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Autobiography: A Clinician's Odyssey

Generoso G. Gascon, MD

You can't go home again

– Thomas Wolfe (1940)

It was a Sunday morning, and I was looking at the Sunday newspaper comics page with the console radio in the background. Suddenly, I heard explosive sounds like thunder or fireworks. I ran out into the yard after my alarmed parents, looked up, and saw a Japanese Zero flying low enough that I could see the pilot's face. I did not know then, of course, what was happening, but years later, I learned that the planes had approached Oahu from the north, the part of the island where we lived at that time, bombed the Kaneohe Naval Air Station first, then flew low to avoid radar, and then up over the Koolau range in a surprise attack on Pearl Harbor on the south. The date: December 7, 1941.

I was 5 years old. We lived in a sugar plantation town; my father worked in the fields. The first doctor I remember was Dr Charles Black, who cared for my pneumonia at the Kahuku hospital. It was a country childhood, flying kites my father made, bathing in the hot Japanese public baths, waving to the sugarcane trains passing by, and watching Hopalong Cassidy, Roy Rogers, Gene Autry, as well as the original Bambi movies. I was only aware there was a war from the newsreels that usually preceded the main feature film, the blackouts, paper and tin can drives, and the bomb shelter we had to dig in our yard, and that my mother worked for the United Service Organizations (USO).

My parents had emigrated to the Territory of Hawaii from Dingras, Ilocos Norte in the Philippines during the great depression to seek a better life. They were part

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of the successive waves of workers that the sugar and pineapple plantations (founded by descendants of New England missionaries) recruited from Asia to work in the fields, starting in the late 19th century, even before the Kingdom, and then the Republic, of Hawaii was annexed as a Territory by the United States. This was the multiethnic, multicultural, multireligious, multicolored, warm, and sunny environment into which I was born and within which I grew up.

We moved to Honolulu shortly thereafter. I remember climbing coconut trees in the Iolani Palace grounds for fresh coconut juice, roller skating on the sidewalks of the Federal tax building, playing hide and seek in the Kawaiahaio Church (the Westminster Abbey of Hawaii) cemetery grounds, and picnicking and swimming at Ala Moana, the large city beach park on the edge of the Waikiki area. I shined shoes for sailors in port when they spent leave time on Hotel Street. On the day Franklin Delano Roosevelt died, I sold newspapers shouting "Extra! Extra," then added the headlines.

Up to the fifth grade, I attended Cathedral School, where the Brothers of Mary tried to convince me to enter the priesthood, and where the whole school learned how to sing the Latin High Mass. My parents divorced during this time, and my father returned to the Philippines. My mother later remarried, and we moved to another sugar plantation town, Aiea, today a western suburb of the city of Honolulu.

We first lived in post–World War II United States Navy barracks housing, because my stepfather, who had been in the Army Air Force and graduated from San Jose State College in California, found a civil service position working for the US Navy at Pearl Harbor that paid better than a public school teacher's salary. When sugarcane land in the hills above Aiea opened up for residential development, my family bought a lot, built a house, just below CINC-PAC (Commander in Chief of the Pacific, Headquarters). The US Navy housing in the valley below where we had lived was leveled, and today, it is the site of Aloha Stadium, where the annual National Football League Pro Bowl is played every February.

Up through the ninth grade, I was steeped in "local" culture—walking barefoot or with zoris (the original

flip-flops), talking “pidgin,” hiking in the mountains for mountain apples and guavas, and a summer job picking pineapples. About to enter high school, my life was changed irretrievably by a favorite teacher, Y. Mikami, and the principal, Charles Griswold, of the Aiea Elementary and Intermediate School. They convinced my parents, particularly my stepfather, to push me to apply for entrance examinations and interviews to Punahou School, an elite college preparatory school in Honolulu, which I did so reluctantly, but acquiesced when I was awarded a scholarship. This was to be a major turning point in my life, with exposure to upper-middle-class socioeconomic culture and values and the beginning of a tension between assimilation and alienation, which was to subconsciously haunt me for years.

Punahou opened a door to a whole new way of life—a tough precollege curriculum, before the days of Advanced Placement and Baccalaureate programs; stimulating teachers, who sometimes also doubled as team coaches; regular school dances, weekly canteens, required chapel and Reserve Officer Training Corps (ROTC), pep rallies Fridays before weekend football games; and various other traditions. Through the history of the school, the largest independent school west of the Mississippi, I learned how Punahou intertwined with the history of the 19th century Kingdom of Hawaii, the Republic of Hawaii, and annexation as a territory by the United States in 1900. Some of its late 20th century alumni who have had national impact are John Gardner, who founded Common Cause, Steve Case, founder and ex-CEO of America Online, and Barack Obama, the first Hawaii-born and raised President of the United States.

My first vocational interest was chemistry, thanks to an after-school job cleaning flasks in the chemistry lab for Clarence Peters, chemistry teacher. Edith Townes, physics teacher but also the yearbook advisor, opened up the world of natural light photography for me as I worked with her as co-editor of the yearbook. Siegfried Ramler, who is still there, made German fun and interesting, so much so that years later, after my junior year in college, I spent a summer in Germany living with a family in Bonn as part of the Experiment in International Living, the forerunner of the Peace Corps. Robert Rich opened up awareness of current events and national politics in history class by having us read and discuss *Time* magazine weekly, which, in retrospect, was very much civics training. In the background all through high school, my mother was urging me to become a doctor.

Serendipity is the faculty of finding things we did not know we were looking for.

— **Glauco Ortolano (2008)**

After all the meticulous researching, planning, Scholastic Aptitude Tests (SAT's), applications, and acceptances, my arrival at Columbia University was unplanned. I had my sights on some “East Coast college,” and although I was accepted at a number of them, from Honolulu, with little

chance to do college visits, they all looked the same to me. I had no idea then what a difference a liberal arts education would make. My decision was made easy by the fact that Henry Coleman, the next Dean of Admissions at Columbia University, who was at that time with the US Navy in Hawaii, interviewed me. A subsequent scholarship clinched the decision to jump from the island I had never left to the largest city in the country.

If you can make it there, you can make it anywhere . . .
— **“New York, New York”**

. . . We're all young together, and the best of life's ahead . . .

— **“Marching for Columbia”**

My Columbia University years in New York were the most mind expanding and intellectually stimulating in my life, from the late night bull sessions in the dorms during Freshman Orientation, through the core curriculum of Contemporary Civilization and Literature and Arts Humanities required in the first 2 years, through completion of the courses in my concentration—philosophy. Columbia University and New York were where my ongoing discovery of the larger world and my interest in international relations really began.

