

Nita Regnier

***Memoir
Writing
Group***

Winter 2020–2021

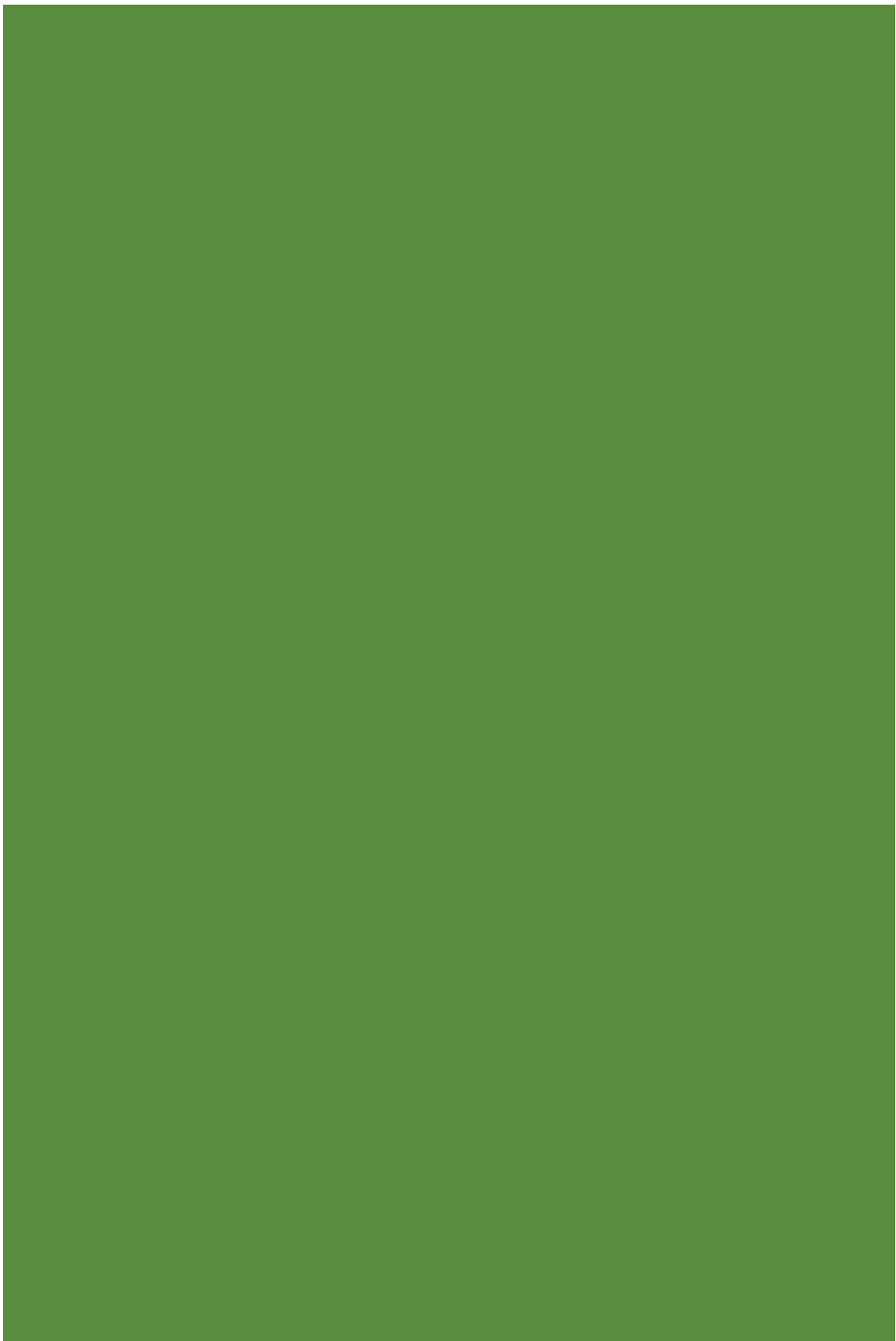
Sponsored by the Association of MIT Retirees

Selected Writings

Volume One



**Association of
MIT Retirees**



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Nita Regnier Memoir Writing Group

The memoir writing group was formed in 2011 by Association committee members Elsa Tian and Nita Regnier, a retired instructor in MIT's Program in Writing and Humanistic Studies. Nita led the memoirists for eight years as an active writer and teacher of the group until her passing at age 95, in 2018. Nita acted on her conviction that we all have a story to tell and are eager to tell it. She applied her career as a linguistics instructor to transform fledgling attempts to write those stories into engaging narratives. Shortly before her death, the memoirists renamed the group the "Nita Regnier Memoir Writing Group," as a tribute to her generosity and dedication. This gesture moved Nita and her family as the dedication remains as a symbol of gratitude for Nita's contribution and friendship towards the group.

