

A watercolor illustration of a landscape. On the left, a large green tree with dark green foliage stands in front of a white building with a dark roof. The ground is depicted with various shades of green, yellow, and purple. The background is a light blue and white wash.

Nita Regnier

***Memoir
Writing
Group***

Selected Writings

Volume Two



Association of
MIT Retirees

Cover Illustrations

A Scene in Western Massachusetts (front cover)

Alley in Casacalenda (back cover)

Lucy Wilhelm

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Bioengineering at
MIT – A Long Labor
and a Painful Birth

Laurence Retman Young
Edited by Leslie Young

Introduction

I write this introduction not as a member of the MIT retiree memoir group, but as the daughter of long-time member Larry Young, who began writing his memoirs in 2015. In 2020, he was diagnosed with cancer, and went into home hospice in January, 2021. Throughout the winter, spring, and into the summer, at every stage of his illness, the memoirs were one of his greatest sources of pleasure—editing the 90,000-word manuscript, thinking about ways to get the document out into the world, or simply having it read to him.

Why were memoirs so important to him during this time of transition, perhaps near the final transition? And why might they be valuable to us all? As shown in this collection, memoirs can be powerful for several reasons.

Memoirs can be reminders of a life well lived. Within the memoirs are our most glorious days, our most delightful discoveries, our dearest friends, our closest family. Rereading the drafts has helped Larry keep a sense of gratitude even as times get harder.

Memoirs can be a legacy. Larry wrote this work largely for his children, grandchildren, and unborn great-grandchildren. Knowing the memoir will last beyond him and touch others has helped Larry keep a sense of peace.

And memoirs have some astounding stories!

My thanks go out to this wonderful group. May all your transitions be as easy as possible.

Leslie A. Young

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Writing from Memory

Daphne Strassmann

Memoir, the transformation of life into story, is an unmistakable equalizer because we all share moments to record or retell. We do so daily, relating the mundane or spotlighting the extraordinary to a captive audience of coworkers, family, friends, strangers, or partners. Webster's dictionary defines memoir as "a narrative composed from personal experience," but it is how a writer remembers their "personal experience" that transforms the narrative into a compelling story.

Writing about our pasts transfigures the writer into both a narrator and the main character, so memoirists experiment with ratios of intimacy and detachment. Others around us appear as secondary characters. Fueled by memory, unwilling plots emerge replete with a setting, conflicts, and maybe resolutions. In the solitude of writing memoirs, we revisit our lives and inhabit the presence of places long forgotten. We excavate our past to find pieces of who we were, and for a moment, in the span of a few paragraphs, our lives can reflect a transformed reality, expansive and textural.

When the writer shares a personal narrative with a reader, as our writers do in this volume, we instantaneously grasp the allure of their stories. We admire and secure inspiration from their adventures, rekindle our own, invoke that same ethos in the future, and connect in their mournings or celebrations with an insider's knowledge. As memoirists envelop us in sensory details, we too inhabit spaces, conjure up sounds, taste an old family recipe, retreat into stillness, or work to decipher a thorny moment. Memoir stays with us because the stories entertain beyond the formulary edict of dates and places; instead, we get the tenor of a life being lived.

What you will see in these pages starts in the solitude of the writing, yes. However, I find it difficult to relate, in scant words here, the vulnerability that a writer must materialize to share uniquely personal stories with others, no matter how friendly a community. In our group, writers generously probe, often asking what poet David Whyte calls "the beautiful question," the one which sends the writer, and the group, to deeper examination. Our group will often invite a writer to substitute a word or two, but a workshop's generous inquiry usually reveals unplumbed realities. The discoveries of untapped possibilities in a layered story, as well as the words that fit "just right," have nurtured the stories you will be reading in this second volume.

There are times when we leave a certain past behind, either by circumstance or choice, and embrace a new reality. We evolve. The Nita Regnier writers faced turning points and reanimated those into stories that reflect their history. They paint for us a vivid sense of who they are today, who they were then, and what preoccupied them. They are leaving a trace. For their families and us, their readers, it is a gift.

The next time the scent of a well-cooked meal transports you to a resonant memory of your childhood kitchen, or a song delivers you to a tender moment, open up your computer, grab a pen, or dictate into a voice recorder. Start with that restless memory, the one your brain hasn't been able to shake, and write it down as you recall it. Freeze and stretch time visiting previous versions of yourself. Resist the temptation to rescript. The imperfection of memory is an intriguing friend; follow her invitation. We need your stories now more than ever.



About Daphne Strassmann

Daphne Strassmann is a memoirist who writes about the liminal spaces between her Latino heritage and American life. Currently, she is a visiting lecturer at the Massachusetts College of Art and Design and an instructor for Grubstreet, the Center for Creative Writing. Strassman founded "Rekindle Your Craft," a community writing project that invites writers of all genres and levels to cultivate imagination through writing. Her teaching encourages students to work from spaces of authenticity to reclaim experiences of aesthetics, cultural expression, and purpose.

Strassmann holds an M.F.A. in Creative Writing with a concentration in Creative Nonfiction from Lesley University. Her work has appeared in the Creative Nonfiction literary journal, GrubWrites, Tex{t}Mex, and textbooks.

She is delighted to work with the Nita Regnier writers.

Mushrooms On My Mind

Elaine Shiang

Learn, evolve, have fun.

*These were my thoughts after leaving MIT
in 2019.*

*I wasn't sure how to make these ideas
happen but somehow, nature and
community interest intersected.*

*Although I generally don't write for
public reading, I decided that the MIT
Memoir Writing Group was the best place
to start writing about this multi-year
community adventure.*

Yes, I grow mushrooms. I am a mushroom farmer. When I tell people this is what I am doing in retirement, they hesitate for a moment. Then come the questions.

“Mushrooms? How did you get interested in mushrooms? How did you learn to grow them? Is it something you’ve been doing for a long time?”

And finally, always at the end, “Do you grow magic mushrooms?”

As a young child, my fondest food memory was drinking mushroom soup prepared by my mother. Creamy, velvety, hot, with small chunks of mushrooms, it was satisfying and comforting. And, for someone who has recently learned to care about sourcing food from local farms, I can only chuckle when I remember that it came from a Campbell’s soup can.

My parents, immigrants from China, weren’t above tapping into efficiency as long as it came with deliciousness and nutrition. Besides, at that time there were few fresh mushrooms in supermarkets. Mushrooms were sold in cans of brine, and farmers markets did not exist in our local neighborhoods.

Two decades later, on my first trip to Beijing, I met my cousin who was Professor of Mycology at the National Academy of Agriculture. She showed us her research projects where she was cultivating large trays of mushrooms. Then, she took us to a flute maker in the suburbs whom she was teaching to use discarded wood shavings as a substrate for mushroom cultivation. I had no idea one could grow mushrooms on wood chips. At the end of the tour, she invited us to a small, unpretentious restaurant in northwest Beijing where 20-30 trays of mushrooms were arrayed behind a refrigerated glass counter. Peering carefully into the case, I could identify only shiitake and wood ear species. My cousin selected many varieties for a tureen of hot soup. When we arrived at the circular dinner table, a scrawny but large, black skinned “silky” chicken lay nestled amongst the mushrooms in the hot pot. The entire meal was delicious, and even more memorable after we learned this restaurant was Henry Kissinger’s favorite.



I started thinking about a mushroom growing project a few years before retiring from MIT in 2017. I knew that having a retirement project was a good idea, and I recalled how gardeners got a special kick from transforming their yards. However, I wasn't interested in flowers or vegetables. Perhaps something different?

It occurred to me that our land in New Hampshire might have some potential. Back in 1981, my husband and I bought a small vacation home just an hour from Boston. It had six acres of partially swampy land that lay dormant. Maybe the property could be repurposed?

I surveyed the land with a worker from the New Hampshire Department of Forestry. He agreed that culling and cutting down small trees might be beneficial. And he confirmed that we had plenty of young oak trees, which were best for growing shiitake.

In 2017, I took a trip to the annual Telluride mushroom festival in Colorado. I learned mushroom cultivation methods and their use in medicinals and pharmaceuticals. I was fascinated by the stories of Philadelphian farmers growing mushrooms on recycled coffee grounds and retirees growing oyster mushrooms in their mobile homes. New research studies were presented on the use of psilocybins as treatment for intractable chronic anxiety and depression. A scientific journal had just published the findings that psilocybins interacted with serotonin, a neurotransmitter in the brain, and might be useful as adjuncts for future antidepressant medications. As a physician in my earlier life, I found this news very exciting, as non-toxic and long-acting treatments for anxiety and depression are very much needed.

I continued reading and planning. It was clear that I needed a partner, preferably someone with both knowledge and vigor. I started searching for an "urban lumberjack."

Through my daughter, I heard of Tris, who was selling microgreens to her restaurant in Boston. When I asked Tris if he was interested in growing mushrooms, he mentioned his personal experience growing shiitake mushrooms on outdoor logs and psilocybin mushrooms in his basement. He knew how to use a chainsaw and liked classical music. The combination seemed unbeatable.

As the chief farmer for the Urban Farming Institute in Mattapan, Tris had a ready-made sellers market. He recommended that I read

the 2014 book *Farming the Woods* by Mudge and Gabriel, two agriculturists at Cornell University. Interestingly, my daughter gave me this book several years earlier along with a Christmas gift of an inoculated shiitake mushroom log from Cornell. Too busy to read the book or the instructions that came with the log, I threw the log into the backyard. Two years later, after I read the instructions, I resurrected the log. Amazingly, after being ignored for so long, it started to fruit with proper hydration methods!

Armed with the assignment to learn how to grow outdoor shiitake, I read how to select the proper size oak trees and cut them in the spring, when they were just coming out of winter dormancy. After cutting the tree into three-foot logs, drilling approximately 40 holes into each log and inoculating with mushroom spawn, the final step was to top off each hole with wax. I learned that five-inch diameter oak trees were ideal because the ratio of sapwood to heartwood was higher. Sapwood is the outer ring of the tree, which functions to transport water whereas heartwood does not transport water. And the more water transport, the better the spores can migrate throughout the log. I read how to stack the logs, shade them in the summer and winter, and monitor them with moisture meters.

By 2018, we were ready to begin our project. We headed to Kingston in February while there was still snow on the ground. In bright orange lumberjack gear, Tris and his friend Joe (on the right) cut down six oak trees, and accidentally, one maple tree. Without leaves on the trees, we couldn't tell the difference.



Tris and Joe in lumberjack gear.
Photo: Elaine Shiang



Tris preparing to cut an oak tree.
Photo: Elaine Shiang

We stacked 70 logs and waited for them to cure (giving the logs time for their natural fungal inhibitors to dissipate before inoculation).

Four weeks later, members of my book club and other friends joined us for the inaugural inoculation event.

With electric and hand drills equipped with 5/12-inch bits, we drilled about 40 holes in each log and then, with our handmade brass inoculators, stuffed each hole with cold weather Shiitake spawn (mushroom spores or mycelium in sawdust).

A member of my book club inoculated the logs with such seriousness that she developed temporary repetitive stress injury in her thumb.



The inaugural inoculation in 2018. | Photo: Elaine Shiang



Tris at the paraffin table.
Photo: Elaine Shiang

Tris made sure that all the holes were topped with paraffin wax to prevent leakage or contamination of the mycelia.

Our handbook said to wait approximately nine to twelve months before the mushrooms fruited. However, I received a call from our tenant in New Hampshire that “weird things” were “popping out of the logs.” Apparently, after the snows of late November and a subsequent mild temperature spell, the mycelia had fully migrated throughout the logs. Those “weird things” were tiny shiitake!



Our surprise seven-inch winter shiitake!
Photo: Elaine Shiang



Jenny preparing extra large fresh mushrooms.
Photo: Elaine Shiang



A delicious mushroom and red pepper stir fry. | Photo: Elaine Shiang

And, some had grown over seven inches because we were not paying attention.

The optimal restaurant eating size was three to five inches, but everyone loved the large mushrooms which were just as edible. Jenny created a mushroom and red pepper stir fry, and my granddaughter carefully sliced the mushrooms I brought to her kitchen.



Granddaughter Kira learning how to slice. | Photo: Elaine Shiang



Oak logs with fruiting shiitake.
Photo: Elaine Shiang

Further harvests yielded over 20 pounds which we sold at Tris' farmers market and Meimei restaurant, which created "Singapore Shiitake" mushroom dumplings. Extra bounty was set aside as small gift boxes for book club friends and team members.

In 2019, we invited a group of 20 new people to join us. On this occasion, the leader of my ping-pong group commandeered the drill. Tall and with a straight back, she drilled 40 holes in 75 logs almost single-handedly.

In early 2020, just as we were planning our third inoculation, the coronavirus pandemic threw all plans into disarray. Tris, however, insisted on cutting trees and continuing production, provided we take extra care. His friend Joe again volunteered to help, and Jenny (pictured in pandemic gear) and I rejoined them two weeks later to complete the inoculation. Our crew of four worked in multiple shifts over several days, but we were able to finish the inoculation before the logs dried out.



A new group of helpers drilling holes for the inoculation. | Photo: Elaine Shiang



Jenny in pandemic gear, March, 2020. Photo: Elaine Shiang

In March 2021, we hosted our fourth inoculation event. Although we were cautious and nervous about the ongoing pandemic, we agreed to proceed. A gathering of any volunteers would be a bonus compared to the prior year. And thankfully, many of us were fully vaccinated.

I spent months emailing my friends, explaining in detail our “socially distanced outdoor inoculation event.” To my surprise, 24 people signed up, including six of my physician friends. The eight children ranged in age from two to ten. After being cooped up for so many months, people were curious, and they wanted to be outside learning something new.

We ramped up our staging facilities and supplies to cope with the high number of logs (86) and volunteers. We bought a powerful 10,000 rpm/min electric drill and on the spur of the moment, I drove to Portland, Maine, to pick up additional brass inoculators. I spent the morning with Matt, co-owner of North Spore, touring his large mushroom spawn warehouse, discussing cultivation methods and the most recent Oregon legislation involving legalization of psilocybins.

The volunteers arrived early. I was getting nervous because Tris hadn’t arrived yet and he had the most of the gear and the spawn. When he arrived and saw all the volunteers clustered around the work sites anxious to begin working, I could see him start to tense up and get anxious. However, after observing that we had enough tables, extension cords, and tools for everyone to easily distance, he visibly relaxed.

After some initial havoc, the production line started to hum. Wood chips flew everywhere, and the children had teachers to help them learn how to use the inoculators. Two of my friends took over the paraffin table, and others labeled the logs.

We finished earlier than expected, giving everyone a chance to eat, relax, and play on the beach. The volunteers got to pick mushrooms from past inoculations. Even the six-year-old had a smile on his face when everything was completed. He gave me a kiss on each cheek.



