deficiency." I never had to pound on his desk. When I rose (slowly, it may be added) to the status of membership of the Graduate College Faculty, I was able to accept the talented graduate students who were suddenly available in large numbers. After 13 had started to work with me, Professor Adams, in a second IHCTMA, indicated that the number seemed excessive. I believe I answered rather naively that I had several more exciting research ideas to offer to graduate students. He then pointed out the difficulties of starting such a large number at one time, of directing their work from day to day, of substituting new research ideas for those problems that would falter, of supporting so many, and of finishing off their Ph.D. degrees, including reading and correcting their theses and conducting their final exams. Additionally, Adams suggested that a more rational number of graduate students to accept in one year could be obtained by dividing the number of organic chemists entering graduate school by

the number of faculty members who could direct their research. All of that advice made good sense, and I have given it to junior colleagues whenever it seemed appropriate.

If Dr. Adams found his students engaged in a poker game in the laboratory when he visited them on a Saturday or Sunday, he would ask to sit in on the game. Invariably, the students would discover that it was wicked to gamble (and lose). When I asked permission to be away from Urbana in February, 1947, to travel to New York City to meet my fiancée, who was arriving from the Netherlands via Sweden by ship, he asked whether I had arranged for Bob Frank to do substitute lecturing for me. When I answered that I had taken care of all my teaching obligations, he responded with "You must meet your fiancée if she is indeed coming to America for the first time!" I thought I was safely on my way; however, just as I reached the door of his office, he said, "Oh, Nelson, I am chairman of the program committee of the Urbana Rotary Club this Spring. Would you be willing to sing at one of our luncheon meetings?" Yes, I was willing! It was with some poignancy that I relate his last words to me. He was terminally ill with cancer in a nursing home, and his daughter Lucile was spoon-feeding him baby food. When I came into the room, he said between spoonfuls, "Nels, I would ask you to share my lunch, but I don't think you would like it."

The business about it being wicked to gamble and lose was related to a quotation from **Carl S. Marvel**. In remembering "Speed" Marvel, we may well recall a few of his favorite sayings, but some may have become entwined with the aphorisms of Mark Twain, another man who crossed the Mississippi River. "Anyone is a fool to go into academic work. All good chemistry is done in industry. If chemistry isn't fun, it shouldn't be done. Insurance is useless due to inflation with the Democratic (or Republican) Party in power. Membership in a scientific honor society is like a pair of pants—you don't get any credit for it but you would look funny without it." His advice to a department head (Herbert E. Carter) included the following messages: "Keep committees to a minimum. They seldom create new ideas and are too often swayed by the most aggressive talker. Never take a vote until you know you have a good majority on your side. Never ask the Provost for less than you need, but always supply documentation. Don't ask for funds to do something—start doing something, even at a sacrifice, and ask for funds to continue and expand a promising activity. Know your faculty and keep track especially of the young chemists." Speed could drink the hottest coffee and consume the largest amount of popcorn. He was fond of guiding his colleagues through the Greek alphabet and of interjecting

Latin quotations. He teased us with statements of the wonderful chemistry they were doing at DuPont that he wished he could tell us about. In answer to our random complaints, he had lived through a bigger snowstorm, had had a worse graduate student (who improved dramatically) and a worse secretary (who responded to training), and always felt old (while doing the work of at least three young people). In remembrance of Speed Marvel, we smile for someone we really cared for and who cared for all of us. The lasting words that he gave me were “Remember that our major product is our students.”

The citation of 1986 when he received the National Medical of Science was:

“For leading us into the Polymer Age through his researches on polymers, including synthetic rubber; for helping us into the Space Age through his development of thermally stable polymers; for his many services to the chemical profession; and for educating and inspiring three generations of chemists.”

**Charles C. Price, III**, told me that Speed had influenced his career by saying, “If you are going to study reaction mechanisms, you might as well do so for important reactions: polymerizations.” He and his students did study addition polymerization at Illinois, especially end group analysis. His student Royston Roberts discovered a key step in the synthesis of the antimalarial Chloroquine, and I joined the Price and Snyder groups in manufacturing kilo supplies of the quinoline ring portion. During World War II, Charlie Price’s group was also engaged in the study of Sulfur and Nitrogen Mustards, which required the upgrading of the Noyes hoods. His advice to me was “Just work hard. Enjoy the chemistry you are doing. Your academic future will take care of itself.” His future was to be at Notre Dame and the University of Pennsylvania.

Charlie Price and **Harold Snyder** had spent a year together as labmates as Roger Adams’ postdoctorates. Harold assembled and maintained a group of industrious, dedicated, and loyal research students. When Harold was not at his office desk editing chapters and chapters of “Organic Reactions,” the first volume of which was published in 1942, he was likely to be found in the library or in the laboratory across the hall from his office in Noyes Laboratory. There he tried out new reactions on a test-tube scale before he assigned problems to students, especially undergraduate research students. He explained that “It is wise to generate a bit of optimism at the start of a research problem.” He inspired

his students to follow their own ideas, stressed that research was a learning experience for them, and he was always willing to take an extra step on their behalf. For me, he was tolerant (of my singing in the laboratory next to his office), generous (my wife-to-be lived with the Snyders for three months prior to our marriage), and helpful (he got me involved in "Organic Syntheses"—another first for Adams in 1920). I still recall his dry wit and his propensity for engaging in practical jokes, often well-staged and elaborate.