I had resisted my mother's urgings to go into medicine and had become interested enough in psychology, probably because of my search for identity, that I thought I might make it my major. A freshman year psychology course, which turned out to be mainly feeding rats pellets according to various ratios and recording response curves, turned me off, because I was interested in human psychology, and, at that time, did not see the relevance of operant conditioning. The core curriculum courses, my interest in Existentialism, and the meeting of like-minded friends led to my concentration in philosophy. In deference to my mother, I did take the minimum science courses premeds needed to take for acceptance to medical school. However, my attitude was that the college years were there to explore and develop one's self as a whole; there would be the rest of one's life for science in medical school and thereafter.

The unexamined life is not worth living.

— **Apology 38a, Socrates**

My most influential teachers—Sydney Morgenbesser in a Contemporary Civilization course, Charles Frankel and John Herman Randall Jr in philosophy, and Eric Bentley, who had translated Bertolt Brecht's plays and was a prominent theatre critic. With the addition of Off Broadway to the New York theatre scene, I launched into seeing 20 or more plays a year and developed a persisting love of the theatre. Most memorable were the Circle-in-the-Square production of Eugene O'Neill's *The Iceman Cometh* and the revival of

The Threepenny Opera, by Brecht and Kurt Weill, at the Theatre de Lys, starring Lotte Lenya, Weill's widow.

On campus, I enjoyed singing with the Glee Club at college campuses, Town Hall and Carnegie Hall. Presiding over the International Students Club (ISC) further opened up the world for me, not only by meeting students from all over the world, but becoming aware of the multicultural opportunities for mutual understanding in the city itself, with institutions like International House and the United Nations. Peter Rosenberger was a graduate student in philosophy at Columbia University at that time, whom I first met at the ISC. Little did we know that we would both become pediatric neurologists and wind up in late life in the same department.

In the meantime, my interests had evolved, somewhat logically in retrospect, from psychology, to philosophy, to psychiatry. I rationalized applying to medical school by reasoning that one needed an MD degree to become a psychiatrist. It was with that goal in mind that I entered Boston University School of Medicine (BUSM).

The Athens of America

As an adopted New Yorker, I found the move to Boston an emotional downer, at first. Boston University School of Medicine was located in the south end, and I lived in Worcester Square, across from Boston City Hospital, in an impoverished, inner-city neighborhood. The first 2 years seemed to me, with the tons of basic information needed to memorize and regurgitate, and after the exciting interchanges that required critical thinking in college, a retreat to elementary school thinking.

Nevertheless, I pursued my interest in psychiatry by doing summer research with Peter Knapp, my earliest faculty influence in medical school. He was a psychiatrist-psychoanalyst whose research was in psychosomatic medicine, particularly on possible emotional causes or triggers of bronchial asthma. I spent my first summer designing and building a closed respiratory system, into which pleasant and unpleasant odors could be inserted, while recording breathing patterns. The project was eventually taken over by a graduate student, who used it as the basis for his PhD thesis.

In my second medical school summer, I took an externship at the New Hampshire State Hospital in Concord, along with 5 other medical students. All of us had finished our Physical Diagnosis courses, and our duties performing admission histories and physicals on acute psychiatry patients afforded us a chance to polish our examination skills. I was able to do some "psychotherapy" under the supervision of staff psychiatrists. This was where I first learned how to talk to, or, more accurately, listen to, schizophrenics, as well as appreciate first-hand the crudeness of therapies in psychiatry for major psychoses—

electroconvulsive therapy and insulin-induced hypoglycemia. The use of phenothiazines was in its infancy.

Nevertheless, this was a seminal summer because of my first exposure to clinical neurology. Every other week, we externs had to present a case to a visiting neurologist from Boston, who would then quiz us and discuss the patient. Most impressive was a young, junior faculty member from BUSM and the Boston Veterans Administration (VA) Hospital, Norman Geschwind. I subsequently took an elective in my fourth year at the Boston VA Hospital, where the Aphasia Research Center was at its heyday, with the likes of Fred Quadfasel, Harold Goodglass, Frank Benson, and Edith Kaplan. The "neoclassical" approach to aphasia, based on clinicopathological correlation and a reinterpretation of localizationist approaches of the late 19th century continental neurologists with the concept of disconnection syndromes, appealed to me because I could integrate that with my previous interests in psychology, philosophy, and psychiatry and clinical neurological examination skills.

In the meantime, BUSM had a unique community medicine requirement in the third year, a Home Health Service. We were the "primary care physician" for the south end and Roxbury, the poorest inner-city neighborhoods, where we did house calls. The experience gave me an appreciation of the social and economic context that affects disease presentation. The dynamic leader of the program was Pauline Stitt (see Figure 1). I struck up an easy relationship with her because she had spent a good deal of her life in public health in Hawaii, and knew the islands well. I was glad to have visited her at the Arcadia in Honolulu, to which she retired, years afterward, before she died, because she remained an advisor throughout much of my early career. When I started working abroad, she advised me not to spend more than 2 years outside of the United States because that would imperil my academic career. I later disregarded that advice with some trepidation, not knowing where my odyssey would lead me.

My parents' first trip to Boston was to see me graduate from medical school—the culmination of my mother's dream—"my son the doctor."

Meredith [narrating]: Bones break. Organs burst. Flesh tears. We can sew the flesh, repair the damage, ease the pain. But when life breaks down . . . when we break down . . . there's no science. No hard and fast rules. We just have to feel our way through . . .

— "Here Comes the Flood," *Grey's Anatomy*

My internship at Washington's D.C. General Hospital was a "blood and guts" year. I had wanted a year to immerse myself in frontline acute medicine, because I knew by then, that I was going to enter either psychiatry or neurology, both relatively sedate specialties, and I wanted to



Figure 1. Dr Pauline Stitt. Early career advisor.

experience a busy, hands-on year. That I got—gunshot wounds, rapes, knifings, as well as hypertensive crises, acute myocardial infarctions, and pneumonias. DC General was in Southeast Washington, with all 3 medical schools—Howard University, Georgetown University, and George Washington University (GW), having services there. Mine was a mixed internal medicine/surgery year in the GW service, with a month's elective in the Georgetown acute psychiatry service, where, as a naive intern, I was outsmarted by wily drug addicts, and was assaulted by 2 psychotic female patients while doing rounds. I was also surprised to learn how many delusional people come to Washington to “shoot the President.” The President during my internship year was John F. Kennedy.