Labeling the inoculated logs. | Photo: Elaine Shiang



Shiitake from a prior 2019 inoculation.
Photo: Elaine Shiang

I was ecstatic that our pandemic inoculation was successful. The beauty about mushroom cultivation is that after you do all the work and preparation, you leave the logs outdoors through the winter, making sure that they stay moist. And after nine to twelve months, you hope that the spores will mycelialize throughout the log and finally fruit into a delicate and edible mushroom.



And, what about “magic mushrooms”?

The use of psilocybins in the treatment of psychiatric diseases continues to gather public interest as results of new clinical studies are published. After a 50-year moratorium, medical schools and private organizations are receiving funding to conduct new research. And companies around the world are growing medicinal mushrooms. With Oregon taking the lead, other states are considering legalizing psilocybins for medicinal use.

And perhaps in the future, we will consider growing psilocybins on our six-acre plot in New Hampshire. Local, organic, and fully legal.



About Elaine Shiang

Elaine Li Shiang worked for 35 years as a physician, administrator, and teacher at MIT's Medical Department and Clinical Research Center.

She now cultivates shiitake mushrooms on her farm in New Hampshire and is a tennis and travel enthusiast. A week after retirement in 2017, she fulfilled a lifelong dream with a visit to the Australian Tennis Open before embarking on a round-the-world art tour.

To keep her travel dreams alive during the pandemic, she invested in a small Winnebago RV, delighting her grandchildren with its spaciousness and pop-top roof. A recent two-week RV trip across the country with her sister was a bright ray of sunshine this past summer.

She also volunteers at the Pao Art Center, part of the vibrant Boston Chinatown Neighborhood Center, and helps grow her children's new food businesses, Mei Mei Dumplings in Boston and Flora's Wine Bar in Newton.

Growing Up with Anthracite Roots

Ron Latanision

I have always wished that I knew more about my grandparents. I never met my maternal grandparents who were from Poland, near Krakow. My paternal grandparents were from Ukraine, near Kiev, I believe. They did not speak English. My grandparents taught some of my older siblings to speak and to write in their language, but as I was the youngest and my grandparents had grown older, I think they gave up trying to instruct us, and yours truly in particular, to speak the language. I have been close to my five grandchildren and have enjoyed the whole experience of being a grandfather. But it seems to me that a record of some kind that addresses my history might be useful to shore up their memories as they, too, age. So the following includes a personal story; a professional complement will follow.

Growing Up

I was born on July 2, 1942, the fifth child of Mary Kopach Latanision and Stephen Latanision. I believe, based on Ancestry searches, that Latanision is an anglicized version of what we believe to be the original spelling, Latanishyn. They are phonetic equivalents. We were all born at home at 527 Main Street in Richmondale, Pennsylvania.



Mom and Dad (Mary Kopach Latanision and Stephen Latanision). | Photo: Family Album

I had two older brothers, Steve and Tom, and sisters, Catherine and Marguerite. Richmondale was a town of about 100 people located about 20 miles northeast of Scranton, five miles from Carbondale, four miles from Simpson, and about one mile from Forest City. (These smaller towns will become part of this story). Neither my mother nor my father finished school, both leaving after grade five as I recall. Mom raised five kids and kept my dad in line for the most part. My dad had a temper, and my mom absorbed much of his discomfort. He was a coal miner, as were just about all the other males in town. Northeast Pennsylvania was anthracite coal country. Hard coal, as it is known, was also described as the blue diamond. While bituminous (soft) coal is burned in power plants to generate electricity, anthracite coal has the highest energy density of all types of coal and is used in the steel-making industry and in other metallurgical applications. Anthracite burns with a blue flame! In fact, when I was a kid, veins of anthracite coal were burning underground, and where the veins reached the surface, blue flames licked from the ground. The scene was surreal... the mind's image of hell if there is such a place! These underground coal fires had begun years before, creating sinkholes when the ash that was produced was unable to support the ground above and collapsed. I did not think much of all of this at that time... it was just the way we lived in the Lackawanna Valley. I suppose that I expected that everyone lived that way....

There was an 18-year separation between my oldest sister, Catherine, and myself. Tom is four years older than I am. Steve was a real cut-up, always full of life and energy. He teased me mercilessly. He used to also pick me up by my ankles, and lower me head-first (almost), into the new toilet that we had in our house when I was a little kid.

Our little village had a bar and one eclectic little store. Our home was small; there were two bedrooms. Tom and I slept in the same bed for a long time. It was a challenge, but better than no bed at all! I remember my dad coming home at the end of his shift in the mine (and after the obligatory stop at the bar) with a bunch of his friends, all of them black from head to foot with coal dust, white just showing through around their eyes. They wore goggles for eye protection, but inhaled coal dust each and every day. He died at age 45 of black lung disease. I was seven years old. For a while, doctors thought that he might have tuberculosis (this was before coal worker's pneumoconiosis was known), and so everyone in our home at the time had to be tested for TB. We were all negative, of course.



Me, 6 years old, with siblings Marguerite and Tom. (clockwise from left) | Photo: Family Album

The mines were so much a part of the life of Richmondale that my dad thought that his sons should also become coal miners and the girls housewives. When my oldest brother, Steve, who had been in the Coast Guard, decided that he wanted to go to college, my dad just about disowned him. But my mom prevailed! Although Dad did not know it, Mom had squirreled away some of my dad's pay, and when Steve was ready to go to Keystone Junior College, she gave him some

money and told him to go! He went to Keystone for two years and then transferred to Lehigh University for the final two years of his B.S. in mining engineering. Shortly thereafter, he took a job in West Virginia... and died in a mine collapse at the age of 27, leaving behind his wife and two kids. I was 13 years old at that point and I was really affected by Steve's death.

Even at age 13, I knew that he was too young to die. I convinced myself, using a mathematical progression which I constructed, that based on this history, I would not live beyond 17 if I went to work in the mines! It was at that moment that I determined that I was not going to become a coal miner. Although the mines were very hard on families (I do not recall any living fathers in my high school graduating class of 39 people), my affection for the Lackawanna and Susquehanna Valleys remains today, despite such history. In fact, the roughly ten-inch cube of anthracite that is in our living room in Winchester, MA, today has been with me... forever. I tell people that it is a reminder of my youth and my roots, which it is, but it is also a reminder of life as



The famous chunk of anthracite coal. | Photo: Ron Latanision

a coal miner's son and of life in our northeast Pennsylvania village. The people were essentially all Eastern European, and they were civil and respectful toward one another for the most part. The ideals of being civil and respectful have shaped my life.

My interest in coal as an energy source, along with nuclear electric generation and renewables, persists, though not in the current mode. Miners are safer today, but coal and fossil fuels have limits that the world must become willing to accept. It can no longer be acceptable to pump CO₂ relentlessly into the atmosphere if we want to mitigate climate changes that have now become conspicuous. I will have more to say about this in an evolving professional story that will follow.

One of my other favorite pastimes as a kid was... rolling outhouses. We did not have an indoor toilet when I was very young, but our family became one of the earliest in town to adopt that "convenience"! At any rate, along with some friends, we would wait until an older guy in town got in his outhouse and then roll it over, door facing down, so that the unlucky person would have to crawl out the bottom. We never got caught, though I think we were highly suspect! I also remember walking to movies on Saturdays in Forest City with my friends (it cost 12 cents to get in!) to watch cowboys like Roy Rogers, Gene Autry, and many others on the screen. Then we would come home and ride our (imaginary) horses in the woods surrounding our houses! My dad would occasionally take me by car to see a movie in Carbondale in an air-conditioned theater! As I mentioned, he had a temper! I remember one occasion when he became annoyed with someone driving in a car behind ours. He got out at a stop light and punched the guy squarely in the face! I don't know if there was more to the story, but it was stunning to me. My dad also brewed moonshine. We had a chicken coop in the back of our house that was used to produce chickens for Sunday dinner and eggs. Well, half of it was used to produce chickens and eggs; the other half was a gleaming assembly of copper tubes! I did not realize what function it served at that stage of my life, but I knew that something drinkable came out of this grand structure. So one day, some of my friends joined me in indulging in some of the product. We all became really sick! Dad and Mom were not amused. I believe that he brewed for himself and his pals until, one day, some guys stopped a car outside of our house, got out with axes and chopped up his still! That was the end of the brewery! He never rebuilt it!

I also have very vivid memories of a field/pasture that included a small pond. The pond was not really useful for swimming, but it was a great ice rink during the winter, when the cold north winds froze

it over. We skated there, played hockey... so to speak. And in the summer, the pasture served as a baseball field on occasion. There was, however, the one reality that this field also served as a pasture for cows! I am not sure who they belonged to, but I suspect that they were the property of the lady and her husband who supplied our un-pasteurized milk! The reality of all of this sunk in—literally—when playing baseball. Not only did we have to keep an eye on the ball but also on the ground, as the cows did leave their digestive and other metabolic products on our diamond. But the grass and hay provided such a sweet smell to the air that we could—with due process—find comfortable places to lie down after the baseball game had ended! That was life in Richmondale!

After my dad died, I began to realize that my mother was a very shrewd investor. We had very little income after he died, and his life insurance of \$5,000 did not provide support for very long. But she became interested in the stock market and invested what she could. The mortgage on our home (which then housed Tom, myself, and Mom) had been paid off long before my dad died, but she began to work as a seamstress in a parachute factory in Simpson. With that minimal income and the interest earned on her investments, we managed. When I was in high school and Tom was in college at Lehigh, she did work as a chamber maid in resort hotels in Monticello, NY. I learned to cook (more or less) while she was away. My mother's personal strength and wisdom were so clear to me. She was able to make ends meet and ensure that her kids had an opportunity to go to college or nursing school in order to move forward. I remember with affection that she very much liked to dance. My dad did not. But after he died and while I was growing up at home, she and I would dance around the kitchen... even though I had no idea how to dance! Carolyn, my wife and the grandmother of our crew, would affirm that I still don't!

My Education

I went to a one-room school in Richmondale for my first four years. The school had two floors. The elementary school (grades 1 through 6) was on the first floor and the high school on the second floor. There were typically three or four kids in each class and one teacher per room. This experience shaped my entire educational experience. I began to realize that one dedicated teacher could make all the difference in a young person's life. Mr. Nazak not only taught us to read and write, but he taught us to sing, and he pulled loose teeth!



At home after church in 1955 | Photo: Family Album

After grade 4, we were bused to the William Penn School in Simpson, PA, and then to high school in that town. Many of the small schools in the region formed consolidated schools by that time, and I graduated in a class of 39 kids (an order of magnitude more kids than in my grade school classes) from Fell Township High School in 1960. I played high school basketball in the Scranton/Wilkes-Barre area. We had a baseball team as well, but there were not enough big kids to field a football team! We were pretty good and periodically played in the Pennsylvania state finals in our division. We once played against a team from western Pennsylvania that included a kid, Don Hennon, who became an All-American player at the University of Pittsburgh! He was unstoppable! We did not win.

Educational opportunities were limited for kids in Richmondale. The nearest library was five miles away in Carbondale. Fell High had a dedicated group of teachers, but there were not that many of them, and they did not have enough breadth to offer a comprehensive pre-college program. But after Steve died, I decided that college was in my future. I also discovered that Penn State offered admission to all the kids who were academically first in their high school class. I was not sure how I would pay for it, but I was sure that I could be first in my graduating class. I also had a superb chemistry teacher in high school, Mr. Tarris. With his teaching and guidance, I managed to get a 750 in the Chemistry achievement SAT exam. I was first in my graduating class, though with 400s in the Math and English SATs, but was still admitted by Penn State. Every year that I was in State College, the university found scholarships for me. I majored in metallurgy, and so I had—in sequence—a Minerals Industries scholarship, an American Society for Metals Foundation scholarship, an Alcoa Foundation scholarship, and the Bayard D. Kunkle scholarship. I never met Mr. Kunkle, but I believe that he must have been someone who decided to give back to Penn State for similar early generosity on his behalf. That impressed me, and later on I endowed an undergraduate scholarship at PSU. Without Penn State, I might not have gone to college. Four people in my high school graduating class went to college. Three became public school teachers. I became a teacher at a university. Something in our experience at Fell High led all of us to lives in education. It was the dedication and commitment of our teachers! Access to dedicated teachers followed me to the Nittany Valley. Robert Lindsay and Harold Read were metallurgy professors who demanded the best from students at all times. They were excellent lecturers and made our understanding content a high priority. But an equally high priority was their insistence that we all be able to communicate our

understanding, in writing and speaking. So we wrote a lot and each document came back with even more red ink. But we all learned to write clearly and with meaning.

Speaking was more of a challenge for me! Not because of a speech impediment, but instead because of the local dialect. In Richmondale, the “h” in words was treated as silent. So as an early teenager, I used to meet my friends at a cluster of three trees to smoke cigarettes and drink beer. Yes, as an early teenager! The cluster was known as the “Three Trees.” But it was pronounced tree trees! When I arrived at Penn State as a freshman, I met with a faculty member to plan my first-year schedule. (My first year seemed like 10 years; I was lucky to have algebra in high school. Most of my PSU classmates had courses in calculus, biology, and physics that were at the college level while they were in high school!) After we had organized a class schedule, she looked at me and said, “You should see a speech pathologist!” I was crushed. But she thought that it would be useful, and she was right. I met for a half-hour each week during my first semester on campus with a speech therapist from the linguistics department. She would record as we talked for the first 15 minutes and then play it back. I had never heard my voice or my language in that way and I was astonished. This was probably among the most important investments of time in my life. I don’t remember her name, but I am grateful to her for taking this time with me. When I returned to Richmondale for Christmas at the end of that first semester, my friends listened to me as if I had come from another planet. But as I wound my way through the public speaking that was part of the Lindsay-Reed approach to education, I was grateful. And I am even more grateful today!



About Ron Latanision

Ron Latanision is Professor Emeritus of Materials Science and Engineering. In 2002, after 28 years at MIT, he joined the science and technology consulting firm, Exponent, as a Corporate Vice President and subsequently as the firm’s first Senior Fellow. He is the Editor in Chief of the National Academy of Engineering Quarterly, The Bridge, and of the De Gruyter journal Corrosion Reviews. He has always loved to write. In his words, “The Writing Group is a real find for me: the feedback from classmates and counsel from the leadership team now makes writing almost addictive!”

Back to the Store

Thom Opar

Time is the agent of change. We transform in ways that our end state is surprisingly different from the start. In this story, I share my evolving relationship—along with a few of the bumps along the way—with a routine, everyday activity.