I mentioned earlier the review-writing advice I received from **Reynold C. Fuson** ("Bob" Fuson). He was especially effective in his precise lecturing and in his direction of the research of senior undergraduates, one of whom, Robert Holley (A.B., 1942) went on to win a Nobel Prize. His graduate students did prize-winning research on stable enols and enediols. Although Fuson had an avowed low opinion of physical chemistry and of explanations of reaction mechanisms in orbital terms, he contributed to our knowledge, with C.C. Price, of the mechanism of action of Nitrogen Mustards (OSRD work, 1944). He elicited the principle of vinylogy (1933) only slightly later than Robert Robinson's parallel description (1932) of anionoid and cationoid behavior, with its curved arrows. He was one of the participants in the determination of the structure of the German nerve gas, a sample of which had been obtained from a railroad train captured in northern Germany during the war. Bob Fuson had a great love of music, ability in speaking both Italian and Spanish, a tendency to spend part of each summer amid the art of Florence, and a facility with shorthand sufficient to speed up the typing of the many recommendation letters he had to write. He freely offered his analytical samples to me for an almost instant publication that I could then write on the ultraviolet absorption spectra of hindered benzils. When I naturally offered to place his name on the paper, he demurred, saying, "Not necessary. I am just your colleague." I spent many enjoyable evenings listening to music with Bob Fuson and Sherlock Swann.

Based on an original volume of Professor Oliver Kamm, Ralph Shriener and Bob Fuson wrote a popular textbook on qualitative organic analysis that was a marvelous teaching tool. It was improved later by David Curtin when he joined the Chemistry staff of the University of Illinois and introduced the "why" of relative reaction rates to explain the observations. Other very successful textbooks came out of Noyes Laboratory during those years. In organic chemistry, there was the classic undergraduate text by Fuson and Snyder, an advanced text by Fuson, an organic laboratory manual by Adams and Johnson (Jack Johnson of Cornell had been a former student and staff member at Illinois). Herbert

Laitinen produced a definitive volume on analytical chemistry, and Therald Moeller, one on inorganic chemistry. My enumeration will be recognized as incomplete, but omissions may be regarded as allowable within the purvey of my title, "The Voices I Still Hear." One text is associated with a ghostly voice: "Principles of Ionic Organic Reactions" by Elliot Alexander (4<sup>th</sup> printing in 1960). Elliot's very popular text had grown out of a seminar he taught for graduate students and seniors at the U. of I. The students did literature searches on chapter subjects and contributed rough drafts. These were checked and improved by Elliot, who wrote them in final form as course notes. Tragically, Elliot and his wife died in the fall of 1950 when the small plane he was piloting crashed on a mountaintop between Johnstown and State College, PA, in bad weather. I doubt that he had instrument rating because he used to talk to us about "following roads and Illinois towns from the air." Those are the words that I still hear, plus those of his mother, supported at the Connecticut graveside by Lennie Miller and myself. "Oh, dear, they have placed a second 't' on Elliot's name (in the brass lettering on the casket)."

**David Y. Curtin** returned to Illinois following his postdoctoral experience at Harvard and a few years on the chemistry staff of Columbia University. He brought refreshing innovation to teaching and research, assuring that the U. of I. had a recognized status in physical organic chemistry. The "voice" I hear, however, reverts to his graduate student days at Illinois, when one could hear him playing the flute in the organic laboratory on the second floor of Noyes, NE corner, on Sunday mornings.

Junior faculty members were generally recruited following the recommendations of professors at other institutions. In the case of **E. J. Corey**, the process evolved rather differently and was actually initiated by the statements of M.I.T. undergraduates who were coming to Illinois for their graduate work in organic chemistry. I happened to be in charge of advising first year students at the time. I would ask those from M.I.T., "Wasn't it great to be taught by Roberts, Sheehan, Cope, Swain, and Büchi?" The students' words, which I still hear, followed the general line: "They are great, but they are never around. The person who is most helpful to talk to, especially about research, either undergraduate or graduate, is one of John Sheehan's graduate students, E. J. Corey. He knows what everyone is doing in the laboratory and he always makes helpful suggestions." Corey was not the candidate suggested to Adams by Art Cope, and Adams was upset when I passed along the MIT students' unanimous opinion. In telephone conversation between Adams and Cope, the latter agreed that E. J. Corey "was the chemist most likely to succeed

in an academic career.” Indeed he was, as the later Nobel Prize and Japan Prize abundantly confirmed. Well, that changed the picture, and Adams went off to Harvard with faculty approval to hire E.J. if he liked him. He did like him and he did hire him.

E.J.’s citation for the National Medical of Science in 1988 read:

“For his strikingly original contributions to organic synthesis, which have brought the science of organic chemistry to a new level of power and precision.”