My most vivid memory outside of the hospital that year was listening to a fiery Jesse Jackson at the Washington Monument concluding his warm-up speech with the black power salute, before we stepped off past the tent city to start the Poor People's March.

After DC, I returned to Boston for a first year of adult neurology residency at the Boston VA Hospital. Norman Geschwind (see Figure 2A) had just succeeded Fred Quadfasel as the Chairman of Neurology. Martha Denckla and I were his first first-year residents. The most vivid memory of that year was standing and looking at the TV

sets at the VA Hospital on November 22, 1963, in utter disbelief, shock, and sorrow. That year solidified my resolve to enter neurology.

**The stars at night, are big and bright
deep in the heart of Texas
The prairie sky is wide and high
deep in the heart of Texas.**

– “Deep in the Heart of Texas,” George Strait

During the Vietnam War, a doctor draft went into effect. Under the Berry Plan, a medical student could choose when he wanted to enter the service. Since I was not sure what I would specialize in when I signed up in medical school, I had elected to enter after my first year of residency.

The US Army assigned me to Darnall Army Hospital at Fort Hood, in the “heart of Texas” country, which at that time was the largest US Army base west of the Mississippi River. General George Patton had trained his tankers there. Elvis Presley did his basic training there, before serving in Germany. I learned on-the-job, because there was no neurosurgeon, and I had not had my electroencephalogram (EEG) rotation at the Boston VA Hospital. Subarachnoid hemorrhages and spinal cord trauma had to be evacuated by helicopter to Brooke General Hospital, Fort Sam Houston, San Antonio, Texas.

Two main things stand out in my professional development during these 2 US Army years. I saw a sergeant's wife who had psychomotor seizures triggered by listening to country and western music, shortly after I had read Francis Forster's work on musicogenic epilepsy. I phoned Dr Forster; he flew her to Madison, Wisconsin, on a research grant and worked out a deconditioning program for her. All this sparked my interest in epilepsy and my very first publication, as a co-author.¹

Paradoxically, the US Army steered my career plans away from adult to child neurology. I started seeing the children of many soldiers, who had learning problems and language delay. Empress Zedler, to whom I sent these children for psychoeducational evaluations, was on the faculty at San Marcos State College, Lyndon Johnson's alma mater. My interest was aroused because I could relate children's learning and language problems to what I had learned about adult aphasia and other higher cortical functions. I learned from her what kinds of tests and evaluations were appropriate for children and discovered that I enjoyed working with them. So, I applied for a pediatric neurology residency. I was fortunate enough to be accepted at a relatively young program, the combined Children's Hospital-Peter Bent Brigham residency, to be called later, with the addition of the Beth Israel Hospital, the Longwood Neurology Program, under the chairmanship of Charles Barlow, Bronson Crothers Professor of Neurology (see Figure 2B).

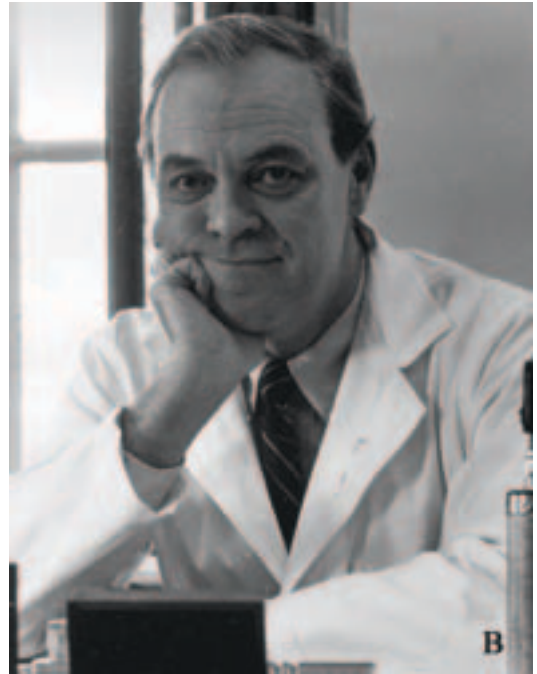
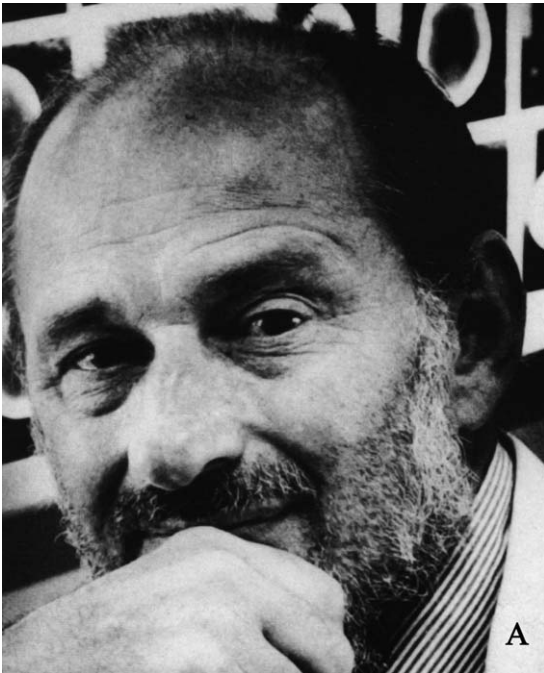


Figure 2. Professional mentors. A, Norman Geschwind. B, Charles Barlow. C, Cesare Lombroso. D, Peter Wolff.

Veritas

Barlow had brought with him from the University of Chicago, Gordon Watters and Bob Cutler. Dr Randolph Byers was a legend already at Children's. Cesare Lombroso had succeeded William G. Lennox as the chief of the

seizure unit. H. Richard Tyler was the chief at the Brigham Hospital, and David Dawson joined him shortly thereafter. Floyd Gilles was the neuropathologist. This was the stimulating faculty under whom I trained. The residency training was unique, in that residents spent equal time in adult and child neurology and had to carry