Two weeks to the day after my second COVID-19 vaccination shot, I celebrated the easing of social distancing limitations in a novel way—I went grocery shopping. After 13 months of having groceries delivered to my door, I eagerly anticipated my first journey to a grocery store. Once inside the store, my extensive, pantry-restocking list slowly grew shorter and my cart heavier as I methodically traversed the store from the butcher shop, through the seafood section, and back to the dairy freezers. Passing rows of familiar cans, boxes, and packages led me to reflect on my lifelong relationship with this once odious chore as it evolved from one of dread to a pleasing, satisfying experience.

When I was a scrawny, timid eight-year-old, I preferred to sit on the porch exploring the planets and stars in a book rather than playing baseball out in Brotherhood Park. It was then that Mom realized that I was old enough to safely and expeditiously walk across the street to John Kowalchick’s sawdust-covered butcher shop to run errands for her. With a simple, straightforward request, “Pick up two kielbasa,” my grocery shopping sagas began.

Initially, help was not too far away. If I seemed confused in Mr. Kowalchick’s store, Aunt Eva, who was his bookkeeper, would pop out of the backroom to help sort out my difficulties. As soon as I mastered one-item butcher shopping, I was transformed into Mom’s 1950s version of an InstaCart shopper. Mom would hand me a short, scribbled (or occasionally verbal) list and some money, then dispatch me to the neighborhood grocery store, expecting a bagful of groceries in return. It was easy for her. It was never easy for me. Something always went wrong.

One afternoon, Mom realized she didn’t have all the ingredients for the dinner she was planning. I was in my usual spot on the back porch, engrossed in a book. I was pulled back to earth by an urgent request. “Tom. I’m making holupci (stuffed cabbage) for dinner. Go to the A&P and get me two 32oz cans of DelMonte tomatoes. Here’s \$2.00.”

The grocery store was nearby. Head three blocks east on 25th Street, pass Sam’s vegetable stand and Gus’s hotdog shop, take a turn north onto 2nd Avenue, passing between the sod-covered remnants of Erie Canal Lock #1 and the hulking junk yard, where my brother and I would drag our wagon to sell the junkman old newspapers for a

few cents per pound. The A&P was on the left, adjacent to the tall, rusty junkyard fence. If Mom's list was short, I could walk to the store, hunt through the shelves, pay for the goods, and return home in 20 minutes, but few of these trips went smoothly.

This particular one item errand should have been drama-free. I quickly found the aisle with the canned vegetables. It was easy to spot the red and green DelMonte tomato cans. My 'maybe-this-will-go-smoothly' hope was shattered when I realized that I didn't pay close enough attention to Mom's words. As usual, I had been deeply focused on my book. Calamity struck when I saw tomato paste, tomato sauce and stacks of tomato cans in various degrees of distress; whole, crushed, diced, and pureed. *'Why didn't I pay more attention?'* I knew Mom wanted tomatoes, but with all these options staring me in the face, and no Aunt Eva, I knew that I was in trouble.

Alone, I had to plumb through Mom's simple request to help me decide what to buy. I remembered '32oz.' There were no 32oz cans. At least it narrowed the options by one. The tiny tomato paste cans were far too small. Five options remained. She gave me \$2.00, but that was no help either. I could do arithmetic. No two cans summed to \$2.00. Four cans, not two, of crushed tomatoes were on sale, but not for \$2.00. I knew if I didn't get exactly what she wanted, then I would immediately be sent back to the store. I also realized that if I had to return an errant purchase, then I would have to talk with people I didn't know. In order to avoid this abhorrent encounter, I trudged home, empty-handed, knowingly trading more time away from my book and at least one more trip back to the A&P against trying to return the wrong can of tomatoes.

As soon as I entered the kitchen, empty-handed, Mom's brow furrowed. "Where are the tomatoes? Did you have enough money?" I hesitated "I didn't know what kind of tomatoes you wanted. There were six different kinds in the store."

She repeated our short conversation from a half hour earlier. "I told you I was making holupci. Didn't you see that I had the vegetable grinder out? I always puree whole tomatoes for holupci."

Once she said it, I did remember that I liked transforming her home-canned quarts of tomatoes into a red, seedy slurry with our aluminum grinder, but I only remember using it when she made spaghetti sauce, not for holupci. I wanted to say, "I don't know how to cook," but I knew it would only prolong an already painful task.

I was halfway back to the store when I remembered that I forgot to tell Mom that they didn't have any 32oz cans. Not wanting to waste more time staring at cans of tomatoes, I turned around, and skulked home, empty-handed, fully aware I would soon be heading back to the store once more. It would be many years before a trip to the grocery store would not be a painful ordeal.

Jump ahead fifteen years to 1975. My grocery store dread had been transformed, but not eliminated. Now, newly married, my weekly trip through Boulder, Colorado's King Soopers was a welcome respite from the persistent grind of being a second-year grad student. For me, it was 'date night.' Cathy never accepted the idea that a trip to a grocery store could be a legitimate substitute for a date. I frequently reminded her that our first date, during her freshman year, was an afternoon walk to Wegmans on Mt. Hope Blvd in Rochester, New York. She invited me to join her to buy the ingredients for a lasagna she was making for a Sunday evening Newman Community Dinner. In Boulder, just like Rochester, we were together. We held hands. We shared food-centric stories about our likes and dislikes, what and how we cooked, and family traditions. I told her of the places where I reconstituted dehydrated foods over a small camp stove on backpacking trips. She pined about the lack of cod cheeks in the woeful seafood section. She informed me that if we ever made it back to Boston, an excursion to Moulton's seafood in Medford would be one of our first destinations. I knew that one of the shared responsibilities of a married couple was to grocery shop. I would savor our Friday nights as long as possible, but eventually the day would come when I would have to shop alone. I silently hoped that the months spent shopping with Cathy eliminated the potential for drama that I experienced in my youth.

The consequential day began with a brief phone message: "I have a late meeting. I'll miss the bus at 5:15 p.m. I'll take the next one and be home by seven. I want to make cream of broccoli soup. I need some groceries. I left a list on the kitchen table. The list is short, but try to be creative."

Cathy never went to the grocery store without a list, but it was mostly a guide. While walking the aisles, some item would catch her attention, give her an idea for a meal, and subsequently make it into our cart. If we only purchased the items that were on her list, then all I would need to get them home was a small knapsack. But her 'creativity' transformed each trip into a 'loaves and fishes' event. The seams of a single knapsack would burst. It required Tetris-like packing skills to cram all the brown paper bags and loose, bulky items into the limited nooks and crannies of our Land Rover. I learned after our first Friday night date that I had to remove our camping gear and the interior spare tire if I was going to accommodate all her creativity.

After the phone call, I was eager to embark on the quest. I wanted to prove, to Cathy and to myself, that I could share the marital load. I left my office, walked back to our married-student-housing apartment and found the list on the kitchen table. Thankfully, it was small. I grabbed an empty daypack, affixed the panniers to my bike and pedaled off for a half-mile ride along 30th Street.

All those previous date nights paid off. A wave of satisfaction and accomplishment rolled over me. I quickly crossed all but one item off the list and even demonstrated creativity.

Cathy wrote Celestial Seasonings peppermint tea on the list. As I was looking for her herbal tea, I remembered that I used my last licorice-flavored teabag. I searched for Bengal Tiger tea among the colorful boxes, but to no avail. I saw no alternative. With no anise tea to be found, I thought of another way to satisfy my cravings. I bought a bag of black licorice. I was creative. Cathy would be proud.

After I added the bag of black treats to the cart, I returned to the last uncrossed list item. It remained uncrossed because I had difficulty deciphering Cathy's handwriting. I saw a four-letter word. The word began with an indistinct capital letter. My best guess was that it was either a 'C,' 'E,' or 'G.' It clearly ended in an 's.' As I was trying to decipher the scratching on the list and match it to obscure labels, I began to fret as A&P memories bubbled up. The middle two characters were not letters, they were numbers—the number ninety-nine. Still years before the smartphone and no one in the backroom to come to my aid, I had to rely on my wits.

After continued inspection, I decided that the first letter was 'E.' Cathy needs E-ninety-nines. I was bewildered. I had never heard of E-ninety-nines. I commenced a methodical, up-and-down the aisle search for the elusive product. I looked through the cleaning products. No luck. I thought, 'maybe it is a vitamin E-like variant.' Nope. I couldn't find anything remotely similar in the soft drink section. I was out of options. I gave up. The store was close to home. If it were critical for dinner, then in A&P-like fashion, I would go back to the store. As soon as Cathy walked in the door, mindful of my shopping anxiety, she asked "How did the shopping go? Did you get everything I needed?"

My pride swelled, "Everything except one item. By the way I was creative."

I sensed her curiosity. "Creative, huh. What did you buy?"

"I bought a bag of black licorice."

She followed, "What made you think to buy that?"

My logic was irrefutable: "I couldn't find any licorice tea. So to fill the void, I bought the real thing."

"Thom, you're a special person. I love you. I will admit, that was creative, but I don't know anyone but you who likes that disgusting stuff."

After this tender moment, she returned to the matter of the missing item, as she asked "What couldn't you find?"

"I couldn't find the E-ninety-nines."

"What are you talking about?"

I point to the single uncrossed list item. "I couldn't find these, the E-ninety-nines."

I struck a nerve in the person whose grammar school mastery of the Palmer method resulted in straight As. "Are you serious? Are you saying you can't read my writing?"

Trying to keep the discussion focused, I replied "I can read your writing. I just don't know what E-ninety-nines are."

Exasperation overtook her face, and she declared "I can't believe that you, who write with an indecipherable scrawl that no one else besides me can read, cannot read my writing!"

The mystery ended, "**That says eggs!**"

She proceeded to inform me that egg yolks were necessary for the soup. I hopped on my bike for one more trip back to King Soopers with E99s ≡ eggs forever etched in my mind.

Forty years pass after our newlywed forays into King Soopers, and our date night joy has resurfaced. As Cathy's cancer lingered, the treatments took their toll, sapping her energy but not her longing to stroll through the grocery store. Grabbing hold of a cart, a disguised walker in her words, we shop together once more. We hold hands. We recall the food traditions that we created over the years. Every moment that we spend trudging up and down the aisles in search of that 'special' item is a celebration.

With my COVID isolation ended, my first act of regained freedom is a trip to Wegmans. List in hand, I enter the store after a 13-month absence. I add cans of crushed tomatoes to the cart, alongside wild-caught cod and a dozen E99s. I display the creativity that was a mystery for many years as I place, in spite on not being my list, three bright red tomatoes, some sprigs of fresh green basil, and a soft, white roll of mozzarella into my cart. Maybe it was time, maybe it was necessity, maybe years with a passionate partner, but what was once panic-inducing is now welcome. My grocery store angst is gone, replaced by delight whenever I go back to the store.



About Thom Opar

Growing up in an ethnic enclave in Upstate New York in the 50s and 60s, coming of age academically, socially, emotionally in the 70s, living through 40 years of couplehood followed by seven years of widowerhood along with parenthood and a long career at MIT Lincoln Laboratory has provided me fodder for stories. The Nita Regnier Memoir Writing Group has provided me a platform to explore and practice the craft of creative non-fiction, allowing me to transform this raw material into the written form.

Part 2:

Onward to Yalta

(Or, Slipping Through the Iron Curtain with Bad Maps, and Backpacks, continued)

Lucy Wilhelm

Note: this follows Part 1 from our previous publication, in which is described the first leg of a month- long camping trip my husband Rob and I took into the old USSR in the summer of 1972. We'd been married a year and this was our belated honeymoon—with backpacks, tent, a tiny cookstove, visas, reserved Russian rental car, and a smattering of Russian phrases, all tempered with a balance of Yankee enthusiasm and pitiful naïveté. Here the story continues after we'd taken the night train from Helsinki, landed in (then) Leningrad, picked up our rental car and after exploring the city set out on the long road to the Crimea.

The whole of northern Europe was experiencing a drought and heat wave that summer. In western Russia, the heat was so great that the peat bogs to the north had caught fire and caused a dense layer of smoke to float over much of the city and surrounding countryside for the entire month we were there. There was little breeze and the haze was thick at times. My memory of that stay is always flavored with the pungent vapors of smoldering peat and a haze overlaying the cities and the campsites like a misty blanket.

We'd drive to the towns or cities in the morning from our campsites, take a few crudely made sandwiches of cheese on the tough and hard local bread, a water jug, and spend the day sightseeing or taking a guided tour. The guides in the cities were all schooled in the "memorize the height in meters and number of bricks in each edifice and stun them with these impressive facts" mode of presentation and were usually women. At some point we were no longer able to feign interest and instead took photo after photo. Heroic figures of muscled workers, all in heavy concrete relief, stood out on the sides of buildings, identifying them as from the Stalinist era: Socialist Realism, or art as propaganda for the state.



Stalinist era propaganda in the streets. | Photo: Lucy Wilhelm



The much admired Peter the Great, in Leningrad. | Photo: Rob Wilhelm

At day's end we returned to the campsites exhausted, to visit with other campers in the community cook shed, heat our soup from our supply of dry packets on the little camp stove, and perhaps sip vodka offered by fellow travelers. We valued these meetings most, connecting us with genuine folks who were equally curious about us and our American life. A young couple from Murmansk who spoke only German as their other language, were kind and warm to us; I could manage a few phrases of my schoolgirl German to piece together conversations. And it turned out that I became more fluent as the vodka intake increased. Grammar rules no longer seemed necessary (gender, case, declensions? Forgotten!); Rob could only nod, and listen and chuckle. Their curiosity about American life brought the question of how many cars we owned—a car being a much-coveted but mostly unobtainable commodity—for many Russians; when we said 'two,' it was clear we were deemed to be quite wealthy. We never mentioned that our cars were two VW beetles, one a rusty and dented 1955, the other a 1970—or that we lived in a tiny three-room basement apartment with a bathroom shower stall the size of a

phone booth. When queried about our family I said that we had two cats, no children. The couple had two young children; I wanted to give them something memorable as a souvenir (they'd supplied the vodka, after all) but all I could manage was two US Lincoln pennies from my pocket change. I handed them the coins, "für die kinder" I said, and we parted with fond farewells.



The iconic St. Basil's Cathedral in Red Square, Moscow. | Photo: Lucy Wilhelm



My attempted sketch of the cathedral, drawn on-site. | Artist: Lucy Wilhelm

On to the South

You would not think we'd be so ill prepared that we would run out of toiletries but I discovered my empty toothpaste tube while in the Moscow campsite. The next day in the city's center, I ventured into the lobby of the Hotel Moscow, a dreary cavernous space with no color and little human activity. But a low glass-topped display case sat at one end with a sullen-faced clerk standing over the meager selection of supplies for guests. [As I mentioned in Part 1, before our trip, we had used homemade alphabet flash cards: I'd learned enough of the phonetics to pronounce the written script.] I spotted a white screw-topped tube with blue script on the side spelling out "Florena" in Cyrillic—bingo! It had to be toothpaste. I pointed to it, laid out my few kopeks, and pocketed the tube.