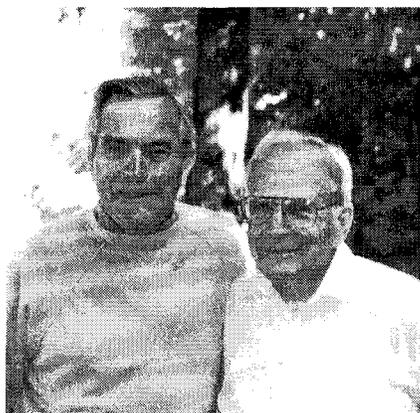
Corey’s brilliant research with seniors, graduate students, postdoctorates and colleagues from abroad attracted wide attention very rapidly. While still an assistant professor at the U. of I., he was offered a full professorship at the University of Chicago at \$12,000 a year. I polled the organic chemistry professors to get approval for our trying to match the offer. I then went to E.J. to tell him I was going to try to match. He told me that I shouldn’t take the time. That was sufficient challenge for me and for Herb Carter, then the Head, who went to bat with the Dean and with the Provost. When the equivalent counter offer was in place, I went back to Speed Marvel, asking him whether he really approved of E.J.’s receiving a higher salary than his. His reply: “Oh, hell yes. Then, next year you should tell the Dean that a gross injustice has been done and that the old professor’s salary has to be raised to compensate for his junior colleague’s raise.” The other senior staff members were equally generous, and we all benefitted. Nevertheless, there was no matching of Harvard’s offer two years later. We were not given the opportunity. E.J. has remained very loyal to the U. of I.—and has provided us with excellent staff members. I still remember that he did his own experiments in the tiny southeast corner of the first floor of Noyes and that his group filled the basement corner. He taught an ad hoc course in quantum mechanics for organic chemists from which fellow staff members were excused if they did not keep up with the reading assignments, I among them. New voices were added to the Illinois chorus: **Doug Applequist, Ken Rinehart, J.C. Martin, Stan Smith, Peter Beak, and Bob Coates**, all contributing special improvements to Noyes Lab and benefits to the Department of Chemistry and the School of Chemical Sciences.

During my early years at the University of Illinois, Biochemistry was housed on the fourth floor of Noyes Laboratory. **William C. Rose**, who had come to the U. of I. in 1922, was the senior professor of biochemistry and also acting Head of the Department during 1942-1946, while he served

on the Food and Nutrition Board of the National Research Council during 1940-1947. He worked on pepsin, creatin and creatinin, and purine metabolism to uric acid, but his major contributions were in the quantitation of the essential amino acids in rats, in dogs, and in man (with the graduate students as individual reaction vessels) and in their intermediate metabolism. His citation for the National Medal of Science, received in 1966, was as follows:

“For the discovery of the essential amino acid threonine and for the subsequent brilliant studies elucidating the qualitative and quantitative amino acid requirements of man and of animals.”

At the celebration of Rose's 90<sup>th</sup> birthday, he was given the opportunity of responding to kudos and did so with a remarkable description of what it was like to do research. Walking home after the celebration, my wife said to me, “Nels, if you had ever described your work with such enthusiasm, I might have become a chemist or biochemist!”



Herbert E. Carter, University of Illinois

It was **Herbert E. Carter** working with Will Rose who had done the research on threonine, including synthesis, and had migrated from the biochemistry of amino acids to that of the brain lipids and fatty acid metabolism. His contributions to antibiotic research were prodigious during the war. Incidentally, he was the first to point out the special properties of what are now called prochiral molecules, which he did for me when we were bowling one Wednesday night. On the staff from 1932, he became Head of the Department in 1954 and

then Director of the School of Chemical Sciences. Granting that I was a reasonably good chemist, he tried to assist me in becoming a better bowler, golfer, and squash player. There are good stories behind (1) his obtaining for us the right to show our own slides in seminars, an earlier province of members of the electricians' union, and (2) his convincing the director of the U. of I. physical plant that we should name the unit construction adviser to the architectural firm that was designing what

would become the Roger Adams Laboratory. I have already mentioned (3) his jump support of E. J. Corey. These were bold acts that we have savored in remembrance when we have visited each other on the eastern shore of Lake Michigan.

It was the voice of **Carl Vestling**, a third member of the Biochemistry team, that told me in 1952 that my favorite house in Urbana (adjacent to his) was for sale and that I might be able to buy it. His was my neighborly voice.

**Therald Moeller** in Inorganic Chemistry was an earlier neighborly voice, for he had alerted me to the expected vacancy of a first floor apartment in 1947 within easy walking distance of Noyes Laboratory. It is again apparent to me as I speak of the voices that I still hear that the faculty members took care of each other in many ways. Therald was also a guide in helping me set up some basicity determinations that had to be very accurate. **John C. Bailar's** contributions to the Department (Head of the summer session, for example), to teaching, and to the guidance of research students are legendary. He is regarded as the "father" of coordination chemistry, and his analysis, with E. J. Corey, of the conformations of organometallic compounds is a classic. He was also the producer of a record number of presidents of the American Chemical Society. His advice in general was fatherly.

**Theodore L. Brown** contributed a textbook in general chemistry that has had many, many printings. He and I collaborated in research establishing, by dipole moment measurements, the conformations of medium-sized ring compounds with electron donor and acceptor groups on opposite sides of the ring. He had wise words of advice and revisionary suggestions about courses and administration that may not have been taken seriously enough at first, when he lacked tenure. In time, however, his valuable guidance was recognized, and he went on to become Dean of the Graduate School and then Director of the Beckman Institute. I remember happily his cinematic greeting to me when I was celebrating my 75<sup>th</sup> birthday.

**George L. Clark** and I talked mainly about music. He was a cellist. As Head of Analytical Chemistry, his research interests were mainly in electron microscopy and powder x-ray determinations. **G. Frederick Smith** in quantitative analysis, of perchlorate chemistry fame and a helpful adviser on the subject, was a very early (1928) example of a professor who also directed a company. It is said that part of the high combustibility of Noyes Laboratory was due to perchlorates absorbed in the flooring. **Herbert Laitinen** brought analytical research into strong reputation by his work

on polarography, electrochemistry of fused salts, and electrodeposition of metals. He worked diligently on the design of the new laboratory, as did J.C. Martin, Ed Cavanaugh, and I. In performing as part of a purposeful group for nine years, those voices blended into a trusted quartet, to good result. **Howard Malmstadt** introduced the study of electronics, both theoretical and practical to training in analytical chemistry.