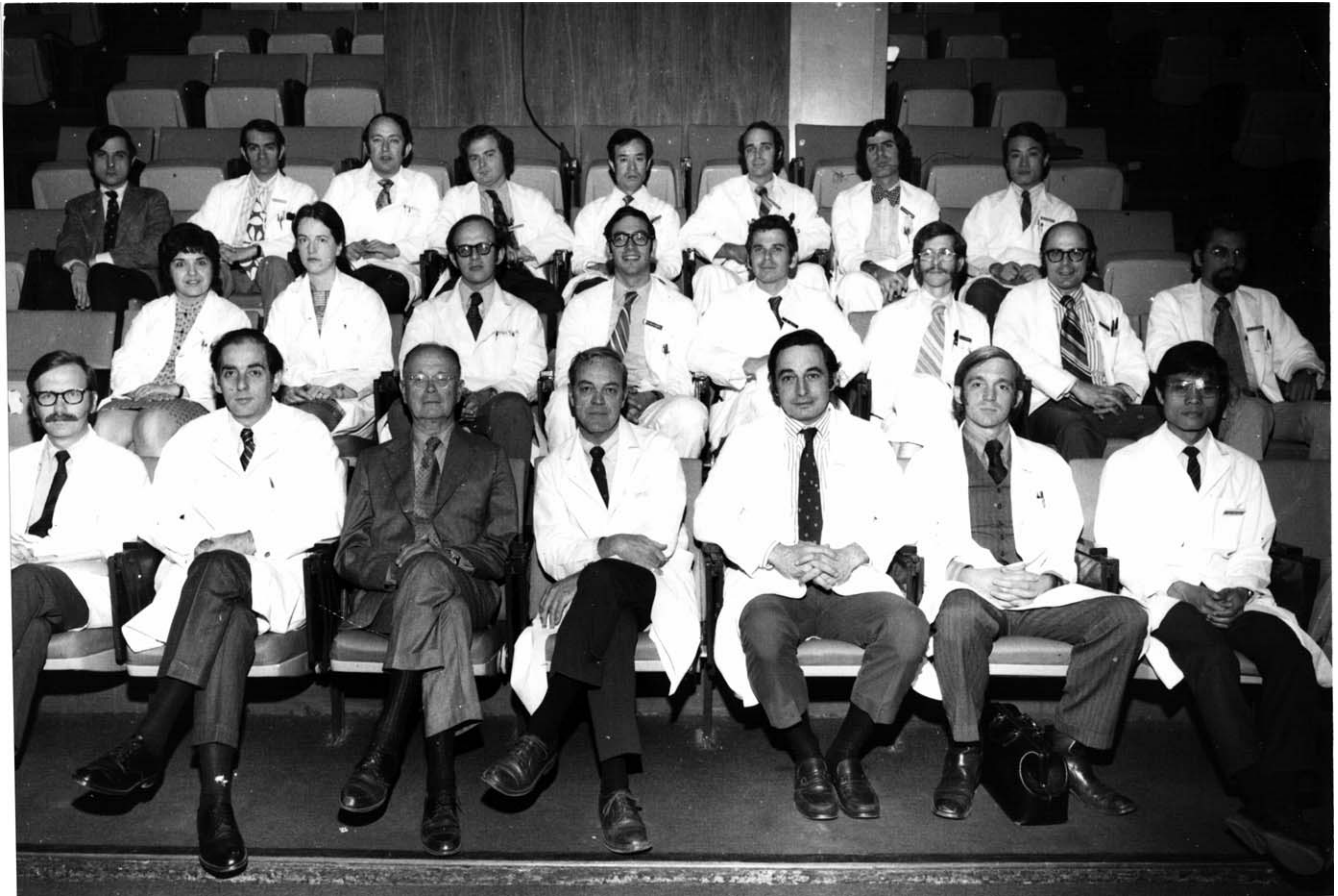


Figure 3. Longwood Neurology Program, faculty and residents, 1970. First Row: Michael Bresnan, H. Richard Tyler, Randolph Byers, Charles Barlow, David Dawson, Frank Duffy, Generoso Gascon. Second row: Lisa Yessasyan, Tessa Hedley-White, Hugh Firemark, Howard Weiner, Larry Levitt, Michael Goldstein, Richard Moxley, Larry Kneisley. Third row: William Schoene, Paul Chervin, Israel Abrams, Michael Moskowitz, Toru Korukawa, Lanny Edelson, Mark Kozinn, Genjiro Hirose.

an adult and a child neurology clinic through all 3 years. When the program was started, the Board requirements for certification in child neurology had not yet been established (see Figure 3).

Frank Duffy, who is still at Boston Children's Hospital, was in my training year and was shortly to begin creating BEAM (brain electrical activity mapping). Kuna (Israel) Abrams, who was later to become the first Chief of Pediatric Neurology at the University of Massachusetts, was a year below me. We later covered each other's practices. My chief resident was William (Bill) Olson, who years later, recruited me to the University of North Dakota, where he was to become the first professor and chairman of neurology. He was then, and later, always an entrepreneurial, colorful character, from whom I learned how to run a service. One of our visitors whom Bill and I squired around was a medical student from Pittsburgh interested in biochemistry and metabolic diseases, who was considering pediatric neurology as a specialty, Mike Painter.

I had always thought I would return to Hawaii to practice after training. To my disappointment, pediatricians I

visited in Honolulu painted a poor picture of success for such a new specialty and were not encouraging. So, when I was offered a position with Dr Lombroso in the seizure unit, I accepted.

The seizure unit was an exciting place to start a career. Besides Dr Lombroso (see Figure 2C), my colleagues were Giuseppe Erba, Frank Duffy, and Kuna Abrams. The neurosurgeons we worked with were Donald Matson and John Shillito, 2 superb technical surgeons as well as warm human beings. The unit also included a psychologist, social worker, as well as the EEG technologists. Under Dr Lombroso's leadership, its organization was a forerunner of what later came to be called Comprehensive Epilepsy Centers.

We ran an epilepsy fellowship, which attracted many from around the world—Natalio Fejerman from Buenos Aires, Toru Kurokawa, and Genjiro Hirose from Japan, Nicole Symann-Louette from Belgium, Norberto Alvarez from Argentina, and many others. The seizure unit also had an EEG technologist training program, in which we also taught.

These were the early days of surgery for epilepsy, before computed tomography (CT) and magnetic resonance imaging (MRI) brain scans. We developed our Wada test protocol based on the Montreal Neurological Institute's approach, thanks to Giuseppe Erba and his wife, Valeria, a neuropsychologist, who had trained with Brenda Milner. The EEG technology support was superb, led by Carol Van Velzer, John Barry, and Nancy Logowitz.