The Pocket Guide that got us from North to South. | Photo: Lucy Wilhelm

That evening back at the cabin, I stood on the tiny porch brushing my teeth with a tin cup of water, finally dumping the rinse over the rail onto a bed of dry pine needles. My first taste of the toothpaste caused me to gag and spit. Lifebuoy Soap! That was the flavor that came to mind. Carbolic flavored, those dull red no-nonsense post-war all-purpose cakes of practical soap we all had at our bathroom sinks in the 40s and 50s. What had gone wrong? "These poor Russians," I thought, "even their toothpaste tastes awful." On the next day back in the city, I scooted back to that hotel lobby and up to the toiletries counter on a minor suspicion. I looked imploringly at the clerk, pointed to the tube, made a tooth-brushing motion and gestured a question. She frowned, shook her head vigorously, and made circular brushing motions on her cheeks. Oops. Shaving cream. I would not rely on my own interpretation of Cyrillic script ever again on that trip. Upper case only, and nothing but road signs would I attempt!

We pressed onward in the dry heat and haze, finding our way on the sketchy map from Moscow southward through Novgorod, Orël, Levshino, through to Kharkov and Zaporozhe.* I'd always heard of the Ukraine as 'the breadbasket,' but that summer, any wheat would have fried on the stalks; it was that hot and dry.

Rob, arm resting on the open window at the car's wheel, had taken off his shirt when a Russian man on a busy city street yelled out, pointed at him, and angrily gestured, plucking at his shirt. Apparently, driving bare-chested was a breach of decorum! This reminder was many years before a particular Russian head of state posed on horseback, shirtless and smirking in macho bravado for the international press. Times and manners change.

The campsite in Orël consisted of a flat field of dry yellowed grass, circled by several crude wooden tent-shaped cabins, reminiscent of a US army boot camp training ground. No frills! A couple of young German men were in the cabin next to us; they were driving a black VW beetle which they had painted on the side "Aladdin" (they pronounced it Al-lah-DEEN,) and now that the car had been to Leningrad and seen Peter the Great on his horse, it was re-named "Al-lah-deen ze Great." Their English was good enough to share tales, and later a bottle of cheap Russian champagne.

In the morning an affable young Russian man who spoke excellent English came up and introduced himself as Vladimir. He told us he was a Boston Bruins fan and invited us for the day to his family's 'summer house' which turned out to be a tiny one room cabin on a postcard-sized plot of land, surrounded by other tiny cabins in a larger patchwork of small vegetable gardens by a river. Inside at a crude but clean wooden table, Vladimir entertained us by feeding us a lunch of dark Russian bread, which we ate with huge raw garlic cloves dipped in coarse salt—a totally new taste experience—and washed down with icy vodka. Surely the Russians had other things to eat; the entire miniature yard of the summer house was a garden of vegetables. A large brown hare crouched in a corner, munching on cabbage leaves; Vladimir said it was a regular visitor.

We changed into swimsuits, and Vladimir then walked us to the nearby river bank where people were jumping off a small gangplank and swimming. The water was refreshingly cool, swiftly running, and the color of coffee with cream. Who knew what was beneath the opaque surface; I held my breath and jumped in, hoping not to tangle my feet in a thatch of branches, sticky mud, or worse. In hindsight, we realized Vladimir must have been 'assigned' to us, by some higher government authority (KGB?). He later returned us, tired and woozy with vodka, to our little campsite cabin. If his job was to keep us from exploring any unauthorized sites, he'd done well.

A word about buying food must be mentioned because the Russian system was not at all clear and involved some trial and error. Stores available to us, usually modest-sized no-frills shops, had cans or packages of various products lining shelves. We entered the shop, asked for an item by name (or in our case, pointed), then the clerk fetched it to a counter, totted up prices on an abacus, and handed it to us as we presented our Russian currency. If we didn't know what to call the food, or couldn't identify it, or worse had no clue what was available, we found very little to eat in these shops. There were street vendors in the larger towns where we were able to get fresh, but very tough and hard, bread and here and there a roadside fruit stand. Local beer (kvas) was sold from small tanks on the street and we did find the ice cream vendors we'd been hoping for. Once we saw a long line of people waiting outside a shop in the hot sun for some mystery item; we just got on the line too and when I asked a woman what the line was for, she replied "arboozh." That turned out to be watermelon. It was worth the wait.



The watermelon purchase adventure. | Photo: Lucy Wilhelm

Hitchhikers were seen frequently on the roadside, carrying cloth bundles or baskets of produce to market, or simply going to the next town, and we noted that people were generous about giving them lifts. We saw our chance before long; a wizened babushka stood roadside carrying her market bundles and was initially hesitant to board when she realized we were foreigners. But curiosity must have overcome her, as she got in and took a seat in the back. A small girl, probably a grandchild, accompanied her. In a string bag on the seat beside her with a little pile of vegetables trembled a small live rabbit. Stew for dinner? Somehow a full conversation was carried out in sign language and we managed to convey that we were newlyweds with no children yet. The woman seemed delighted to be in our company; before exiting the car at her destination she reached forward, put a hand on each of our heads, banged our temples together lightly and wished us long life and two children, a boy and a girl. I don't know how we got this message but it was clear. Like an old gypsy curse, except that it was benevolent. Maybe the old gal was on to something; nine years after that summer our son Alan was born, followed by daughter Annie Laurie a year later. Well, she'd never said how long it would take.

The drive through the Crimea seemed endless, hot, and dry, with little scenery and few trees but at last it came into view: The Black Sea! As for 'campground,' there was no such thing; our lodging turned out to be a room in an aging, crumbling, and very ornately designed hotel on a bluff overlooking the beach. The hotel was well past its prime but for us it evoked the romance of other times, and was far less crude than wooden sheds or our tent in the campgrounds. There was even a breakfast included in the hotel dining room in the early morning. A French couple shared our table and appeared aghast when I discreetly pushed aside the caviar set at my place. They were happy to accept when I offered them the aromatic fishy globs. If you've been raised on canned StarKist tuna for your school lunches, it can take some years to appreciate this delicacy, if ever. I'm still not a caviar fan.

The stony beach was clearly a playground destination for all manner of visitors who came to bathe in the Black Sea. Nowhere was there the fine granular sand we knew from our Atlantic coast beaches, but large black sea-polished stones that rattled when the waves came in! Sunbathers lay on wooden pallet boards supplied by the hotel. The happy Russian women in their height-of-fashion cutout suits which displayed fleshy bulges in a way that you'd never see, ever,



Russian camping started in tents.
Photo: Rob Wilhelm



Then, we graduated to staying in cabins.
Photo: Lucy Wilhelm



The CLLA mobile in all its glory. | Photo: Lucy Wilhelm



A magnificent grandhotel in Yalta.
Photo: Lucy Wilhelm

on the French Riviera, were visibly enjoying the seaside holiday with no self-consciousness. Here it was fitting and the joy of folks being at the ocean was clear. Far on the horizon were tankers crossing to various ports, but right here the enjoyment of Russians on holiday was palpable and contagious.



Locals have flocked to the pebbly beach at Yalta to swim in the Black Sea.
Photo: Lucy Wilhelm

Evenings would bring out travelers from other autonomous regions, wearing distinct native dress, strolling the boardwalk as on holiday. Young women strolled in couples and threesomes with locked arms, laughing; young men lounged casually against the railings, smoking unfiltered cigarettes and taking sidewise glances at the girls. One got a true feeling of a mix of cultures and languages, and here in this vacation setting, the grim grip of the Soviet overseers seemed temporarily forgotten.

Our shadow in Yalta was to be "Serge," a rough edged American (so he said) young man wearing a loud Hawaiian shirt and shorts, who seemed to latch onto us. He constantly asked us where we would go that day, our impressions of things, and other questions meant to elicit opinions. Perhaps we were too naïve to be suspicious of him right away, but looking back my impressions were: he was trying too hard

to look/be American; his accent, whatever it was, had a hint of 'other' even though he'd said he was from upstate NY. I could hear 'Buffalo NY' but with undercurrents of Russian. If we went to a winery, Serge would appear coincidentally attending the same tasting. We'd climb down the bluff on the long series of marbled steps to the seashore; there was Serge waiting for a friendly chat. Serge are you listening? I hope the KGB has retired you with a nice pension. Maybe you've gone 'back' to Buffalo.

At first, Rob did most of the driving, and then all of it after my incident with the bus while at the wheel. Somehow my slowing down at a roundabout caused the big passenger bus behind us to bump the rear of the car, leaving a visible dent in the trunk lid. The driver stopped and got out, we stopped and got out, we quickly determined that we did not have a common language and were at a loss to know how to deal with damage. I threw up my hands, the driver threw up his hands, no doubt mightily relieved not to be held responsible for these dumb tourists and their dented rental car, and we both got underway again. Somewhere along that route, Rob asked me to pull behind some shrubs at a turnout, and he said, "I'll only be a minute." He slid under the front of the car, presumably making some mysterious adjustment. Caution was necessary as the Intourist rental would know the approximate mileage we'd need to cover to get to Yalta and back. We were aware of our diminishing cash supply and feared running out of money to pay any possible fines.

Driving north on the return route, we ended up at the Intourist hotel to settle up. At the hour of return, the car rental inspector immediately spotted the dent, made a note and dinged us a fee for the damage. Rob and I exchanged silent glances. Had there been a stealth adjustment to the odometer, setting it back some miles and saving us some rubles? So long, Russia, bye-bye Volga!

We found a bus to the train station, caught the night train, and once again were assigned to separate bunks. We were genuinely surprised at having our Finnish knives, confiscated by customs on entry to Russia, returned at the border checkpoint after presenting our paperwork. It was with great relief that we found ourselves back in the safety of Finland on a brilliant sunny August morning and fairly wept at seeing real food: a buffet near the train station presented fresh fruit, cheeses, bread, soups, even breakfast cereal. We could have eaten it all.



The knife we thought we would never see again! | Photo: Lucy Wilhelm

Epilogue

The rest of the trip was only mildly dramatic, owing to us having run out of money at the same time that our charter flight back to the US had gone bust. These cancellations happened with several other charter companies that summer, leaving many American tourists stranded. A train ride to southern Sweden connected us with friends on their farm just at harvest time and we helped them with the hay harvest. I got to drive a Swedish tractor while the men tossed hay bales onto the flatbed behind. We all earned our keep. The daughter was an old friend who'd been an au pair in Cambridge in the 1960s, and spoke perfect American English. Her family was hospitable to us. We did not let on that we had nearly run out of money, we just accepted their hospitality for the few days of harvest. During the evenings, we watched much of the Summer Olympics which took place in Munich that year, on TV.

Before leaving Sweden, Rob insisted we visit Millesgarten, a world-famous sculpture garden featuring large sculptured figures by the artist Karl Milles. Within the grounds were reflection pools and fountains, into which tourists had tossed coins—we noted these and we both had the same idea. Rob discreetly held onto my jeans by the waistband as I leaned carefully over the shallow walls, stretching and scooping up as many of the shiny Kronor as I could; it was never quite enough to buy a meal. Finally, we contacted a friend in the US to wire us money for a return airline ticket.

Home at last in Cambridge I was glad to reunite with our cats, who'd been left in the care of friends. At the end of that summer, I'd also decided to take a leave from my job as a high school art teacher in Boston and launch into a new career as a batik artist, having been inspired by seeing wonderful batik art created by accomplished Scandinavian artists in the local galleries. So the trip was a career turning point of sorts for me. Rob went back to his job directing incoming railroad cars at the First National Foods grocery warehouse in Somerville. It would take nearly a year to sort all our slides as we relived memories of that summer.



* Editor's Note

A keen reader will note several choices in place names and spellings that reflect Soviet-era naming conventions in place in 1972. The author and editor both feel that retaining these names as remembered help transport the reader to the political (and recreational) environment of the time; after all, we're fairly certain Lucy slipped through the Iron Curtain under the constant surveillance of Soviet minders, and the politics of the time is inseparable from the experience.

This piece, written after the annexation of Crimea and before the horrific escalation of Russia's war in Ukraine, therefore uses the transliterated Cyrillic that you would have seen flipping through Lucy's pocket guide, "From Moscow to Yalta" instead of Ukrainian spellings that most of us now recognize from the news, like Kharkiv and Zaporizhzhia. We can't express enough our love and support for the babushkas of Ukraine, filled with the same kindness they showed Lucy and Rob in '72, and the young people fighting for their lives and to retain their independence.

About Lucy Wilhelm

Originally from NY, Lucy attended NYC public schools and later earned a BFA in illustration from Syracuse U. She arrived in Boston in the fall of 1968, after returning from Peace Corps service in Africa. She has worked as a public school art teacher, solo owner of a gallery and studio in Cambridge, a software graphics illustrator for industry, and finally as an admin in the Division of Comparative Medicine at MIT for 20 years.

Her dream as a young girl was to be an artist and to have travel adventures, and she feels fortunate to have experienced both. She has lived in Cambridge for 50 years and raised her son and daughter here; her late husband Robert Wilhelm attended MIT in the 1960s and she never imagined she'd end up working there so many years later.

Her earliest adventures in writing began with letters to pen pals, friends and family and later expanded to illustrated journals and essays. While anticipating retirement and exploring offerings for MIT retirees, she found the memoir writing group and it opened a wonderful new door of opportunity for connecting with others and sharing life stories. She was welcomed into the group in 2015.

Lucy is grateful to MIT for her 20 years of employment and the richness of experience it has brought her. She retired in 2018 and is working hard at avoiding housecleaning in order to focus on drawing, painting, and writing with the memoir group.

Crossing the Sahara

Nancy DuVergne Smith

When I graduated from college, my yearning to travel became an action plan. I had been waiting for the freedom to see the world since elementary school. I grew up in the civil rights era in Mississippi and read Uncle Tom's Cabin and several Balzac novels as a child, books that opened my eyes to injustice and other cultures. Starting at age 11, my life goal was to leave Mississippi, which seems timid in retrospect but I knew few people who had done it. A painting major, I was not on a corporate track, and my new mission was to explore the world.

My first step was to move to Puerto Rico where a fellow Tulane graduate helped me settle in. For eight months, I worked first as an executive secretary at a Holiday Inn and then, to make some real money for my travels, I became a bartender. In that new life, people stayed up all night going to night clubs and casinos, and I met many flavors of global travelers, sun seekers, and seedy opportunists in San Juan. My tips added up nicely and, by spring when the tourist trade died down, I was ready to move on. After a visit with my parents in Mississippi, I took myself to Europe, making youth hostels and American Express offices my home bases for the foreseeable future.