The Unit Operations Laboratory in Chemical Engineering was first located in the southeast corner of Noyes Laboratory, in part occupying two floors. It was the pride of **Donald B. Keyes**, Head of the Division from 1926 to 1945. Don Keyes became Chief Chemist of the Industries Branch of the Office of Production, Research, and Development (OPRD) during the war. In 1945 we traveled together to London, Oxford, Frankfurt and Paris with a Field Intelligence Unit attached to the U.S. Army, and I benefitted from his stories, his garrulous nature, and his top travel-priority rating. **H. Fraser Johnstone** came to Illinois in 1928 and worked on corrosion, the absorption of gases, aerosols, and the treatment of waste gas. He was Chairman of the Research Advisory Council of the Chemical Corps, U.S. Army, and during the war his contributions were locally visible in the form of multicolored flares (for aircraft guidance) that were being exploded in a southern extension of the campus. Head of the Chemical Engineering Division from 1953, Fraser Johnstone kept us informed as to the difficulties and progress of the committee trying to control smog in Southern California. He was an important and effective member of that committee.

**Sherlock Swann** carved out, within Chemical Engineering, a special area of organic electrochemistry, in which he became a world authority. We did some work together on the electroreduction of  $\alpha$ -aminoketones, wherein he derived pleasure from comparison of the effect of different cathodes, and my students and I, from the new method available for synthesizing medium-sized rings thereby containing nitrogen. I had as many conversation with Sherlock about Virgil Thompson's articles of music criticism as I did about electrochemistry.

**Harry G. Drickamer** came to the University of Illinois in 1946 as an Assistant Professor of Chemical Engineering. Harry's unpretentious brilliance, his straightforwardness, and his ready wit made him an attractive, amusing, and interesting colleague. Through our 56 years of friendship, I relied upon him for advice, criticism, and support, and for his cooperation in many institutional enterprises. In the period 1948-52, when Harry was first starting his work to 12 kilobars of pressure, he was, except for Bridgman, virtually the only person doing static high pressure studies of

physical (or chemical) properties above 5 kilobars. High pressure was then regarded only as a means of measuring thermodynamic and other bulk properties of matter and was not of general interest. He provided the first example of pressure tuning spectroscopy, opening up an entire field based upon the use of high pressure to alter interatomic and intermolecular distances and to uncover thereby all manner of electronic, atomic, and molecular phenomena. When Harry initiated his research involving the development of new apparatus and new techniques for high pressure spectroscopy, he was visited by Frederick Seitz, then Dean of the Graduate School of the University of Illinois. Asked by Professor Seitz to describe his intended research, Harry was so convincing in his knowledge and purpose that Seitz responded with a generous starter grant from the Graduate Research Board. So it was that Harry never lacked for research funding during all his Illinois years; moreover, his presence on institutional grant requests guaranteed that some of his scientific colleagues would fare well. He was the best research collaborator in the School of Chemical Sciences with colleagues in Physics, Engineering, and Inorganic, Organic, and Physical Chemistry.

The influence of Drickamer's pioneering research has been extremely broad, ranging from physical chemistry, biophysics, and molecular biology to solid state physics and electronics. The use of pressure tuning spectroscopy to investigate biomolecules, has spread to at least 50 laboratories worldwide. In addition to sessions at general high pressure conferences, there have been specialized conferences on high pressure in biochemistry and molecular biology and there are now annual meetings of the European High Pressure Research Group, the Japanese High Pressure Group, and the Gordon Conferences on High Pressure Research. There have also been a series of NATO Advanced Institutes on High Pressure in Chemistry, Biochemistry, and Materials Science. There exist two international journals devoted to high pressure as well as national journals in China and Japan. An international school (III) was held in Warsaw, Poland, in September, 1999. All of this started with Harry Drickamer's initial research in Noyes Laboratory, 1946. He never let me forget what he was doing in the laboratory. Every time I sent him a copy of my travel itinerary so that he could keep track of me, he responded with a batch of his latest preprints, to be followed in good time with the corresponding reprints. Did I read them all? I had to! There would be brief reviews each time we met or talked on the telephone. Harry was a frank evaluator of the potential of others, whether in research, administration, writing, getting a job done on time, and in sensing whether

a scientist or historian or athletic fan really knew what he was talking about. I took a lot of teasing and insulting from Harry, but regarded it as aggressive affection, and I appreciated the fact that he regarded me worth teasing in this way.

I am followed by Harry's voice in a graphic statement that pertains to the British sense of humor and proceeds as follows:

“If you want to make an Englishman happy in his old age, tell him a good joke on his youth.”

These words would be followed by Harry's version pertaining to his colleagues' sense of humor:

“If you want to amuse a colleague, tell him a joke.  
If you want to give him more amusement, tell him the same joke again.  
Why? He may get it the second time.”

When he wanted to terminate a conversation, he sometimes said in parting:

“Sorry, I have to go now to flog a student.”

The citation for Harry's National Medal of Science in 1989 says it all rather simply:

“For the discovery of the ‘pressure tuning’ of electronic energy levels as a way to obtain new and unique information on the electronic structure of solids.”

Harry was also a professor of Physical Chemistry. During my time in Noyes Laboratory, **Frederick T. Wall**, **Herbert S. Gutowsky**, and **Peter Yankwich** added luster to that discipline, to be followed by others who brought the disciplines within chemistry more in balance than they had been initially. Nobel prizes have been garnered by a former Ph.D. student, **Phillip Sharp**, and by a former staff member, **Rudolph A. Marcus**. The citation for Rudy's National Medal of Science awarded in 1989 read:

“For his fundamental, far-reaching, and eminently useful developments of theories of unimolecular reactions and of electron transfers in chemistry and biochemistry.”