The other big project I instituted, with the invaluable help and advice of Peter Wolff, Chief of Research Psychiatry at Children's Hospital (see Figure 2D), was the Learning Disabilities (LD) Clinic. The concepts of "minimal brain damage" and "minimal brain dysfunction" had evolved from the observations of hyperactive children with known brain damage, as in cerebral palsy or encephalitis. School systems were becoming aware of children with specific learning disabilities, having been prodded by a new law in Massachusetts, Chapter 766, which was the forerunner of PL 94-142, the education for all handicapped law.

The LD Clinic became an intellectually stimulating multidisciplinary forum, an inspiration for research ideas, as well as a diagnostic service, because of the newness of the field and the caliber of people involved—Jeanne Chall's reading research group at the Harvard Graduate School of Education, mathematicians from Massachusetts Institute of Technology (MIT), Maria Marolda, a math specialist and educator from Simmons College, neuropsychologists, Natalie Solle and Jane Holmes, Tony Bashir, Speech and Language pathologist—all being critically questioned by Peter Wolff, and organized by our able coordinator, Rose Dashesky. The staffings usually involved invited special educators from the schools, so our findings could be translated into practical approaches in the classroom. When I finally left Children's Hospital, I recruited an old colleague, Martha Denckla, to administer the program.

One of my most memorable learning experiences was the yearlong participation in the Reading Forum of the White House Conference on Children, consisting of about a dozen experts—university reading researchers, the superintendent of the Chicago public schools, the executive director of the International Reading Association (IRA), and others, which culminated in our presentation in Washington, DC in December 1970 on recommendations on how to improve literacy and remediation of reading disabilities in the nation's schools. This occasion was the nearest I have ever come to becoming a producer of a play. The various forums had been asked to present their findings and recommendations in novel ways. I arranged for a then little known improvisational theatre group from Cambridge, Massachusetts, The Proposition, to perform a one-act playlet, which they improvised from our written report and verbal suggestions. It was a hit. Some members of the group, Judy Kahn, Jane Curtin, and Josh Mostel, went on to performing careers in television and Broadway.

My more significant early career papers from my Children's Hospital days were the first description of acute confusional migraine,² an early clinical differentiation in gelastic epilepsy,³ the paper that brought to attention what was later to be called Landau-Kleffner syndrome,⁴ and a clinical paper on what was later to be neuraminidase type 1 deficiency.⁵

We often learn from our patients as much, if not more, than we give them. Perhaps my most memorable patient was R.C., a teenage boy with easily controlled seizures. More importantly, I documented his developmental dyslexia, as well as his arithmetic disability, and worked through high school with his vocational school teachers to compensate for his learning disabilities. He was a bright student who excelled in sheet metal work, and I had developed a close relationship with him and his mother. Shortly after his first job in construction, while working on a building near the Massachusetts General Hospital (MGH), he fell and died and was brought to the MGH emergency room. I received a stunning phone call from Dr E. P. Richardson, who found out I was his neurologist, informing me of his death. He asked whether the brain was worth studying. Knowing that there were no studies to speak of, at that time, documenting any anatomical abnormalities in dyslexia, I said by all means, even though I was still reeling with shock to hear that someone who had just achieved a modicum of success after struggling so long had his life unexpectedly snuffed out. Richardson sent the brain to Thomas Kemper, then a neuropathologist at Boston City Hospital. Detailed serial sections revealed polymicrogyria in the left temporal speech region, and cortical dysplasias in the left limbic, and association cortices. The resulting publication was the first breakthrough documenting neuropathological lesions in developmental dyslexia.⁶

**Two roads diverged in a wood, and I
I took the one less traveled by**

And that has made all the difference.

—“The Road Not Taken,” Robert Frost

The University of North Dakota (UND) medical school in Grand Forks had expanded from a 2-year school, which had existed as far back as the Flexner Report, into a 4-year school aimed at producing family practitioners, during President Richard Nixon's administration. Bill Olson was the pioneering first Chair of Neurology, who had been recruited from Vanderbilt University. He recruited me, and we subsequently recruited Roger Brumback from Pennsylvania, to be Chief of Neurology at the Fargo VA Hospital. Even at that time, Roger's long-term dream was to publish a journal. He subsequently left for neuropathology training in upstate New York, then moved to Oklahoma City. In addition, readers of this journal know the rest of the story.

In contrast to my previous experience in academia, our main educational thrust was medical students. We had to build a neuroscience/neurology curriculum for generalists, beginning with the first year, through the fourth year. I learned about undergraduate medical education, and the needs of family practice residents for neurology training, because there were 4 UND family practice centers spread throughout the state. This was still in the pre-CT scan days, so taking a good history and performing a competent exam, and the ability to put it all together, in other words, bedside clinical skill, was paramount.

These teaching needs lead Bill Olson to conceive of a book for nonneurologists at a medical student and resident level, a practical manual that could be carried in a coat pocket or medical bag. The first edition was published in 1981.⁷ After 3 editions, the original authors (Olson, Brumback, and Gascon; Christopherson had died) turned over subsequent authorship to proteges of Olson at Louisville⁸ with the same teaching needs in mind, I produced, with the UND Audio-Visual Department, a series of videocassettes on the neurological exam.⁹⁻¹¹

The Medical Center Rehabilitation Hospital was part of the university and was just starting a Child Evaluation and Treatment Program (CETP) for developmentally and learning disabled children. As the Medical Director of the CETP, this gave me an opportunity to learn how rehab hospitals do teamwork. We performed multidisciplinary, interdisciplinary, as well as transdisciplinary evaluations, which, at that time, was well reimbursed.

I became part of the Child Neurology Society nosology group charged with sorting out the various diagnostic terminologies being applied to learning and behavioral problem, because we thought the *Diagnostic and Statistical Manual of Mental Disorders* (Third Edition [DSM-III]) classification, from a brain point of view, was unsatisfactory. It was again, a stimulating group, among them were Isabel Rapin, Ron David, Ruthmary Deuel, Ben Shaywitz. Subsequently, Rapin was awarded a National Institutes of Health (NIH) grant, to explore the language disorders of preschool children, to try and validate the classifications the Nosology group had come up with.

Although at times I felt out of the mainstream because we were not in a highly specialized tertiary care center, and distances to the prime pediatric neurology centers in the Upper Midwest, the Twin Cities, and Rochester, Minnesota, were far, I did enjoy some of the very informal, and sometimes raucous, meetings of the Ken Swaimann-led Upper Midwest Child Neurology Society, the colorful group that had founded the Child Neurology Society.

After Bill Olson left for Louisville, Kentucky, I succeeded him as Chairman of Neurology at UND. I was able to recruit Harry Whitaker, editor of *Brain and Language* and *Brain and Cognition*, to direct research at The Neuropsychiatric Institute. Both journals of higher cortical function were published out of Fargo while I was there.