I began traveling alone because I couldn't bear to wait any longer to get out in the world. Friends lacked either the time, money, or wanderlust. In Europe I found lots of 20-somethings circulating, sharing rides in vans or hitchhiking, so it was easy to connect with people to hang out and sometimes travel together. I still have some of those travel buddies as friends. It was easy to meet people of all ages—no one is afraid of young women. On the flip side, I needed to stay alert to danger and dodged a few dicey situations. Mostly, though, I felt energized and free.

Each day a miracle occurred: I got to decide whether to stay where I was or roam elsewhere through the UK, the Netherlands, Germany, Greece, Italy, Switzerland, and in and out of France countless times. Go to a famous art museum or stroll the urban center? My choice. For money, I picked apples in the Netherlands and Switzerland and worked as a waitress on an US Army base in Germany. Then, on an American Express bulletin board in Paris, I found a ride to Spain, traveling with a dozen people who were driving old European cars to Africa to sell. Within a few days, I joined them and decided to go to Africa too. Why not? Our main adventure was going to be getting the cars and ourselves across the Sahara Desert. That seemed like a real adventure,

yet not too crazy since it would be a group trip—and therefore cheap and reasonably safe.

Our caravan drove south out of France and along the glittering Mediterranean beaches of Spain, cruised past Gibraltar by ferry, then docked in Ceuta, a tiny Spanish port on the tip of Africa. We spent a month in beautiful Morocco, visiting Fes, Marrakesh, Casablanca, and a magical oasis near the Atlas Mountains called Source Blu. To cross the desert, we had to bring everything we needed to keep us and eight old cars functioning. We not only had to take food and water but also motor oil, gasoline, tools, and spare parts strapped to the top of the cars. My personal supplies prioritized toilet paper and pills to sterilize the murky water we would soon encounter. In the heart of the desert, I was struck with intestinal woes—oh, that murky water—and gratefully accepted antibiotics from a European traveler who really knew how to pack. Sand ladders were needed daily to get one car or another moving because, in the 1970s, there were no roads through the desert. There were three pistes or paths that provided guides across the world's largest hot desert, an area about the size of the US. The Tamanrasset piste, which we took, carved south through Algeria to Niger. We were in the desert a month and stopped twice to replenish supplies. The piste itself was defined by a pile of rocks, maybe three feet high, placed about every 100 feet. If we lost our way, we could die. So we edged forward carefully, stopping often to dig out a car or clean sand out of a carburetor and get our bearings from the next rock pile. Some days seem to last forever, and sandstorms, though rare, were a blinding terror.

Our roving tribe splintered into factions—English speakers and French speakers. A French man, who owned the cars, and his American girlfriend were leading the expedition and taming the various disputes among us. I shared a car with two bickering French people who were otherwise pleasant companions. At night, we laid our sleeping bags either in the sand or in the car, depending on the cold and the wind. On the outdoor nights, the stars blazed overhead, brilliant and silent. There was little, if any, privacy, and nerves frayed a bit, especially when it seemed we might run out of water or gasoline before the next town.

Scarcity did not make any of us better people. Arguments broke out about who was cooking or cleaning up that night or who had to sleep

sitting up in a car seat vs lying down in the back. This month laid bare my eager acceptance of privilege—I never turned down the chance to sleep comfortably. And passing through impoverished regions, I saw that my own modest means afforded me the luxury of travel and the expectation of survival. Although our group was sometimes contentious, I was grateful for them when I had to face down the police chief of Tamanrasset. He had questioned us in a local café and seized my passport. To get it back, I was required to go to the police station. The chief took me into his private office and suggested that I could get my passport if I extended certain courtesies to him. He said he had heard that I had been dancing naked on table tops. Not true—but I wanted help to get out of that situation. Fortunately, my crew was in the waiting room, so I suggested that we bring them in to attest that this rumor was false. That prompted him to let me go, and we left the town quickly. Although no person was left behind, one vehicle didn't make it. We abandoned a car that finally refused to budge, but our group did not leave it for the wandering Tuareg tribespeople to salvage. Several of the men in our group grabbed tools and smashed it to bits leaving broken glass, crushed metal, and ripped seats. I did not understand that primitive ritual. Maybe stress and scarcity doomed that old heap, but at least it was not a human being taking the beating.



Car smashed on the Tamanrasset piste. | Photo: pixabay



Topology of Thirst | Watercolor Artist: Nancy DuVergne Smith

A month in the Sahara is a long time. The landscape is mostly barren, rocky plateaus, dry valleys, and crusty peaks, and, only occasionally, picturesque sand dunes. I saw no clouds nor signs of vegetation nor animal life. The occasional sandstorms destroyed the visual reckoning that we relied on for our lives. A few times, we spotted a compound of mud huts and were invited in for tea and dates, although no women were ever visible during these weeks in the desert. Another day, a band of handsome Tuareg men flew by us on camels, like a scene out of Lawrence of Arabia. In a freak episode, we waited for two days on a rise overlooking the piste for authorities to sort out a tragedy—a collision between a truck and a land rover had cost several lives. The waiting was a sad desert courtesy for the dead. Since there were never more than two or three cars crossing our path in a given day, this sandstorm-driven accident was eerie.

About day 30 in the desert, we reached a crossroads in Niger and our group split up. The French headed southeast to Cameroon to sell the cars and the Americans headed southwest to Ghana. A traveling

buddy and I secured rides on local transport that ranged from an open-air tractor trailer truck where we all sucked water out of an old tire inner tube, to open-air buses with emaciated people, many with open wounds, jammed together. Their condition frightened me and I was happy to leave the Sahel behind. When we arrived in Ghana the world was transformed—women were running everything and flowers were bursting from the dense vegetation. People of all ages dressed in brightly colored clothing sharing their good spirits and bountiful food with us. For a glorious month, I hung out on the beaches and in the markets with the friendly Ghanaians and various expats before making my way home via the Canary Islands.

When I arrived back in the US after a year in Europe and Africa, I was agog at the miracle of the American bathroom, private and clean. After months of holes in the ground—at best—I was deeply grateful to be back in the land of flush toilets. I landed in New York and I stayed for a few days with the parents of a friend. During a dinner gathering there, I entertained the guests with tales of my trek, which sounded charming in retrospect. But adventures, like mine, are not pleasant vacations. They are, however, mesmerizing and can be transformational. Sitting under the stars, my comrades and I shared bits of our lives. We were similar in age and travel lust, but each story was a life in progress. I got an earful of opinions about American politics (ouch) and some understanding of why America, with its outsized influence, mattered to Europeans. Personally we were each wandering, looking for our adult lives. People were in love, had been in love, or searching for love. Although not alone, we were sometimes lonely. We did not yet belong anywhere. Around the fire, though, we had the night sky, the quiet desert, and our stories.

Looking back, I appreciate the freedom to roam, the confidence to try it, and the good fortune to survive it. Mostly, though, I learned what it takes to be a good traveler and companion—flexibility, empathy, and a bit of planning. And that knowledge has been useful.



About Nancy DuVergne Smith

Nancy DuVergne Smith is a watercolor artist and writer. She has worked for newspapers and magazines, retiring from MIT in 2018. On the arts side, she is co-president of the Newton Art Association and shows her paintings regionally.

Bitten by the Sailing Bug

A Transition in Slow Motion

David Kettner

The concept of sailing has intrigued me for a long time. The wind creates forces that seem almost magical, and the motion is silent except for splashing sounds as the bow cuts the water. But at first, sailing troubled me. There is the fear of losing control, tipping over, getting wet, or worst of all, losing the boat in the process. There is also the accompanying embarrassment at having to be rescued. I can't identify a single origin of my interest, except to observe that there have been many inspirations over time.

Perhaps the earliest inspiration was my father's interest in boating. He subscribed to *Motor Boating*, a magazine devoted to power boats, even though we lived in Utah in the desert at the time. At first, I didn't think it unusual, for I had learned he had a dream to own a small Chris Craft cabin cruiser and to tour the Inland Waterway along the East Coast when he retired. The magazine fed his dream. Years later, when I was a young adult and Dad was in his 70s, I asked what became of his idea. He told me that after he and Mom had left me at MIT for my freshman year in 1961, they traveled to Rhode Island to visit a boatyard and see a boat he thought he could afford. When Dad got to see it, he realized there would be much climbing in and out, and up and down the companionway, and he knew that Mom, who had a balky knee due to a childhood accident, would not be able to cope very well with the physical maneuvers required to participate with him. His boating bug died upon seeing the boat he thought he wanted, and he gave up the dream that day. His story stayed with me, especially as my wife and I grew older.

Another inspiration may have been the fact that MIT had a sailing pavilion and many dinghies. In the fall and spring the dinghies were out, slowly going around the basin between the Longfellow and Mass. Avenue bridges. A roommate took me sailing one day in a Tech dinghy on the Charles River. A dinghy does not have a keel, so it is more prone to tipping over than a keelboat. The keel is, in part, a counterbalance to the force of the wind on the sails. The Charles, in the 1960s, was not a clean river, and there was a joke about being able to cross it on foot. I tried to enjoy the outing, but found being in a dinghy on the Charles to be unnerving given the fear of tipping over and the dirty Charles River, and I wasn't too sure about my host's sailing ability, either. I went out only once. The boating bug never emerged on this occasion.

Skip ahead a decade and a half, and my wife Caroline, our son, and I are on Kwajalein Atoll in the Pacific. I had been assigned to work there. We lived on an Army base, where there were about 40 military personnel and 2,000 civilians. Despite the remote location, the job had lots of perks, including several 20-foot Cal 20 sailboats which were available for our use at no cost. This was a keelboat (much less likely to tip over because of the keel), and about eight feet longer than a Tech dinghy.

It was necessary to qualify to take one out. This included a written test, which covered the waters around the atoll where the boat could be taken, and a practical test. A co-worker taught me how to handle the boat. Caroline and I would go sailing from time to time, taking our son with us. Kwajalein was at about 7 degrees north latitude, and the trade winds blew steadily for nine months of the year, making for very reliable sailing. However, we rarely strayed far from the harbor. We weren't highly proficient nor did we want to become competitive sailors, but rather we went out for the enjoyment of being on the water for a few hours. We were experiencing some boating bug bites. After we had been sailing for about a year, the Kwajalein Yacht Club (of which we were not members) decided to hold a race from Kwajalein Island to Roi-Namur Island, a distance of about 80 miles. We watched the race begin as the small fleet headed north along the inside edge of the atoll chain of islands. It was clear there were some very determined sailors participating, driving the boats hard. By evening, we heard the sailors had encountered higher than expected winds, and more than one boat had been dismasted. A tugboat had been dispatched to rescue them all and tow them back to Kwajalein. Several boats sustained damage during the tow trip home in addition to the damage caused by the aggressive racing. By the time the boats had returned, they all required repair work; some of the damage was significant. On several, the top deck had separated from the hull along a joint that ran from bow to stern. I watched as these were reassembled, and while I didn't know anything about repairing fiberglass boats, the workmanship of the repairs looked questionable. I decided they weren't going to be reliably safe vessels, particularly for our family with a baby. We never again went out in one. My boating bug went back into hibernation.

After Caroline and I returned from Kwajalein (with two sons now) our life settled down. My career at work was going well. The thought of going sailing kept returning to me, but, on the other hand, we had two small boys, and we liked camping, too. We bought a big Buick station wagon with a view that we would be towing something—either a small boat or a camping trailer. In the end, we decided that camping would make more and different kinds of family adventures possible than sailing a small boat; we bought a pop-up trailer and got good use from it.

For many summers, Caroline's parents rented a cottage on Southport Island in Maine. The camping trailer went with us and provided a space for the boys to sleep away from the adults. Al, a good friend of my father-in-law, lived two cottages away, and we visited with him often. He owned a small sailboat—a Cape Dory Typhoon, about 19 feet long. This is a keelboat—not a dinghy. The keel runs from bow to stern. We spent many happy days over several years sailing with Al in his little boat in the Boothbay Harbor area.

Al was a competent sailor, and very safety conscious. Over time, he gained enough confidence in me that I took the helm, and he provided instruction on how to handle the boat in the continuously shifting winds and the rough seas created by power boaters. On rare occasions, I took the boat out myself. The boating bug was biting all the time, and the bug was getting bigger! Thoughts of owning a boat started to intrude seriously for the first time. The Maine coast is a very interesting and beautiful area to sail, and Al had many stories about trips he had taken, further increasing my interest.

When I turned 50 in 1993, I began thinking about Dad's dream. He had to wait to realize it, and the opportunity came too late. Would I regret not getting involved in a bigger way with sailing now, while Caroline and I were still relatively fit? Would I regret not owning a boat? How could I know? The time was ripe; it was now or never. I wanted to get started well before it was time to retire. Then I learned that MIT would pay for classes that I could take in preparation for retirement. A co-worker had gotten kite-boarding lessons on the Columbia River paid for, so why not sailing lessons?

I began with a community sailing organization on Lake Quinsigamond near Worcester. This was an easy drive west of Stow, where we lived. They had dinghies—no keel, again—and offered lessons at a very nominal cost. I learned to get around on the lake, a narrow, mile-long lake between two hills, despite the somewhat squirrely winds caused by the hills. On one occasion, I sailed in a circle without having to change the sail position because the winds were so weird. The second summer, I happened to go out on a very windy day. I sailed out from the dock, but because the winds were so strong, I was unable to tack (turn) into the wind in order to go the other direction. The wind pushed the boat backwards. I gave up and turned downwind, planning to perform a gybe maneuver.

In a tack, the wind comes over the bow as the boat turns. A gybe is a turn in which the wind comes over the stern of the boat as the turn progresses. As I went around in the gybe, the wind caught the sail and turned the boat over! It all happened in slow motion; I held on to the side of the dinghy and managed to crawl onto the bottom of the now overturned boat, where I waited to be noticed. Eventually, the dock crew sent out a motorboat to rescue me and the dinghy. It was embarrassing, and I drove home wet all over. After that, I didn't fear tipping the boat over again, for I had already done it. This "cure" for my fear was a result I hadn't expected.

By this time, I was also done with sailing dinghies. That particular bug was gone. I joined the Boston Sailing Center in Boston Harbor in about 1996. They had keel boats. They offered lessons, and required you have lessons to qualify to use their boats. The Sailing Center is located on Lewis Wharf in the North End of Boston. There was parking nearby, and it was always interesting to walk through the North End after a day on the water, as there were often Italian festivals underway with food, music, and crowds of people. This was another unexpected effect of sailing—the variety of experiences on land as well as the water. Lessons for beginners were conducted both in a classroom and on the Soling, a 30-foot keel boat used principally for racing. They are tied to moorings near the main office, and a motorized launch boat took us out to our boat for the on-the-water lesson. There were usually three or four students in the boat, along with an instructor. I was the old guy in the class. The typical student was in his or her early twenties and caught up with finding a significant other and/or a cheap apartment in Boston.