Under the direction of Daphne Strassmann, a writing professor and memoirist, the group continues Nita's legacy of fascinating storytelling through the written word, thanks to the diverse group of writers, all with unique roots in MIT. Membership continues to grow and covers the full spectrum of MIT staff positions; Cambridge academics—yes, but many are from campus administration and from Lincoln Laboratory. Currently, the memoir group meets monthly online and will meet again on campus (parking is provided). The group enthusiastically welcomes new writers. If you are inspired to learn more, reach out to us at retirees.assoc@mit.edu.

About Bill Snow

Bill Snow was brought up in Maine. His long association with academia began and ended in Boston. He earned degrees at universities in Massachusetts, Utah, Wisconsin, and Virginia; at three more universities he didn't do as well. His degree from University of Wisconsin–Madison determined his career. After his terminal degree, he taught atmospheric science at academic institutions in Vermont and Boston. Of his affiliations with universities, serving as Staff at MIT's Lincoln Laboratory was the most stimulating and productive.

Bill claims to have retired three times: from U.S. Civil Service in 1994, from teaching in 2002, and from Lincoln Laboratory in 2009. In retirement, science has given way to more arts oriented endeavors, writing character sketches, and enjoying classical music. He was one of the original members of the Nita Regnier Memoir Writing Group, initiated by the Association of MIT Retirees in early 2011. He now resides near the Maine coast, in the same house he was born in 82 years ago.

Dead Battery! No Problem

Thom Opar

My wife Cathy and I married three weeks after her college graduation in May 1975, one year after my graduation, while I was a grad student at the University of Colorado. Like most young married grad students at the time, in addition to managing research and academics and learning how to become a couple, we had to deal with financial challenges. This brief story places us in Married Student Housing dealing with the crisis of a dead battery, a nearly empty bank account, and a new job.

Cathy and I struggled financially in the first months after our May 1975 marriage. Without a bulging bank account, access to credit or parental largesse, simply paying rent and buying food, on a \$300/month Research Assistant stipend, challenged our parsimonious tendencies. We lived with a simple rule—if you don't need it, don't buy it.

The country was in a recession when Cathy arrived in Colorado, only three weeks after she was handed her college diploma and a week after we walked out of the church side-by-side. Career-starting jobs for new college grads were rare and hard to find. Fortunately, Cathy's math degree and year-long, part-time computer programming internship during her senior year at the University of Rochester's Strong Memorial Hospital led to a job offer in November. She would take her first step into the IT world, a term still years from coinage, as a COBOL programmer for a Denver-based bank service company. Her monthly \$750 paycheck tripled our income and started us toward financial security, but old habits were hard to break—caution ruled. Thankfully, the Land Rover was designed for stressful conditions.

As a grad student in the AstroGeophysics Program, I occasionally conducted night-sky observing sessions at University of Colorado campus observatory. On a clear, still, moonless December night, I shared Jupiter and its four Galilean moons, Saturn with its stunning rings, and a few Messier Objects with an enthusiastic crowd. The observing conditions were perfect for a nightlong viewing session. The group was as eager to stay and fight the deepening cold in the open dome as I was. Hour-after-hour, I centered the telescope on interesting celestial bodies. The 'oohs' and 'aahs,' heard whenever someone peered into the eyepiece, interrupted my fact-filled orations.

I homed the telescope and closed the dome by midnight. After a short walk to Married Student Housing on 30th Street, I was home by 12:30 AM. With no morning classes, I was looking forward to sleeping in.

A shrill "Thom, wake up! The car won't start" shatters my dreamscape. Adrenaline jolts me from the warm caress of the waterbed to heart-pounding awakedness. With my residual grogginess, all I can muster is a confused "What."