If a prize were to be given for sense of humor, Rudy could win that as well.

**Fred Wall** supplied theory for all polymerizations and led the physical chemistry portion of the Rubber Program during the War. According to the students, his teaching of thermodynamics was absolutely super. His personal quality of exactitude, in early years, encouraged some practical jokes. **Peter Yankwich**, who later made an impact through the National Science Foundation on the teaching of science and of chemistry in the United States, helped us socially for a time by guiding a burgeoning Faculty Club. **Herb Gutowsky** performed a great service, together with his students and followers, of transferring NMR from the purview of theoretical physicists to the practice of chemists, laying the foundation for the origin of chemical shifts and their use in chemistry; the existence and origin of spin-spin couplings between nuclei in molecules in liquids; the use of NMR to study structure and motion in solids; the use of NMR to study chemical exchange processes and conformation changes. The citation for his National Medal of Science (1976) read simply:

“In recognition of pioneering studies in the field of nuclear magnetic resonance spectroscopy.”

Especially under the leadership of Herb Carter and Herb Gutowsky, the University of Illinois could claim a primary place in the instrumentation available for research, along with all service facilities.

I have been trying to indicate the diversity of the Chemistry, Biochemistry and Chemical Engineering that was housed in Noyes Laboratory, as suggested by the different professors and, somewhat imperfectly and incompletely, by the voices I still hear. A further, special example of diversity, was in what happened in 1950 on the third floor of Noyes. A quantum leap in quality of the Microbiology Department took place with the hiring of **I.C. Gunsalus**, **Salvador E. Luria** and **Sol Spiegelman**. These colleagues, with their students, operated in cramped space until new quarters became available together with other components of the School of Life Sciences. The breadth of accomplishment of these Noyes-belonging faculty members did not go unnoticed. Gunny later moved into position as Head of Biochemistry and continued to add distinguished faculty to that discipline. His lesson to me involved how to do something ambitious and possibly important. Salvador Luria showed a unique ability, in the University Senate, of steering parliamentary procedure in a useful fashion. In Medicine, he received the Nobel Prize after he had moved to M.I.T. He had also been the mentor of another

Nobel Prize winner, James Watson. Luria's citation for the National Medical of Science, awarded to him in 1991, read:

“For a lifetime devoted to applying genetics to viruses and bacteria and for guiding the development of generations of students who have helped create the modern power of molecular biology.”

Sol Spiegelman always gave the impression that he was doing a crucial experiment and, indeed, he probably was. He went from Illinois to the Medical School of Columbia University where, as an M.D., it was possible for him to continue cancer research with human subjects.

Diversity was also to be found in the students who spent part of their existence in Noyes Laboratory. The undergraduates, industrious and eager in general, came from Illinois cities, towns, and rural communities. The graduate students came from the great universities and distinguished colleges of the country. Any measure of greatness that accords to the University of Illinois in the Chemical Sciences started with staff and student inhabitants of Noyes Laboratory. During the academic year 1907-1908, the first year on campus of William A. Noyes, so said the Alumni Quarterly, 180 students from 52 different colleges and universities other than the University of Illinois were enrolled here in graduate work. President Charles W. Eliot, visiting that autumn from Harvard, “was deeply impressed” with the budget of \$50,000 per year. To a convocation of the students of the University of Illinois, he made the statement:

“Do your work as if you hoped to realize perfection. That is what brings joy and contentment in life.”

Those are words that we should continue to “hear”!

## **MY COWORKERS AT ILLINOIS AND SENIOR COLLABORATORS**

Any story of my life that does not contain a record of all the junior colleagues who worked with me at the University of Illinois would be incomplete. Research is a cooperative venture, and that is what has made it exciting and purposeful. The scientific development of each student is a complicated, dynamic process, during which there also occurs (hopefully) development of the professor. Cooperation among the

colleagues transforms the research group into a more effective unit than the sum of their separate efforts would realize. Finally, affection, mutual appreciation, and some humor bind the research family together. Several of my research colleagues at Illinois have been mentioned in the earlier descriptions of problems and progress that marked each period of our work in chemistry, biochemistry and plant physiology. I now list all of my colleagues whose work advanced not only their careers but mine: B.S. and M.S. students, Ph.D. students, and postdoctorates. They were terrific.

### B.S./M.S. Students

William R. Armstrong	Loren W. Bannister
James Basso	Louis L. Ferstandig
Francis E. Fischer	Michael P. Groziak
Donald L. Helfer II	Hershal L. Herzog
Jeffrey A. Hilb	Sharon Ho
Lillian Ruth Hruda	Richard J. Johle
Linda Kostuba, M.S.	Felice Mary Kraft
Jack Kwiatek	Frank W. Long
Henry Lotsof	Bruce Morrison, M.S.
Marian Perkins	Seymour Preis
Richard T. Rapala	Melvin A. Rebenstorf
Gail Rivers	Deborah Roberts
Edgar R. Rogier	William Smart, M.S.
Carl M. Smith	Leonard C. Smith
Gilbert Stein	Harris R. Till, Jr.
Eleanor Jayne Wilfred	Wayne L. Wittenberg
Vivian Wolfman	