The Soling is quite simple in design. The cockpit is open, and there is essentially no storage available in it. It also has no motor, so an important practical lesson was how to sail up to the mooring and grab the mooring pennant (the line to attach to the bow of the boat). We took the boats out of the mouth of the harbor, beyond Logan Airport, and around the islands in the outer harbor. Since the boats were used in a regular racing season, they came equipped with a small spinnaker. We also learned to deploy the spinnaker, to maneuver with the spinnaker up, and to get it down again.

I passed the course and started taking Caroline out for day sails. She loved the idea of sailing, but was not so sure of my competence, nor of hers. She was always terribly nervous, so much so that I worried how pleasant an experience it was for her and whether this sailing business was a good idea after all. It took a long time to convince her to take lessons, too. After two years, she finally consented to do so near the end of a sailing season. Because it was early September, she was the only person in the class, a five-day experience. Her instructor won her over. The next time we sailed together, it was like going out with a different person! She was comfortable in the boat, knew what to expect, and we began learning together what to do. We were happy to use the mainsail and the jib.

We had lots of fun sailing the harbor and learned that, although sailboats usually have the right of way, commercial vessels have even more right of way. We had to be alert for ferries and tugboats, and maneuver soon enough to avoid them. An LNG carrier would on occasion come into the harbor, headed for Chelsea to unload. Passing the airport meant that aircraft about to land passed directly overhead, a scary sight as they approached. One afternoon, as we were preparing to leave the boat for the day, a three-masted sailing ship from Argentina came into the harbor with the sailors standing on all the cross arms in a salute to Boston. It was a wonderful display, and really made the sailing bug bite both of us.

The Sailing Center also had J/24 sailboats. These are somewhat smaller than the Soling; they are about 24 feet long. It is another boat designed primarily for racing, but it has a small cabin with two bunks in it and space for some camping gear. The J/24 was also outfitted with a small outboard motor that hung off the transom. All the J/24 boats were tied in slips, so it was an easy matter to walk out to the boat and get on. The motor helped to get out of the slip so the sails could be

raised, and to get back into the slip upon returning. We sailed several summers on the J/24, often going out to Brewster's Island and The Graves, which has an old lighthouse on it, at the eastern-most point of the harbor.

We began to consider getting into cruising—essentially a form of camping, using a boat instead of a tent. I decided to take the cruising course offered by the Sailing Center. This was a weekend experience. We met at about 5:00 p.m. on a Friday night at the Sailing Center. There were four of us plus an instructor. Again, I was the old guy, but the other three were at least in their thirties and married. Two were from Texas and owned a boat together, and had come to Boston to get some practical experience. We bought a minimum amount of food, planned a course from Boston Harbor to Marblehead, and got on the 30-foot boat—something similar to a Sabre 30. A typical 30-foot boat will have sleeping accommodations for four or five people, and a galley (kitchen) area. By the time we departed it was about 9:00 p.m. and dark.

It was my first experience at night, but I think we were all confident, because we had an instructor aboard. As we sailed out past the sewerage treatment plant, we could see only the lights along the shore, and a few blinking buoys. There were fireworks over Revere Beach. As we neared Marblehead at about midnight, we could hear waves breaking on a small mass of rocks named Tinkers Island. We found the buoy marking the entrance into Salem Sound between Children's Island and Marblehead Rock. Further on, we found another buoy marking the end of a line of rocks we needed to avoid. We sailed into Salem Sound, and anchored for the night between Manchester-by-the-Sea and Misery Island. We got to sleep around 1:00 a.m. or so.

The next morning, we traveled east toward Gloucester. As we students took turns at the helm, it was clear that one of the sailors from Texas knew what he was doing, but the other did not. I wondered how their sailing later with their wives was going to work out. We anchored for lunch in a little bay near Gloucester, and proceeded on to Rockport, about 20 miles from Marblehead. Rockport Harbor is small with no public moorings, so we tied up to a pier that has the Sandy Bay Yacht Club building on it. The tides vary about 10 feet in the harbor, and it was necessary to run extended mooring lines to account for the tides, and to put up a fender board to keep the boat off the pier pilings. It was all a learning experience.

We cooked dinner over a charcoal grill attached to one of the railings on the boat. At the end of the meal, one of my classmates lost the lid of the grill overboard. As darkness descended, we spent time on the veranda of the Sandy Bay Yacht Club talking with one another. The next day, Sunday, we began the return trip to Boston. We used the spinnaker several times, the last being in the North Channel into Boston as a freighter was coming in. It was exciting (and nerve-wracking) to race the freighter to get out of the way so the ship could pass down the channel.

By 1999, Caroline and I had become convinced we wanted our own boat. While the Boston Sailing Center was a good option for us, the boats were used heavily and it showed; the Sailing Center held Wednesday and Saturday races in the summer and winter, and sometimes there were none available. We had done a lot of day sailing and wanted to try cruising. We had spent a lot of emotional energy wondering if it were the right thing to do and what would be the impact on our lives and our finances, because Stow where we lived was about 50 miles from the nearest water. On weekends, we traveled from Stow to harbors along the North Shore from Newburyport to Boston, and as far south as Greenwich in Rhode Island. I consulted sailboat owners at work for advice. “Don’t get a bigger boat than you can afford not to use,” was about the best advice I received. “Don’t go about it thinking it is the only boat you will ever buy,” was another. Another friend at Lincoln Laboratory, who was a highly competent sailor, suggested a dealer in Manchester-by-the-Sea. The dealer located a C&C 30 named Tripoli in Marblehead Harbor. We took the plunge into boat ownership in the fall of 1999. It opened a world of new experiences, both fun and challenging, and a whole different lifestyle—which we weren’t expecting. In memory of my dad, we named the boat Raymond V—his first name and the letter “V” for Vernon, his middle name.

The Raymond V had the amenities we thought we wanted—a small galley with a propane stove, icebox, and sink; a small head (bathroom); berth in the bow; an onboard fresh water plumbing system; a chartplotter (a moving map display connected to GPS that showed our position and other pertinent data on an electronic nautical chart); an autopilot; and an inboard diesel engine. It was extremely well equipped and became our classroom for learning to be sailors together, and how to divide the work of sailing between us. The boat was 30 feet long overall, the draft (depth below the waterline) was six

feet, and the mast reached about 52 feet above the water. We spent two years learning to sail her, and also learning all her idiosyncrasies. We acquired a mooring in Salem Harbor, between Salem and Marblehead, and our first task was getting the boat from the dealer in Manchester-by-the-Sea to the mooring, a distance of about five miles. As luck would have it, the wind was gusting 15 knots or so from the direction in which we wanted to go. Wanting to be cautious, we had only the headsail (jib) up, but it quickly became apparent that our experience was no match for the conditions. It became necessary to get the jib down and to tie it to the safety lines along the boat in somewhat rough conditions. Caroline took the helm, praying the whole time as I went forward to wrestle with the sail. We motored on to the mooring. When we got to the mooring, we discovered the bow was about three feet above the water and we had no tool to reach the mooring lines hanging from the buoy in the water. We called for help and waited until the mooring company could come out and help us get tied up—an inauspicious beginning to the sailing life.

Even though we had bought the boat thinking of cruising, we never stayed overnight on her. We discovered that the space below deck was very cramped, and I kept hitting my head on various points in the cabin ceiling. Perhaps we did not have enough confidence in ourselves to plan and conduct an overnight trip, but we had many day trips and took friends and family with us on many occasions. It was all a learning experience; gaining more confidence and learning the other parts of the sailing life—e.g. where to go for diesel fuel, making repairs to parts that fail, finding a yard to put the boat up for the winter, knowing where the water was less than six feet deep, learning the tides (which ranged from six to nine feet in Salem Harbor), developing a routine to shut the boat down at the end of a sailing trip, etc. And, oh yes, paying for insurance, a mooring license, an excise tax to the town of Marblehead (our mooring was on their side of Salem Harbor), annual mooring inspection and service, paying a yard to store the boat and for any repair work they do, and getting the sails cleaned and repaired every two years. To save a little money, we learned to sand the boat bottom and coat it with special paint, keep the exterior woodwork well varnished, make simple electrical and plumbing repairs, polish the exterior stainless steel every year, service the toilet, inspect gear regularly, install and remove sails, service the fresh water plumbing, and keep the electronics operating.

Toward the end of 2002, we became itchy for a bigger boat. This “itch” is, indeed, another sailing bug bite, and comes upon all boat owners at some time. Caroline and I had been several times to the two boat shows in the Boston area—the Newport Boat Show in September and the Boston Boat Show in February. We saw lots of desirable boats, and lots of boats way beyond our means. By 2002, we had settled on two makes—Tartan, made in Ohio, and Halberg-Rassy in Sweden. Both brands were represented at the show, and we looked at them carefully. The Tartan won over Caroline and me with its interior design. It seemed more airy and light inside and had lots of storage space. We bought the 35-foot Tartan 3500 at the show. While an increase of five feet in length does not seem very large, the interior volume increases roughly by the cube, so it was much roomier than the C&C 30. Importantly, I did not hit my head anywhere in the cabin. We named the boat *Augusta True*. “Augusta” was the name of one of Caroline’s grandmothers, whose gift of stock to Caroline in about 1958 had made the purchase possible. “True” was Caroline’s middle name before we married.

We spent the first two years learning to sail this new, larger boat. Our first venture overnight was in October, over a Columbus weekend. We decided to go to Provincetown, Massachusetts, at the far end of the Cape. We went first to Scituate, about 20 miles south of Salem Sound, and then sailed across Cape Cod Bay, another 20 miles, and found a slip inside the harbor. As luck would have it, the winds came up out of the west, and the harbor was extremely rough—too rough to attempt to sleep aboard the boat. We stayed in a hotel in Provincetown two nights, at which point the winds appeared to be decreasing. We decided to leave and head back to Scituate, and, of course, the wind was from the direction we wanted to go. The seas were still very choppy and rough, so we motor-sailed all the way, tacking back and forth as we went to avoid heading directly into the waves. We were eight or ten hours getting across the bay and found a little shelter from the wind near the land. We were able to turn toward Scituate at that point, where we arrived—exhausted—just as it was getting dark. Since it was October, the darkness came early and overnight temperature went quite low. We were unprepared for the cold, so awoke with little real sleep.



The Augusta True, near Marblehead, Massachusetts. | Photo: David Kettner

The trip the next day to our mooring was uneventful. The sun was out, and the skies were clear. We arrived at the mooring and packed up to go home. I called for the launch several times before realizing they had a reduced operating schedule in October, and were not operating that day, so we faced another cold night on the boat. The following day we were finally home again. I got back to work two days later than planned.

By this point, you might say we were full-fledged sailors. The following year we made more overnight trips with the boat, continuing to learn the boat's systems and how it liked to be sailed. The journeys were short in the beginning—to Boston Harbor from Salem Harbor, to Ipswich, Gloucester, and the Isle of Shoals off the coast of New Hampshire.

At the Isle of Shoals, all the simple things that could go wrong did, all in one overnight stay. We ran out of propane for cooking, but a little portable grill filled in for us. Three or four light bulbs all failed—within a few hours of one another. We had no spares aboard, and never figured out why they burned out.

Over time, we joined the Blue Water Sailing Club, which had organized activities for 11 months of the year. We made numerous trips to Maine in the summer, visiting not only Boothbay Harbor, but many others from Casco Bay to Acadia on Mount Desert Island. We also went south to Cape Cod and Block Island. Our longest trips took us down east to Grand Manan Island and St. Andrews, New Brunswick, and westward to Mystic Seaport Museum and New York City. Most of these adventures were in the company of other Blue Water Sailing Club members, who introduced us to the social aspect of sailing. The sailing bug had become successfully lodged in us, and we were happy it had. The rewards of sailing are many. The sailing life also involves being a plumber, diesel mechanic, electronics engineer, painter, astronomer, photographer of sunsets, and all around problem solver. For an engineer, a boat is the dream situation. Operating and maintaining it requires a broad span of knowledge and experience, from aerodynamics and hydrodynamics, to simple physics, to some astronomy and advanced electronics. We experienced the fun and thrill of driving the boat at six to seven knots, heeled over 10 to 15 degrees, with the wind blowing 10 to 15 knots on our face while we

sensed the comfortable motion and the power. We also endured eight or nine hours motoring 50 miles because there was no wind. But a boat also provides experiences like entering a new harbor from the sea rather than land, quiet anchorages with various sea and bird life, and learning to collect and cook mussels. We saw many different birds—eagles, loons and puffins—and sea life—whales, dolphins, and a sunfish. The evenings sitting and enjoying the sunset were always calming and relaxing. We made many sailing friends and enjoyed the impromptu get-togethers. All sailors have interesting stories to tell, and the gatherings were ripe with laughter and practical information. We had many adventures in fair and stormy weather, made sure we never ran aground, and appreciated being out on both water and land. In time, as we aged, Caroline became less able to help manage the boat—getting on and off from a launch became too difficult, and our situation became reminiscent of my mother and father. After 17 years with her, we sold Augusta True two years ago to a man from Georgia. He bought her because his dream in life was to sail in Penobscot Bay in Maine, so the boat has stayed in New England for a while. The first year of his ownership we were in contact often, with help how to set up the various systems for the season, where to find various things on the boat, and with advice where the good harbors are located, what guidebooks to have, and the like. In essence, we traveled to Maine vicariously, and it has been interesting to learn where he has been traveling. In this experience, we learned how much we really missed being out on the water. This year, we met him again at the beginning of his second trip to Maine, and stayed in touch with him all year. He's hoping to get to Newport and Nantucket this year. So, while we no longer own the boat, we still enjoy imagining where it is and how much we loved being out. Once the sailing bug bites, it never lets go.



About David Kettner

I grew up in Utah and Montana, and came to MIT in 1961. I was able to take advantage of two electrical engineering options in Course VI – the Coop program and the VI-2 program, and graduated with two degrees in 1966. I stayed one more year for the Electrical Engineer degree, then started working for MIT Lincoln Laboratory in 1968, where I worked for almost 38 years. As a Laboratory Staff member, the importance of writing clearly and succinctly was drilled into me by all my supervisors, and I have tried to carry those lessons into an entirely different type of writing from the dispassionate technical exposition. Joining the memoir group has been a significant help to me, and I've enjoyed meeting and learning about the group members.

Bioengineering at MIT – A Long Labor and a Painful Birth

Laurence Retman Young

Edited by Leslie Young

These sections, describing the early days of the study of bioengineering at MIT, are drawn from Prof. Young's memoir manuscript, "Around and Around".