I was able to recruit Don Goodkin to succeed Roger Brumback as Chief at the Fargo VA Hospital. Goodkin subsequently left for the University of California at San Francisco to carry on his productive research on multiple sclerosis.

I came to appreciate and admire the care that family practitioners were delivering to a rural population separated by long distances from the cities. They were competent in managing routine neurology problems, willing to manage medications, and had no hesitancy to call for help when necessary. The practice climate seemed a nostalgic persistence of the past. The old respect between doctor and patient was still sacrosanct, and independent farmers were proud to pay their bills.

Selected publications from this time are cited.¹²⁻¹⁵ Our second neurology resident at UND was Saad Al-Rajeh, who had graduated from King Faisal University Medical School in Al Khobar, on the Arabian Gulf in the Eastern Province of Saudi Arabia. This was the start of a long lasting relationship with the Kingdom for Bill Olson and me. We did visiting professorships in Al Khobar in the early 1980s, 2 weeks at a time, teaching clinical neurology to medical students, half of whom were women. Al-Rajeh finished his residency at the University of Louisville, when Bill Olson moved there to be chairman, and subsequently became the first American Board-certified Saudi neurologist, and ultimately Professor and Chairman of the first Department of Neurology in the Kingdom, at King Faisal University (see Figure 4A).

I subsequently spent a sabbatical at King Saud University Medical School in Riyadh, in the central Nejd area of the Kingdom, ostensibly to work on the first edition of our book. Fahd Abdul-Jabbar was the dynamic dean. This experience turned out to be another serendipitous event, as the first Chairman of Neurology was Chrisostomos (Tom) Panayiotopoulos. Also doing a sabbatical was Milne Anderson, at that time chair of neurology at Birmingham, England. Karl Astrom, who at MGH, first described with E. P. Richardson, progressive multifocal leukoencephalopathy, was also a colleague there.¹⁶ Tom helped elucidate the syndrome of juvenile myoclonic epilepsy¹⁷ and was beginning work on a syndrome of benign occipital epilepsy, that later took his name.¹⁸

In the meantime, Pinar Ozand had arrived across town at the King Faisal Specialist Hospital & Research Centre-Riyadh (KFSHRC-R), having already had a full career, helping to found the Hacettepe University medical school in Ankara, Turkey, then working on the faculty at Washington University in St Louis, and the University of Maryland. I had been seeing patients whom I knew had various kinds of progressive neurometabolic diseases but could not find laboratories to prove the diagnoses. Ozand and I started Neurometabolic Rounds, where pediatricians in 4 of Riyadh's hospitals rotated in presenting diagnostic puzzles to us. I discussed the clinical findings, my diagnostic impression, and the differential diagnoses.



Figure 4. Saudi proteges and colleagues. A, Saad Al-Rajeh. B, The author, Soad Yamani, her husband Ali Al Lehbi.

Ozand then developed the assays necessary, and we started documenting all kinds of storage diseases, aminoacidurias and organic acidurias.

After my sabbatical, I returned to UND, but after a year was recruited back to Riyadh, this time to KFSHRC, by a persistent and convincing Abdul-Jabbar, who had now been appointed CEO of KFSHRC-R by King Fahd. I joined Ed Rabe, who had just retired from Tufts University Medical School and the Boston Floating Hospital, to start a pediatric neurology service at KFSHRC. Ed kept a patient diagnostic database of every patient he saw. When he left after 2 years, I picked up that habit and continued it, right through my days in Riyadh, Providence, and Jeddah. Databases became an important resource for clinical publications.

I started the first pediatric neurology fellowship in the Kingdom at KFSHRC-R, which is still ongoing. Jay Cook, Hernan Posas, and later Omar Dabbagh joined me. The training model was that of the training requirements for child neurology training in the United States. Our first fellow, Soad Yamani, who helped carry out our first treatment study of subacute sclerosing panencephalitis,¹⁹ subsequently did an epilepsy fellowship at Boston Children's Hospital, then finished child neurology training at MGH. She returned to KFSHRC-R, after training, eventually headed the child neurology division, and presently is a moving force for establishing national organizations for attention-deficit hyperactivity disorder (ADHD) and autism (see Figure 4B). Our second fellow, Aysha Yaghmour, spent 2 years at Northwestern

University in Chicago to finish her training, and then stayed on for molecular genetics training in Teepu Siddique's laboratory. The specific purpose was to find the genetic basis of primary lateral sclerosis, which affected 3 children in 1 family we were caring for. This later found fruition in the ALSIN gene story.²⁰ Our third fellow, Ahmed Jarallah,²¹ finished his training under Steve Roach in Dallas, returned to King Saud University, and was heading a research project on autism at the time of his untimely death.

Concomitantly, Ozand built a clinical laboratory research team that discovered an abundance of genetic neurometabolic diseases that are rare in the United States and published numerous papers on genetic neurometabolic diseases.^{22,23} Subsequently, Ozand evolved from biochemical to molecular genetics. He founded the first department of research genetics in the Kingdom at KFSHRC-R, which today, after his retirement to Istanbul, is carrying on state-of-the art molecular genetics research (see Figure 5A).

With every adversity, there lies an opportunity.

– Anonymous Chinese proverb

In the meantime, Desert Shield and Desert Storm left us with a lot of time on our hands, because many patients were unable to travel to Riyadh for clinics. The roads were heavy with military traffic, and over 25 Scud missiles from Iraq landed in Riyadh and the Eastern Province. So, we took the time to consolidate and publish our work.²⁴