### Ph.D. Students

1948	Karl M. Beck	
1949	Eric Barthel, Jr.	Roger E. Beyler
	Joseph H. Boyer	Emmett H. Burk, Jr.
	Donald L. Felley	Archibald M. Hyson
	Gerhard W. Leubner	Erwin W. Nommensen
	William V. Ruyle	Gradus L. Shoemaker
1951	Sidney Baldwin	Seemon H. Pines

1952	James W. Curry Robert L. Foster Aaron B. Herrick Ernest D. Nicolaides Bernard L. Ryder	John Figueras Jr. Virgil W. Gash Edward H. Mottus Gene C. Robinson Allen B. Simon
1953	James W. Berry Glenn Fuller Alexander J. Kresge John J. Sagura	Richard C. Fox Samuel Gelfand William J. Middlecotn
1954	David M. Locke	Paul D. Thomas
1955	Debabrata Choudhury Allan S. Hay	Richard W. Fulmer Lee A. Miller
1956	Fred P. Hauck, Jr.	Ronald R. Sauers
1957	Kenneth Conrow Duane F. Morrow	John C. Little Clarence W. Schimelpfenig
1958	Joe A. Adamcik	Frederick H. Owens
1959	A. Gilbert Cook W. Kenneth Musker	Terry W. Milligan
1960	Stanley W. Blum	Wilmon B. Chipman
1961	James A. Deyrup LeRoy W. Haynes	Yu-Lan Chang 'Tong
1962	Carl R. Johnson Wallace L. Rippie	Marvin J. Konz
1963	Walter J. McMurray John C. Summers	C. K. Steinhardt Andrew E. Yethon
1964	Kenneth R. Fountain Joseph V. Paukstelis	Richard A. Laursen G. Edwin Wilson, Jr.
1965	Jeremy R. Fox Walter J. Musliner	Philip C. Kelley

MORE THAN A MEMOIR

1966	Kermit L. Carraway Robert Y.F. Ning	Ping-Cheong Huang
1967	David A. Durand Kenneth C. Zahn	Ronald Lambert
1968	Douglas T. Browne	Jeremy A. Kleiner
1969	Daniel Dixon T. Gordon Scott	Robert H. Feiertag Roy A. Swaringen
1970	Sidney M. Hecht Sheldon A. Schaffer	Thomas R. Keenan
1971	Jerome T. McDonald	John A. Secrist III
1973	Robert L. Cundall Charles R. Frihart Anthony J. Playtis	Larry G. Dammann Richard E. L. Henderson
1974	John C. Greenfield Glen L. Tolman	Alan G. Morrice Graham C. Walker
1975	Douglas L. Cole	
1976	David F. Wiemer Charlotte F. Otto	Bruce A. Gruber
1977	Brian N. Holmes Richard W. Thomas	Jane Berlin Theiler
1979	Jorge R. Barrio Gene E. Keyser	Jerry D. Bryant Pieter J. VanDerLijn
1980	Robert H. Foster	Monique H. Hinterberger
1981	Anthony W. Czarnik, Jr. Joseph B. Holtwick	David Haines Kenneth P. Moder
1982	Mary S. Rosendahl	
1983	Alan M. Jones	Ralph A. Lessor

	Mitchell A. Rossman Wayne Wittenberg	Thomas M. Stevenson
1984	Venkatesalu Bakthavachalam	Marc d'Alarcao
1985	Dee Ann Casteel	
1987	Gary L. Clauson	
<b>Post-Ph.D. Colleagues (Country of Origin if not U.S.A.)</b>		
1950-1951	Hugh L. Dryden, Jr.	
1953-1954	Takeshi Hashizume	Japan
1953-1955	Michinori Ōki	Japan
1954-1955	Stefano Chiavarelli	Italy
1959-1960	Michael J. Martell, Jr.	
1959-1961	Klaus Jann	Germany
1960-1961	Edgar F. Kiefer James E. Mulvaney	
1960-1962	Takeo Sato	Japan
1961-1962	Hans M. Götz Bertold Müller	Germany Germany
1961-1963	Tozo Fujii	Japan
1961-1964	Leonard Brady	
1962	Minoru Sekiya	Japan
1962-1963	Sheldon E. Cremer M. M. Gale Richard A. Langdale-Smith Jacob Lehrfeld	Burma United Kingdom