Continuing a long-standing tradition as a father and daughter co-author team, Leslie Young has edited the manuscript alongside Larry. More sections will be forthcoming in further publications, and we hope you will enjoy these histories and the joyful memories that fill them.

Bioengineering at MIT

We began bioengineering education at MIT with nothing. Going back to the early sixties, we had no department, no degrees, no curricula, no funding, and no mission statements. We had no student admissions and no dedicated faculty slots. We offered a large number of courses without any unified goals or coordination of requirements. We had no teaching labs, nor means of introducing engineering students to clinical practice.

So what did we have that propelled MIT and Harvard into leadership in this evolving field during the 60s and 70s?

First of all, we had enthusiastic and optimistic faculty. We organized courses around topics we wanted to teach. We got together across discipline boundaries to offer courses to eager and exceptionally talented students. We formed collaborations, between MIT, Harvard Medical School (HMS), and the local hospitals. We followed the money—from private foundations and the government. Enough money was offered by the National Institutes of Health (NIH) to consider founding a new medical school focused on application of the physical sciences to the life sciences. And we won support for Program Projects in Biomaterials and in Rehabilitation. We were swept up in the post-war optimism that allowed us to believe that we could overcome all obstacles with technology. Finally, we were blessed with academic leaders who saw the boundaries between life science and physical science as opportunities for advancement—in education as well as research—rather than insurmountable barriers.

The evolution of bioengineering is described in Walter Abelmann's history "The Harvard-MIT Division of Health Sciences and Technology: The First 25 Years, 1970–1995." The detailed listing of subjects, instructors and programs is contained in "A Guide to Biomedical Engineering and Physics at MIT and Harvard," prepared by the H-MIT program in Health, Science, and Technology (HST), January 1976. I am grateful to Chuck Oman, then the Helmholtz Associate Professor of HST, for recovering this valuable document.

Each of us has a unique story to tell—of how we grew from a collection of individual labs and lectures to a discipline that is vital and widely recognized. In this look back over 60 years I trace my own journey through this evolution—from graduate student in

Instrumentation in 1960 to Chair of MIT's Committee on Engineering and Living Systems in the 70s, and I recall the contributions of some of the people along the way.

By the 60s, there were over a hundred "courses" (which we at MIT call "subjects") related to bioengineering, loosely defined. Most of these were devoted to the interests of an individual professor and were given irregularly. They ranged from freshman and sophomore physics with examples from biology to ground-breaking subjects in Quantitative Physiology for seniors. In response to the NIH interests, we had organized the Biomaterials Science Program; the Rehabilitation Engineering Center; the Biomedical Engineering Center for Clinical Instrumentation; and research programs in Nuclear Medicine, Optimization of Radiation Dose, and others. Each of these federally funded centers provided support and training opportunities for graduate students.

My journey overlaps the birth of "bioengineering." Many of us have similar tales to tell—but all share one common thread. From our curiosity about biology or our interest in disease, we stumbled into the possibilities for technology to make a difference. A big difference. My own adventure began with the quantitative physical description of the way the vestibular system in the inner ear stabilizes the eyes in space when the head moves; and how it allows us to sense up and down, and to avoid disorientation—even in flight. I was lucky enough to fall in with an amazing crew of students and faculty at MIT at just the right time. I was lucky enough to be at MIT, first as a student, then as a faculty member, and eventually as one of the pioneers of our graduate program in Biomedical Engineering. I was further lucky in my timing—Sputnik was launched and began the Space Age in 1957—the year I graduated from MIT.

This is my story, but I was only one of over 100 faculty, from MIT and Harvard, who assisted in the birth of the new field we grew to call "bioengineering."

Looking back to the 1950s and on through the 60s, the growth of this new academic discipline may seem inevitable. Following World War Two, with the development of new tools to analyze complex systems and the parallel emergence of technology applicable to studying living systems, the time was right for the birth of a bioengineering curriculum. C. P. Snow's influential lecture, "Two Cultures and

the Scientific Revolution,” had the impact of awakening us to the sacrifice of breadth which followed from our disciplinary schisms. Humanities disrespected science and science rarely took notice of the humanities. Even within science itself, the traditional disciplinary divisions inhibited the interdisciplinary collaborations that were calling out to be recognized. Biology was on the cusp of emergence as a quantitative field. The double helix was only revealed in the 50s. When I went through the five-year undergraduate joint program between MIT and Amherst College, I successfully petitioned to skip biology in favor of chemistry’s Quantitative Analysis. Whether or not we were in the sciences, the boundaries were hurdles rather than “on ramps.” And they were daunting. One of the attractions of MIT for me was the chance to meet—and maybe even study with—Prof. Norbert Weiner, whose book “The Human Use of Human Beings” introduced “cybernetics” and the potential for consideration of the brain as a very special kind of computer. I only got to meet him a few times, introduced by my thesis advisor, Larry Stark.

What exactly was “bioengineering” back in the 60s? We didn’t even have a recognizable name—somewhere in the academic mix between medicine and technology? When Larry and I began a small startup in Cambridge to develop eye movement monitors we called it “Biosystems Inc.,” which seemed sufficiently unrestricted.

With or without a recognizable name, a new industry was emerging, and it would need a new breed of engineer. Scanners and lab computers, artificial organs, and prosthetic limbs all were emerging technologies. The new industry called out for education in a field we would come to call “bioengineering” or “biomedical engineering” or even “biotechnology.” Medical education had barely changed since the Flexner Report of 1910 identified the challenge of teaching physical science to medical students without watering down the content. Where better to bring together these two branches of physical and biological science than here in Cambridge? East Cambridge, between Kendall Square and Central Square, was smelly and decrepit in the 60s. It is now home to the Broad and the Whitehead Institutes and is the world’s cauldron for biotechnology. So who are we, and how did we evolve?

Whatever we called it, one couldn’t deny or ignore its existence and its growth. From a handful of individual collaborations and a few isolated subjects, our field evolved explosively. The story is rich and complex, involving two great universities and two previously separate fields—

life science and physical science.

In this memoir I will restrict myself to my own journey—from an Aero-Astro graduate student in the early 60s to a faculty member leading the new Interdepartmental PhD Program in Biomedical Engineering. Along the way, I played a role in the establishment of HST and Bioastronautics, but those are separate tales.

My thesis advisor, Larry Stark, liked to tell the following story to define our field. The brilliant and eccentric psychiatrist and mathematician, Warren McCullough, was asked the following question over his second Manhattan at his own “faculty club”—the F&T Deli in Kendall Square: “Warren, we know what engineering offers to biology: instrumentation, sensors, math models and so forth. But what does biology offer to engineering?” Warren’s answer was predictably short and direct. “Problems,” he said. And problem-solving is what MIT engineers thrive on!

Even within our emerging field of biomedical engineering, we saw our own culture gaps—between life sciences and physical sciences and between engineering practice and engineering science as it had emerged following the successes of World War Two. When it came to discussions of clinical exposure for HST Medical Engineering and Medical Physics (MEMPH) students we would argue that an engineer didn’t need to repeat a circuit design once it had been mastered and our MD colleagues would vigorously disagree. They would argue that no two cases (or patients) were the same and that professional success depended upon seemingly endless repetition.

And then there were the surface issues—trivial, but important. What kind of lab coat and identification would the biomedical engineers wear in the hospital? Where would they eat?

Even up at the level of the HST Executive Committee these cultural wars were being fought—or suppressed. Pride and prestige were always lurking somewhere. Apparently, a major objection was aimed at Henry Rozovsky, Dean of Harvard’s Faculty of Arts and Science. His proposal was that MIT faculty in HST would not only carry Harvard professorships—but would be listed as such under Harvard’s Faculty of Arts and Science. “My God,” exclaimed one classicist, “the next thing you know, professors in the Business School will want to be

listed!" It certainly supported the old saw that faculty meetings are so rancorous because the stakes are so small!

Consider the reasons that Harvard and MIT, two of the world's recognized leaders—in science and technology on the one hand and in medicine on the other hand—took so long to jointly form the Program in Health Science and Technology. As Derek Bok points out "Every Harvard President early in his term begins to think that there should be much more collaboration with MIT." He points out that "it is, after all, a remarkable thing to have two of the world's most renowned research universities only two subway stops apart" or just down the Charles River. Individual collaborative research projects, ranging from sanitary engineering and public health to high energy radiation therapy, had been going on for decades—and blossomed in the post war atmosphere of peaceful uses of technology. Walter Abelmann's history of HST traces the long background and multiple obstacles involved. My question is not "Why did it happen?," but why did it take nearly a half century for Harvard and MIT to join forces in research and education in biomedical engineering? Part of the answer lies in funding. There was a lot on the table—but not enough. According to which account you read, the proposal from NIH's Director, Jim Shannon, was to fund MIT for a new medical school based on science. The clinical training would be conducted at Massachusetts General Hospital (MGH), which would require a substantial additional contribution. That was too much for MIT, led by its new president, Howard Johnson, to swallow and the proposal was declined. But it got a lot of the faculty thinking—and eventually led to the formation of HST. The academic leadership at MIT (Weisner and Rosenblith) could not ignore the discussions begun at Harvard Medical School (HMS) about establishing a major biomedical engineering program within HMS. Many of us participated in a substantive summer study at MIT's Endicott House in Dedham. Finally, we began to hear from all sides about how to successfully bring about a joint enterprise.

The Interdepartmental Doctoral Program in Biomedical Engineering was proposed by the MIT Committee on Engineering and Living Systems (CELS), established by Dean Gordon Brown. Dean Brown asked me to take over the CELS in 1967 and encouraged us to define a PhD curriculum in Biomedical Engineering within the MIT School of Engineering. I was involved from 1967 through the establishment of its natural successor in HST, the Medical Engineering and Medical Physics PhD program, begun in 1978.

Bioengineering and the Aero-Astro Department

As far as I know, MIT's earliest bioengineering collaboration was with the Harvard School of Public Health—early in the 20th century. But by the 1960s, there was little visible collaboration between MIT engineers and biologists or physicians. Little—but not none.

A human radiation facility on the corner of Mass. Ave and Vassar Street delivered experimental radiation doses.

Prof. Walter Rosenblith edited a volume for the IRE (now the IEEE) on biomedical applications and included Prof. Bill Seibert as a senior faculty member. There were a handful of other brilliant faculty members at MIT who were attempting to apply mathematics to life sciences—but there was no academic or research organization to draw it together. Possibly the most influential group among us were those invited participants at the first Josiah Macy Foundation conference, held in New York in 1948. Warren McCulloch attended, and Norbert Wiener introduced the concept of cybernetics which laid the groundwork for his influential book. The theory of servomechanisms, developed during World War Two to improve the accuracy of gunsights and artillery, suddenly seemed applicable to the regulation of physiological systems as well. Stability and oscillations were observed in the regulation of blood pressure. Homeostasis was identified as a basic principle in physiology.

I became aware of the pioneering work of Larry Stark, a neurologist who just moved from Yale to MIT to extend his work on the pupil reflex to light as a servomechanism. Larry set up a lab in the Research Laboratory of Electronics (RLE) and the Electronic Systems Lab, guarded carefully at its entrance by an owl which would track all who entered or left. I did my ScD thesis there on human eye movements as a sampled data system. When I joined the MIT Aero-Astro faculty at Doc Draper's invitation in 1962, there was no such thing as "bioengineering." Within the Aero-Astro department we had nothing—no courses, no labs and no faculty research devoted to applications of theory in biology or medicine. However, Doc discussed his own interests in the capabilities of men and machines in performing the kinds of sensory-motor and cognitive tasks inherent with spacecraft guidance and navigation. He reminded me more than once that he had studied psychology at Stanford before moving east. He assigned Prof. Phil Whitaker and me to work with him on a paper for the International

Astronautical Congress. We presented it in Warsaw to international acclaim and lots of vodka. Both the paper and my presence as “Draper’s Boy” were important for my early career and gave me recognition on both sides of the Iron Curtain. Doc encouraged me to continue the PhD work that I did with Larry Stark in RLE on the subject of mathematical models of human eye movements. He gave me space—in fact the entire basement of the empty Building 41—to set up an eye movement lab. He supplied the necessary start-up funds which allowed me to buy used optics from Edmund’s Scientific.

When it came to research funding, with my background in eye movement control and my interest in space travel, the obvious sponsor was NASA. Early in the Apollo era, NASA’s interest in the protection of astronauts from space motion sickness was significant. Thanks to the support and confidence shown to me by Capt. Ashton Graybiel of the United States Navy, head of the Navy’s Aeromedical Lab in Pensacola, and Dr. Walton Jones, head of Life Sciences for NASA, we were funded to explore human spatial orientation during unusual motion—on Earth and in space.

At that point, my former advisor, mentor, and lifelong friend Prof. Y.T. Li stepped up to help me and my first PhD student, Jacob Meiry. We designed a horizontal human acceleration device which we installed in Building 17A, part of the former “blow-down wind tunnel.” Together we established the Man Vehicle Control Lab—later shortened to MVL. Meanwhile I became more and more aware of the developing interest in biomedical engineering at MIT.

Our first Aero-Astro course offering in bioengineering grew out of a summer course I organized on topics in Aerospace Medicine. Sherman Vinograd, MD, had been leading a NASA effort to develop a standard set of lab facilities for use in human space flight. It was called Integrated Medical and Biological Laboratory Measurement System (IMBLMS). We worked with Richard Brubaker, an ophthalmologist at Massachusetts Eye and Ear Infirmary (MEEI), to develop a non-invasive device for measuring venous blood pressure. (Incidentally, several students got up and left my seminar early when they learned I was discussing pressure in veins on the human body and not on the planet Venus.) Sherman was preparing to return to Wisconsin after years at NASA HQ, and he needed to tune up his clinical skills.

A year with us at MIT, combined with hands-on refresher training at Beth Israel met his needs. In return, he helped me put on our first Aero-Astro bioengineering subject. We covered everything from acceleration tolerance to dealing with thermal stress. Sherman called in his friends and former NASA grantees as guest lecturers. Among other star performers was Raymond Loewy, the famous designer of everything from the post-war Studebaker to the Coke bottle. Loewy taught us about individual space and habitability for long flights.

This summer course evolved into a regular graduate course in Man-Machine Systems, relating to displays, controls and decision aids for the pilot and for air traffic control. I joined forces with my dear friend Tom Sheridan from Mechanical Engineering (MechE) to offer this joint course for grad students in Aero-Astro and in MechE. It has continued over the decades. Aero-Astro continued to support the subject with talented faculty, including Ren Curry, who moved on to NASA's Ames Research Center, Rafi Sivan, a leader in "modern control systems" on sabbatical leave from the Technion, and Missy Cummings, the first navy pilot to land on an aircraft carrier. Support from MechE was more difficult to obtain. Tom was frustrated by the absence of additional faculty in MechE and eventually accepted a joint appointment in Aero-Astro—where he and his work were more appreciated. The basic subject matter was renamed to the more politically correct "Human Engineering Systems" and has continued, to this day. It serves as one of the core subjects for graduate study in Human Vehicle Systems, within HST and Aero-Astro.