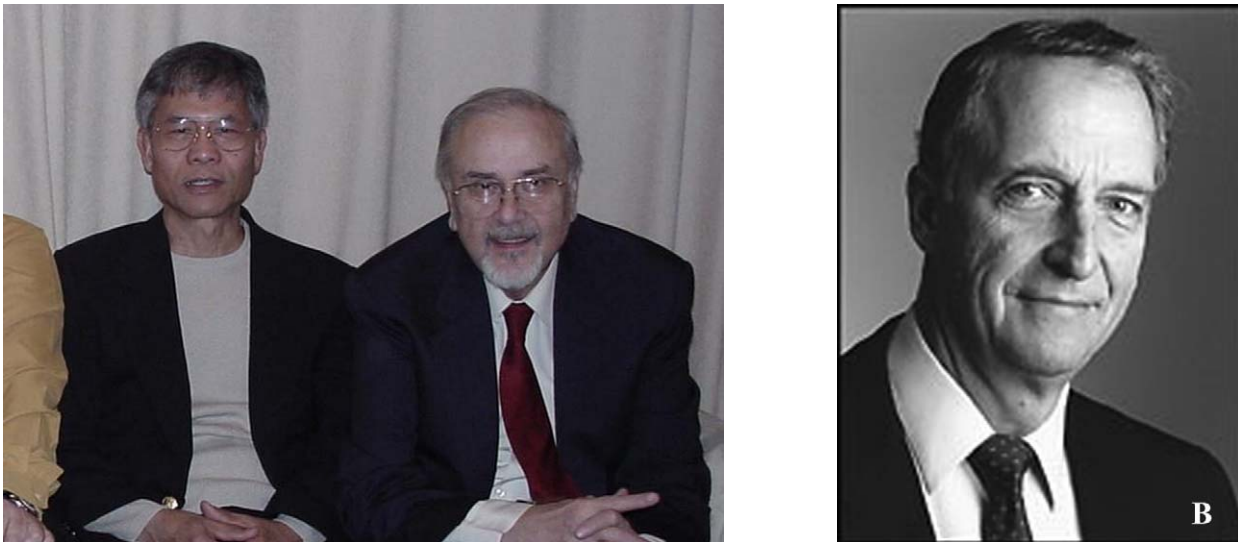


Figure 5. Mid and late career colleagues. A, Pinar T. Ozand, King Faisal Specialist Hospital & Research Centre, Riyadh. B, John Girvin, King Faisal Specialist Hospital & Research Center, Jeddah.

Another serendipitous event was the discovery that subacute sclerosing panencephalitis (SSPE) was endemic in the Kingdom, because measles vaccination had not been universal till the late 1980s. We published results of our treatment, using intraventricular alpha interferon and oral isoprinosine, about the same time as the Ankara group¹⁹ I had discovered that they were working on the same treatment as us, at the joint 1990 International Child Neurology Association—Asian and Oceanian Congress of Child Neurology (ICNA—AOCCN) international meetings in Tokyo, where Soad Yamani, Janice Crowell, our superb chief neurophysiology technologist, and I were presenting our work. That meeting, chaired by Yukio Fukuyama, provided another opportunity for my professional development through his gracious interactions with me in the Asian and Oceanian Child Neurology Association and the journal *Brain and Development*.

The other memorable experience of the Riyadh days was having Jean Aicardi as a Visiting Professor for a month. We presented to him several Aicardi syndrome patients (several of which he deemed were not), as well as AOA patients (ataxia-oculomotor apraxia), which he clinically agreed with.²⁵

If you come to a fork in the road, take it.

— Yogi Berra

In returning to the United States, I had 2 options—Oklahoma City or Providence, Rhode Island. Roger Brumback had invited me to look at a new endowed chair at the University of Oklahoma for child neurology. I liked the

whole set up there and the idea of reuniting with Roger, especially at a time when managed care was putting a crimp on finances in academic medicine. However, with my wife Susan's mother becoming older and the need to be available, we decided on Brown University and Rhode Island Hospital (RIH).

My first task was to start the first child neurology division at Brown University, within the Department of Clinical Neurosciences, chaired by Donald Easton. Gerald Exil and William D. Brown joined me. We started a pediatric neurology residency, with June Caruso as our first resident²⁶ and Ray Ferri as our second. Ray subsequently did a fellowship at NIH with Roscoe Brady's group and is presently in Syd Gospe's department at the University of Washington. Years later, upon retiring from Brown University, I recruited David Mandelbaum to succeed me.

The first memorable accomplishment was to start a Comprehensive Epilepsy Program, with John Duncan as the neurosurgeon. Andrew Blum was recruited from Steve Schacter's program at the Beth Israel Hospital in Boston, making available epilepsy surgery and vagal nerve stimulation as treatments for children and adults, in addition to the latest antiepileptic drugs. We were able to publish a long-term follow-up of one of my original Landau-Kleffner patients.²⁷

To bring awareness and support services to families and children with epilepsy in Rhode Island, I pushed our community group to merge with the already well-established society in Boston, and thus, the Epilepsy Foundation of Massachusetts and Rhode Island was born.

I learned a lot from Henrietta Leonard, who along with Sue Swedo and others first described pediatric autoimmune neuropsychiatric disorders associated with streptococcal infection (PANDAS) and had come to RIH from the National Institutes of Mental Health to head the triple board program (Board certification in pediatrics, child, and adult psychiatry). We started a Developmental Neuropsychiatry Clinic in which her residents and mine saw patients with neurobehavioral/learning/developmental problems, presented them to both of us, and then we discussed from a neurology and a psychiatry point of view. Curt LaFrance has inherited the relationships we developed with school systems and is in the process of publishing the examination for minor neurological dysfunction that I had devised.²⁸

My principal research project during the Brown University years was directing the international treatment study on SSPE, a clinical trial which involved coordinating investigators in Manila, Mumbai, and Ankara. Planning meetings had started abroad, the protocol finalized after I was at Brown, but the findings were not published until I had left Providence for Jeddah.²⁹

Jeddah, the Bride of the Red Sea

During my Providence years, I returned to Riyadh annually to go over data from the SSPE project with our data tabulators and analysts at KFSHRC-R. While there 1 year, I was asked to visit Jeddah, on the West Coast of the Kingdom, where another hospital had been added to the King Faisal Specialist Hospital system. John Girvin (see Figure 5B), neurosurgeon from the University of Western Ontario in London, had just been recruited to start the Department of Neuroscience.³⁰ His main goal was to start an epilepsy surgery program. Convinced through his dynamic personality, I bought into his goal and therefore "retired" to Jeddah after leaving Brown.

An epilepsy program was successfully started, built around the usual models in North America. Multidisciplinary staffing videoconferences were held jointly by the Riyadh and Jeddah groups, involving neurologists, neurosurgeons, neuroradiologists, and neuropsychologists, during which long-term monitoring EEGs, MRIs and positron emission tomography (PET) scans were displayed. Dr Girvin operated at both King Faisal Specialist Hospitals, in Jeddah and Riyadh, in both children and adults. I did the first vagal nerve stimulation programming in the country. We started an active ketogenic diet therapy program.