MORE THAN A MEMOIR

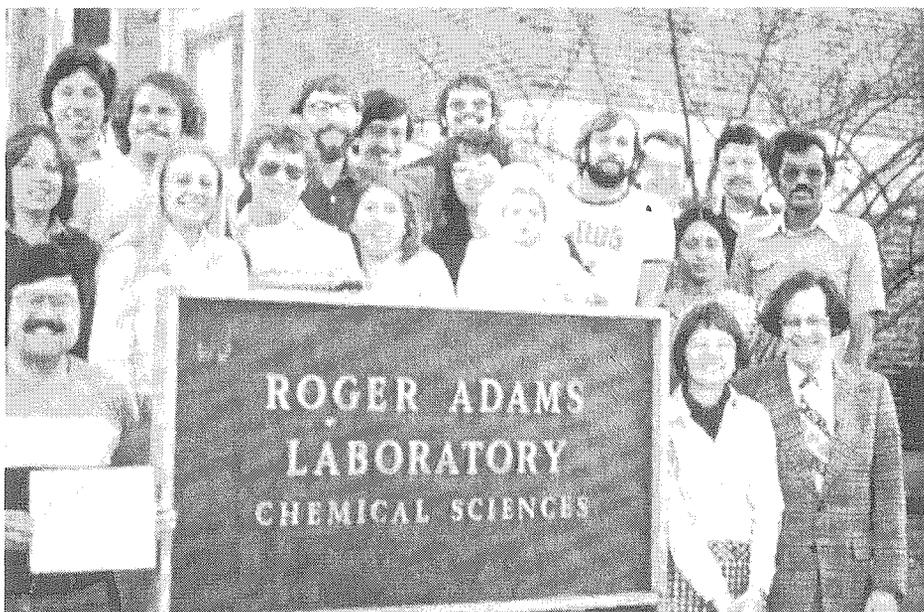
1963-1964	Stephen W. Breuer W.D.L. Crow Richard N. Loepky Andrew L. Ternay	United Kingdom Australia
1964-1965	Beat Bochner Indukanth S. Ragade Fumihiko Uchimaru Uwe Zarnack Binne Zwanenburg	Switzerland India Japan Germany The Netherlands
1966-1968	A. S. Gupta	India
1967-1968	J.T.A. Boyle DeLanson R. Crist K. Golankiewicz Vasu Nair	United Kingdom Poland Fiji Islands
1968-1969	Hajime Iwamura Robert S. McCredie Donald F. McLaen	Japan Australia
1969-1970	John C. Coll John H. Craig	Australia
1969-1971	Keiichi Ito Marshall W. Logue	Japan
1970-1972	Donald E. Bergstrom Adam Vincze	Israel
1970-1973	Jorge R. Barrio	Argentina
1971-1972	Dov Ben-Ishai Ichizo Inoue John A. Scrist III	Israel Japan
1971-1973	Kiyoshi Mutai	Japan
1971-1974	Leslie H. Kirkegaard	
1972-1973	Maria del Carmen G. Barrio	Argentina

NELSON J. LEONARD

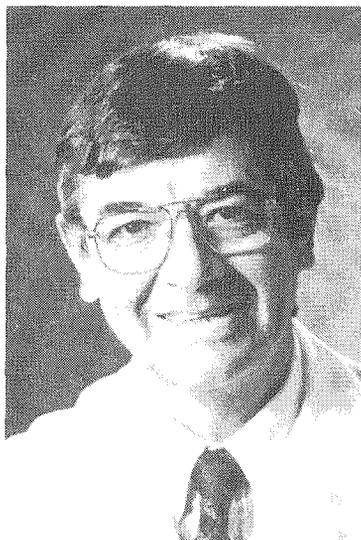
	Laurence G. Dammann Richard E. L. Henderson Mineo Saneyoshi	Japan
1972-1974	Thomas R. Henderson	
1973-1975	Robert C. Moschel Bruce Resnick Prem D. Sattsangi Mark A. Sprecker	India
1975-1976	David I.C. Scopes	United Kingdom
1975-1978	Jorge R. Barrio [Visiting Scientist, 1975-1977; Research Chemist, 1977-1979]	Argentina
1976-1984	L. Lee Melhado	
1977-1978	Gauke Veenstra	The Netherlands
1978	Bozenna Golankiewicz	Poland
1978-1979	F. Hardy Moore III	
1978-1983	Ram S. Hosmane	India
1981-1982	Roman Balicki	Poland
1983-1984	Kunihiro Sumoto	Japan
1981-1985	Fred T. Oakes	
1982-1984	Katherine J. Gibson	
1982-1985	Kenneth A. Cruickshank	United Kingdom
1983	Ulrich Jordis	Austria
1983-1984	Y.S. Agasimundin	India
1984-1985	S. P. Hiremath	India

MORE THAN A MEMOIR

1984-1986	Franciszek Kazmierczak	Poland
1984-1987	Belakudru Devadas	India
1985-1988	Shiv Kumar	India
	Vemanna D. Patil	India
	David E. Pereira	Slovenia
	Andrej Petrič	Poland
	Andrzej Rykowski	
1985-1989	Michael P. Groziak	
1985-1994	Balkrishen Bhat	India
	Neelima Bhat	India



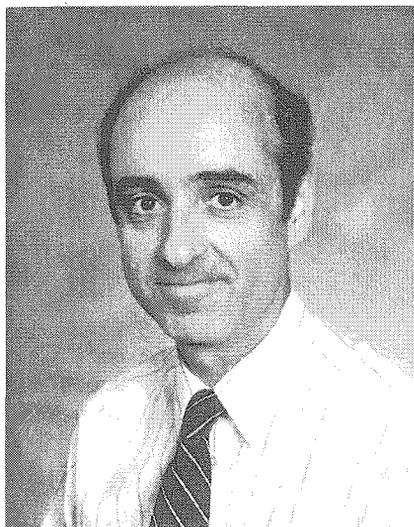
Research group and a few extras, 1981



Jorge R. Barrio



Balkrishen Bhat



Sidney M. Hecht



Carl M. Johnson



Graham C. Walker



Andrew H.-J. Wang

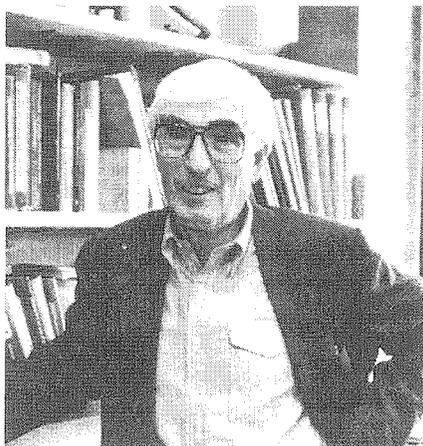
## SENIOR COLLABORATORS

For details, see:

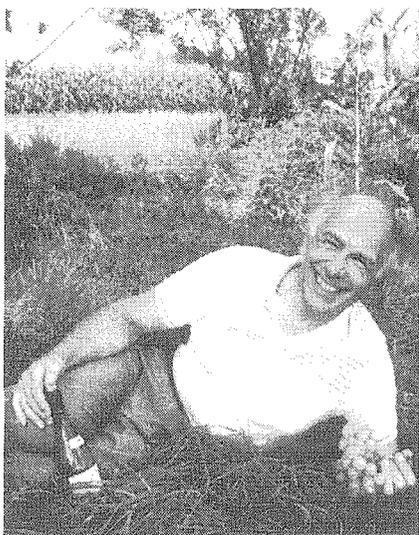
'The 'Chemistry' of Research Collaboration, N.J. Leonard, *Tetrahedron*, **53**, 2325-2355 (1997)



Carl Djerassi, Stanford University



Jack D. Dunitz, E.T.H. Zurich, Switzerland

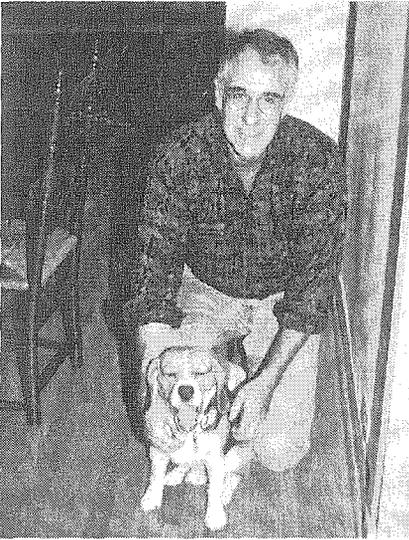


Terry Eisinger, Bell Research Laboratories



Tozo Fujii, Kanazawa University, Japan





Pierre R. Le Breton, University of Illinois,  
Chicago



Léo Marion, Canadian National Research  
Council



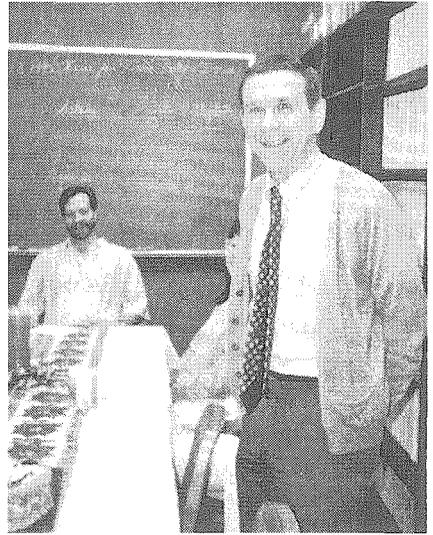
Michinori Ōki, Tokyo University



Charles C. Price, III, University of Illinois



John D. Roberts, California Institute of Technology



Robert Roskowski, Jr., Louisiana State University Medical Center



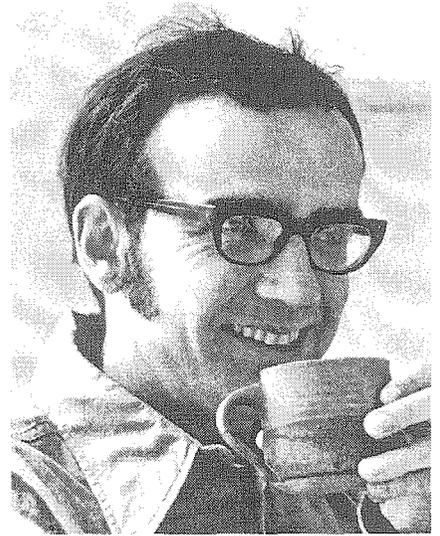
Folke Skoog, University of Wisconsin



Sherlock S. Swann, Jr., University of Illinois

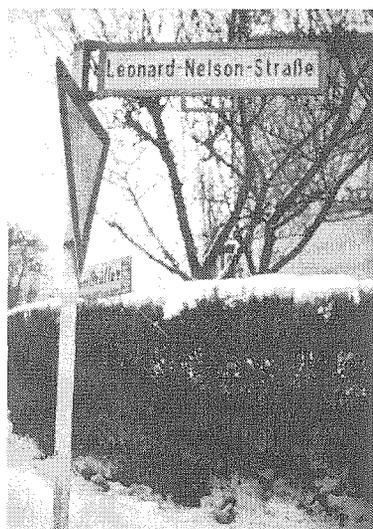


Robert L. Switzer, University of Illinois

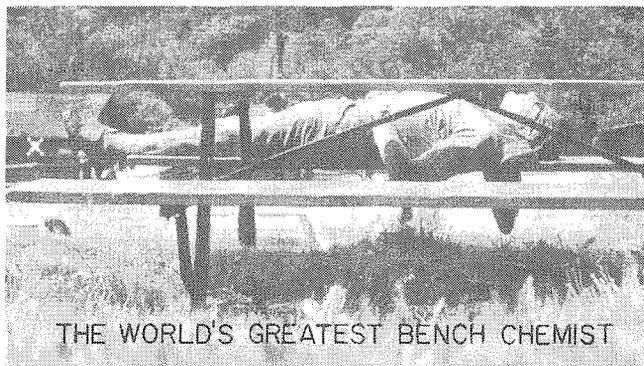


Richard Wolfenden, Princeton University

With all due respect . . .



NJI's desk. Where did he write?



THE WORLD'S GREATEST BENCH CHEMIST

Student/Colleague contributions