Some, if not most, of the early bioengineering subjects at MIT grew out of the mutual interests of faculty from different departments or labs. A good example, for me, was the graduate "Seminar in Sensorimotor Processes" which I taught for three hours every Wednesday night. The subject of the seminar was adaptive control—in physiology and in systems. I teamed with Profs. Dick Held and Emilio Bizzi of the Psychology Department. Dick, along with Prof. Alan Hein, had pioneered experiments showing the importance of active, rather than passive, motion in allowing cats to adapt to movements on a centrifuge. Klaus Hepp, on sabbatical from ETH Zurich where he held the theoretical physics chair once occupied by Einstein, was a friend who became increasingly interested in the neural circuitry underlying saccadic eye movements. Bizzi was a leading neurophysiologist,

recruited by department head Hans-Luke Teuber, to strengthen that department's basic science core. Emilio went yet deeper and recorded single units in the monkey brain stem during adaptation to head movements while they were wearing image shifting spectacles. And I related it all to "Model Reference Adaptive Control Systems," which had been introduced by Phil Whitaker of the Aero-Astro Department. The students and the faculty debated the fundamental nature of sensor-motor adaptation—in animals and machines. It was the most enjoyable teaching activity in my entire career! I hope the students felt the same.

The last graduate course I introduced at MIT was Flight Simulation, begun as a joint effort with my Aero-Astro colleagues, Profs. Bob Simpson and Antonio Elias of the Human Transportation Lab. Their Boeing simulator, contributed to MIT when the US supersonic transport program closed down, made for realistic demonstrations. I taught mostly about simulator motion systems and their relation to pilot disorientation.

Within my first year on the faculty, I was called in to meet our Dean of Engineering, Gordon Brown. To my surprise, he asked me to take over MIT's Committee on Engineering and Living Systems (CELS). The goal was to establish a doctoral program across departments. MIT already had several senior faculty in the field. I knew only Prof. Murray Eden of Electrical Engineering and Prof. David Rutstein, the head of Preventive Medicine at the Harvard School of Public Health. They taught a course in Biomathematics, which I inherited and offered in the early 70s as an alternative to Biostatistics for HMS students who were facing a "math requirement." I emphasized feedback control systems in the context of homeostasis and attracted a small but dedicated following. Murray moved on to the NIH where he established and led their Bioinstrumentation activity.

I was only 27 years old, in my first year on the faculty, and by far the least experienced member of our new committee. Absent any senior guidance, I proceeded to organize an Interdepartmental PhD program in Bioengineering, reporting to Irving Sizer, Dean of the Graduate School. I followed the same structure as the Interdepartmental Program in Instrumentation—Draper's structure under which I earned my doctorate.

We organized the program with few required courses. Over the objection of many students we required a passing grade in Biochemistry to at least introduce the engineering students to some basic medical science. We also needed enough rigor to assure Prof. Ascher Shapiro that our new program would not be an easy “back door” to an MIT doctorate!

Admission, as I recall, was by oral exam and interview. The PhD program was listed in the “MIT Bulletin” under several departments. We attracted many outstanding early PhD candidates.

The assignment from Gordon Brown to lead the MIT Committee on Engineering and Living Systems was a pleasure for me. I was met with encouragement everywhere. Everyone I asked agreed to serve in the planning and implementation of the Interdepartmental Doctoral Program in Biomedical Engineering. And what an outstanding group of colleagues and friends they were.

From Nuclear Engineering, we recruited Prof. Gordon Brownell, whose lab at MGH pioneered Positron Emission Scans (PET). Mechanical Engineering was already well represented in Biomedical Engineering, encouraged by its department head, Ascher Shapiro, whose pioneering work in Fluid Mechanics was applicable to blood flow on the newly developed artificial heart. He was backed up by Prof. Forbes Dewey. But the powerhouse in MechE was Prof. Robert Mann, a designer who was attracted to the field by Norbert Weiner to work on the MIT Arm, a motorized above-elbow prosthesis. Chemical Engineering contributed Profs. Earl Merrill and Clark Colton, whose specialty was in the preparation of blood vessel surfaces that would resist the formation of blood clots. Prof. Bob Rose was called in from Materials Science. He, Prof. Igor Paul, and my college buddy—the orthopedist Eric Radin—specialized in joint wear. Profs. William Siebert and Larry Frishkopf from Electrical Engineering introduced nerve impulse modeling. Harvard’s Division of Engineering & Applied Physics was home to Prof. Richard Cronower.

We admitted and graduated about one student per year at first. Rena Bizios studied with Prof. Clark Colton in Chemical Engineering and went on to become Biomedical Engineering (BME) Department Head

at Rensselaer Polytechnic Institute (RPI). Byron Lichtenberg came to study with me because he was advised by Prof. Bob Mann, his SM advisor, that it would be the most direct path to becoming an astronaut. And he was right, having been selected as America's first Payload Specialist to fly my experiments on the Space Shuttle. Greg Zacharias left the Instrumentation Lab to study with me on human spatial orientation and went on to found Charles River Analytics and later to become Chief Scientist of the US Air Force (USAF). Chuck Oman joined the MVL and stayed as a faculty member in Aero-Astro, holding HST's Helmholtz Chair and has remained a close friend and associate to this day. Prof. Jacob Meiry served on the Aero-Astro faculty in Instrumentation and made important early contributions to modelling human spatial orientation, but drifted out of the field.

Across the board, our group of faculty interested in bioengineering didn't get much attention at MIT until money became an issue. As I heard it, the Director of NIH, Jim Shannon, was convinced that the basis for medical education in the US was completely misplaced. Instead of building on chemistry, especially biochemistry, we should be building on physics. But there were no existing medical schools which were of top level and willing to build a collaboration with engineering or the hard sciences. He needed to start fresh and introduce a medical education program which was rooted in the physical sciences. But where? The academic hierarchy was already frozen; not Johns Hopkins or Yale or the like. Only MIT stood out as a major engineering school, recognized for physical science leadership, without an existing medical school. Shannon reportedly held out a multi-million dollar offer to induce MIT to move ahead. That was a lot of money back in the 60s! But MIT had just inaugurated a new president, Howard Johnson, who was hesitant. The venture would require a strong clinical partner, including faculty. Harvard already had this loose affiliation with top hospitals, and the idea was to bring MGH in as the medical partner. But there would be an additional cost to MIT of upwards of another 100 million dollars. Too much to swallow, especially for a new leader. And most of all, we were lacking a strong individual who could build the bridges between medicine and engineering—and between MIT and Harvard. Several decades earlier, when MIT was about to merge with (or be acquired by) Harvard, there was an outpouring of protests from MIT alums which eventually squelched the deal.

And then a miracle happened!

MIT leadership identified a world class physician, highly respected within the Harvard Medical community, distinguished, and well-spoken with administrative experience in medicine. And he was a Harvard alumnus as well.

His name was Irving London, and he was then Chief of Medicine at Albert Einstein Hospital in the Bronx. He was recruited to lead an extended summer study at MIT's Endicott House in Dedham. Almost all of the interested parties at Harvard and MIT were invited to attend; even me!

Walter Rosenblith, then Associate Provost at MIT, said of his 1970 recruitment of Dr. London "I was very impressed with his broad knowledge, his research, and his willingness to look at new institutional forms that had to be created at the frontiers where medicine, the physical sciences, and engineering meet. When it was time to find a director for this new enterprise, I was enthusiastic in supporting the selection of Dr. London. His appointment turned out to be most fortunate. He has guided HST into its present fruitful and prospering position." [from Walter Abelmann, *The Harvard-MIT Division of Health Science and Technology*, 2004.]

We discussed the economics of healthcare and how it would be altered by new technology. Jerry Weisner provided support from the top and HMS was represented by major players like Henry Rozofsky, Robert Ebert, and Eleanor Shore. By the end of the summer, a plan emerged and the Harvard-MIT Program in Health Science and Technology was born. I was appointed to the Executive Committee which met every Wednesday morning in London's office. The tasks of melding two proud and independent universities were not simple—and required endless negotiation. Whose class calendar to use and what to do about tuition? Could faculty be paid by BOTH schools? Who would grant the MD (Harvard) and the PhD (either one)?

To raise the money for the new HST Program, MIT brought in Walter Koltun from the President's Office. Walter would travel to Palm Beach and return with generous donations. Fred Bowman, a young researcher, added administrative support. And over all of these complex bi-university negotiations sat the calm and effective team of Rosenblith and London.

However, we still had no proof that this kind of engineering/medical training would be useful and accepted in the hospital environment. Then came another miracle. A charming and well-spoken young man, recently out of the Air Force, appeared on the scene. He had a PhD in Electrical Engineering from MIT and an MD from Harvard. He was an internist at Beth Israel Hospital. And everyone liked Roger Mark. Roger was recruited as co-director.

As time went on through the 70s and 80s, HST became the home for graduate education in bioengineering. The PhD track through HST, called Medical Engineering and Medical Physics (MEMP) was formalized and grew its own procedures for admissions and research, with the leadership of Prof. Ernie Cravalho. I continued to administer the interdepartmental PhD program through the 80s, assisted by Gordon Brownell who stepped in while I was on sabbatical at Stanford in 1987. But it was by then redundant and its functions were transferred to MEMP. By then, Biomedical Engineering had leapt out of the cradle and was toddling toward recognition as an independent department with world-class faculty and students. Today's version incorporates MIT's Institute for Medical Engineering and Science (IMES) and collaborates with biotechnology in one of MIT's major impacts on modern health and society.

By the 1970s, the bioengineering educational activities began to attract the attention of others in the School of Engineering. We submitted and were awarded an NIH Training Grant. The focus of the training grant was the development of three undergraduate subjects in Quantitative Physiology (QP). Each would assume at least a Junior level of engineering ability (electricity and magnetism, fluid physics, feedback control theory, etc.). It would appeal to the growing number of MIT undergrads applying to medical school. Each subject would be accompanied by laboratory sessions. Over several decades the courses matured and attracted many of the School of Engineering (SOE) faculty. In the Fall, we offered "Cells and Tissues," led by Tom Weiss and Bill Peake of EE. Their extensive notes on the Hodgkin Huxley Equations for nerve transmission were later published as a significant textbook. In the Spring, we offered one course in Organ Transport Systems (heart, lung, etc.) organized and largely taught by Roger Mark and Forbes Dewey, and another in Sensorimotor Systems. This last one, which I directed for many years, covered vision, hearing, balance, proprioception, energetics and locomotion. For

each subsystem we recruited an outstanding engineering professor who made appropriate use of mathematical models, as well as active weekly labs. Among the key contributors were Bill Siebert, Larry Frishkopf, Bob Mann, Chuck Oman, Dan Merfeld, Conrad Wall, and Neville Hogan. It was great fun! Over the years, I have run into several of our alums who reported that they learned far more physiology in their undergrad QP courses at MIT than they ever did in medical school!

My emphasis on QP is not meant to imply the absence of other courses developed for MIT undergraduates. The 1976 edition of “A Guide to Biomedical Engineering and Physics at MIT and Harvard,” prepared by Chuck Oman for our Harvard-MIT Program in Health Sciences and Technology’s Committee on Medical Engineering and Physics, listed over 75 “Subjects of Interest to Biomedical Engineering Students” at Harvard and MIT. Of course most of these subjects were well established courses and were listed multiple times. But still, it represented the pool of talent and interest even before organized programs and curricula were introduced.

By now, in 2021, there is no doubt as to the effectiveness of Biomedical Engineering and the influence of the HST Program. The establishment of the Biological Engineering Department recognizes the importance of research and education in this vital direction.



About Larry Young

Larry Young was an “MIT Lifer.” Having profited from the “Combined Plan” that MIT had with selected liberal arts colleges, he graduated in 1957 with an SB in EE from MIT and an AB from Amherst. After a Fulbright in Paris, he caught the space bug and returned to MIT for an SM in EE and ScD in Instrumentation, supported generously by Doc Draper, who hired him as an Assistant Professor of Aero-Astro in 1962. And he’s been here ever since!

With Prof. Y.T. Li, he founded the Man-Vehicle Lab (now the Human Systems Lab) and went on to work in space medicine, applying cybernetics to astronaut spatial orientation and space motion sickness. That led to his experience as an Alternate Payload Specialist on the Space Shuttle. He later became the Founding Director of NASA’s National Space Biomedical Research Institute and Head of Space Education for its successor, the Translational Research Institute for Space Health. Meanwhile, back at MIT, as one of the founding faculty of the Harvard-MIT Health Science and Technology (HST) program, he established and directed its graduate program in Bioastronautics and was active as the Apollo Program Professor of Astronautics, Emeritus. He was elected to the National Academy of Engineering, the National Academy of Medicine, and the International Academy of Astronautics. At MIT, he was a varsity ski racer and served as ski team faculty advisor.



Jenny's Simple Shiitake Stirfry

Serves 4

Ingredients

1-2 cups (8 ounces) fresh Shiitake mushrooms
two medium yellow or orange bell peppers
3 tablespoons high-heat oil (such as corn oil)
1/4 cup chicken broth
1/4 tsp salt and a pinch or two of freshly ground black pepper
1/8 tsp of crushed red pepper or chili oil (optional)
1/4 cup chopped scallions
a splash of sesame oil.

Preparation

- Cut the fresh shiitake mushrooms into 1/4 inch slices, discard the stem tips.
- Cut peppers into 1/2 inch lengthwise slices, throw away seeds and stem.
- Place a large deep skillet over medium to high heat, add oil, then bell peppers and half the amount of scallions, cook for 2 minutes. Add Shiitake mushrooms and stir fry for another 3 minutes, so the mixture dries out a bit, then add the 1/4 cup of chicken broth.
- Stir regularly, adding salt and pepper, for 2 more minutes until vegetables are tender but not soft. Finally, top off with crushed red pepper or chili oil, and sesame oil to taste.
- Transfer to a serving platter, sprinkle remaining scallions on top. Serve with rice or noodles.

Enjoy!

Note from Elaine Shiang: This dish can be made with any mushrooms similar in size to Shiitake such as white, brown, oyster, etc. You can also add different sorts of vegetables, including parboiled broccoli, carrots, and even peas, etc., but I like the bright color and taste of peppers.

Finally, I asked Jenny about soy sauce, garlic, ginger, and she emphatically said “not necessary, keep it simple!”





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