My pediatric neurology colleague, Mohammed Jan, who had trained with Peter and Carol Camfield in Halifax, Nova Scotia, Canada, started a unique 1-year pediatric neurology fellowship for general pediatricians, in response to the overwhelming need for expertise in managing the great number of routine child neurology patients in the Western Province. Ministry of Health pediatricians were

sponsored by their home hospitals, to return to start general pediatric neurology clinics, but with the opportunity to consult with us at KFSHRC-J for complicated problems requiring tertiary care.

Working on the Board of the ICNA was another enjoyable, professionally enhancing experience (see Figure 6). It was first-hand experience of the globalization of medicine—meeting child neurologists from the developing and developed world in their countries, advancing professional education and training, and using internet communications technology, for information transfer particularly in the developing world, as in the establishment of a child neurology knowledge environment (ICNApedia; <http://www.ICNApedia.org>).

By far, the most exciting research collaboration during the Jeddah years was with Christopher Walsh's neurogenetics research team and lab at Harvard Medical School. The main project was the search for autism susceptibility genes, through Chris's NIH-funded research grant. He decided to take a different approach than most researchers who were doing whole genome scans in families in North America and Europe. He reasoned that with the kind of population in the Middle East—consanguineous parents, large families, many with more than 1 affected child, that the chances of finding such genes in a population was much greater, using homozygosity mapping, even though the genetics of autism is complex and non-Mendelian. Soher Balkhy, developmental pediatrician, and I essentially were case-finders, participating the way clinicians can do in genetic studies, by making sure the phenotypes were tight. The results have recently been published.³¹ Other more traditional studies involved finding mutated genes in congenital brain malformations and microcephaly vera, working with Ganesh Mochida from Chris's lab and MGH.

The Jeddah years ended with me reluctantly assuming administrative duties that I did not seek or relish, but despite which I learned things I otherwise would not have. I wound up chairing the Department of Pediatrics (see Figure 7) for 2 years, and the Research Center for about a year. My task was made especially difficult, because, it turns out ironically, as with the restrictions of managed care in the United States, which I thought I had escaped, the hospital was facing financial shortfalls, and we had to do more with less.

**Oh beautiful for spacious skies
for amber waves of grain
for purple mountains majesties
above the fruited plain**

— Katherine Lee Bates

North Falmouth on Cape Cod has been our safe harbor since 1990, a refuge for the family to sit out Operation Desert Storm, the site for the McInnis Open, our annual family reunion centered around a best-ball golf



Figure 6. Executive Board of the International Child Neurology Association, 2002 to 2006. Beijing meeting. Front row: Hugo Moser, David Stumpf, Paolo Curatolo, Orvar Eeg-Olofsson Rear, left to right: Makiko Osawa, Charles Newton, Hugo Arroyo, Xi Ru Wu, Sergio Rosenberg, Mike Shevell, Philippe Evrard, Peter Baxter, Ingrid Tein, Ian Wilkerson, Yoshiyuki Suzuki, Masaya Segawa, Generoso Gascon, Raili Riikonen, Shaul Harel, Veena Kalra.

tournament, and the place to which I have returned to downshift into a country doc lifestyle, doing part-time practice as a member of the Neurology Department, Pediatric Neurology division, at MGH. My improbable odyssey would not have been possible without the opportunities for quality education in superb institutions.

I feel fortunate to have witnessed first hand, from coast to coast, the transformation of the Kingdom of Saudi Arabia (KSA), from its concentration on internal development of infrastructure during the post-oil boom days of the 1970s and 1980s, to its assertive entrance into the Middle East peace process with the King Abdullah Peace Initiative of 2002, subsequently adopted by the Arab League, and welcomed by Israeli leaders during the United Nations General Assembly meeting, November 2008. I came to admire a society with a growing, educated middle class that saw the need to modernize rapidly and become more open, without losing its cultural and religious values, doing it in fits and starts, but nevertheless, progressing. I am forever grateful to my colleagues in Riyadh and Jeddah, both physicians and residents, as well as nurses, secretaries and other ancillary staff too

numerous to mention, for making me feel at home in their professional community and helping establish pediatric neurology as a specialty in the country. I am indebted to the numerous patients and families for whom I was fortunate enough to care for, who reinforced an often underappreciated fact by outsiders to whom Saudi society seems impervious, about universal values, that the prime social unit in Middle Eastern society is the family, nuclear and extended, and that children are cherished.

What made the Riyadh years enjoyable was not having to sacrifice family for profession. We had plenty of quality time with our 2 younger sons, Phil and Doug, while they attended the excellent international school—weekend desert picnics and camping, weekend sports programs, flying to Dubai for tournaments with our youth ice hockey team, the Riyadh Oilers, and having the opportunity to travel in Europe, the Middle East, Asia, and Africa. To this day, we keep in touch with friends from Canada, Europe, the Middle East, and Saudi Arabia.

I am forever grateful to have the loving support of a wife, Susan, a native Bostonian, who was willing to travel to the ends of the earth with me, and without whom



Figure 7. Pediatrics Department, King Faisal Specialist Hospital & Resarch Center, Jeddah. November, 2005—From Left to Right—Back row: Mrs Rufina D'Mello, Dr Omar Abu Sa'da, Dr Ali Mersal, Dr Mahaboob Basha, Dr Fadi Abdelrahim, Dr Mohamed Abdel-Wahab, Dr Abdullah Al Ghamdi, Dr Ihab Attili, Dr Alaa Hegab, Mrs Linda Jay. Second row: Ms Abeer Bakr, Dr Amina Khider, Dr Mohsina Mohammed, Dr Widad Fadlemula, Dr Riham Abu-Rajela, Dr Vineeta Wal. Front row: Dr Doris Taha, Dr Soher Balkhy, Dr Generoso Gascon (Chairman), Dr Amira El Tantawy.

I could not have taken the roads less traveled. She adapted to the greatest cultural shock in her life, not moving from the United States to Kingdom of Saudi Arabia, but from urban Boston to rural North Dakota. North Dakota gave us a sense of what "community" means, and to this day, we retain affection for friends made there, the Upper Midwest in general, and particularly, the UND ice hockey teams, perennial Frozen Four finalists.

My 2 older children, Christopher and Celeste, weathered a disruptive move during their junior high school years from Newton, Massachusetts, to Grand Forks, North Dakota, survived, and thrived. They are now comfortably settled in Syracuse, New York and Duxbury, Massachusetts. Through them, we have 4 grandchildren, whom we now enjoy seeing grow up. As in Roberto Benigni's film—*La vita è bella!* Life is beautiful!

Acknowledgments

David Stumpf furnished the photos of the 1970 Longwood Neurology Program and of Charles Barlow. Copyright

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