With clear urgency, Cathy repeats her cry, "The car won't start. I'll miss the bus."



A young Thom Opar on his Land Rover days before he drives out to Colorado to start grad school in August 1974. | Photo: Cathy Opar

Cathy had decided to take the commuter bus to Denver as soon as she was offered the programming job. She didn't relish the thought of 'big city' driving. Taking the bus would save a few dollars. More importantly, her 'greening' sensibility compelled her to conserve. While riding the bus, the gas that could propel the Land Rover on the 26-mile trip would remain unburnt and in the ground, while time on the bus would allow her to twiddle her crochet hooks, fashioning ornaments for our first Christmas tree.

As the fog of sleep evaporates, I comprehend the situation. The solution is obvious to me because I already practiced it. My concerns quickly diminish. I slowly rustle from the bed. I have no need to hurry.

Cathy, unaware of my solution, doesn't share my lack of urgency.

"Thom. GET UP!"

"Ok. Ok. No need to worry. I'll get it started."

Not confident in my mechanical or electrical skills, she emphatically disagrees.

"I don't think you should be so cavalier with my time. I know it's a dead battery. There's nothing you can do to fix it right now."

I slip on a pair of faded jeans, don a plaid, flannel shirt, and slip on my sandals. Boulder winters are mostly snow-free and mild compared to icy Rochester. My heavy, well-worn Vasque hiking boots stay in the closet. We are a contrast in appearance as we stroll out to the parking lot, a long-haired, '70s grad student and an ERA-inspired, working-class woman wearing a dressy pantsuit over a white button-up shirt, accented, as usual, with a long, colorful, flowing scarf. Her unconstrained, wavy hair is all that remains of her recent hippie-ish image as the process of morphing into a serious businesswoman has begun.

As we get to the car, she hands me the key. Under her stern, arms-crossed gaze, harder than the Teton's granite and colder than the Arapahoe Glacier, I climb into the Land Rover. My left foot depresses the clutch; the right gently nudges the accelerator. I turn the key. Nothing happens. No lights blaze, no noises escape the hood. No 'rrr-rrr' no 'click-click-click.'

Thoughtfully, I deliver my diagnosis. "The battery is dead."

"No, kidding. That's what I said. Do you think Joe or Mary can drive me to the bus? I don't want to be late."

With as comforting a voice as I can evoke, I confidently reply.

"No need. I'll have it running in a minute. Get in the car. Put it in neutral. When you see me wave, pump the gas, twice."

I see her reflection in the rear-view mirror. Her confidence in my solution isn't rising as I walk to the back of the car. Her stony face glares as I open the back door. Bumping, thumping, and metal-on-metal scrapings follow, as I root in the rear to extract a four-foot-long pole. I slam the rear door, walk to the front and kneel out of her view. After more thumping and bumping, I wave, then shout, "Give it some gas."

The car lurches side-to-side, once, twice, then "VRooooom" it roars to life.

Visibly relieved, the granite erodes, the glacier melts, and with relieved incredulity, Cathy asks, "How did you do that?"

"Let me stow the crank. I'll tell you as I get you to the bus."

As we drive, I fill her in on a few details of the Land Rover that she clearly was not aware of. I tell her that this vehicle is intended to be versatile and reliable for long-duration, remote, off-road treks. The car must start in the wilderness, including the wilds of 30th Street Boulder, if the battery dies. Lugging extra batteries is not practical. The solution is a legacy feature borrowed from the Model T—a 'crank start.'

Once we had the ability to start the car, we could spare the expense of a new battery. Cathy agreed to wait to purchase a new battery, fully aware that she would incur an additional early morning burden. The battery didn't make it onto our purchase list. Her windfall would be used to expand her work wardrobe, repair her balky sewing machine, and buy us a pair of Holubar, sew-it-yourself down vest kits. Week-after-week, Cathy, in her newly sewn vest, covering crisp business attire, would pull out the crank, slide it onto the shaft, give it a hearty twist and wake up the sleeping car for the drive to the bus terminal.

After six weeks of crank-starting the Land Rover on dark and cold mornings, the battery made it to the top of our list. A positive slope on our bank account calmed our financial worries. We bought a new battery. Once again, a simple turn of a key started the car. Our early morning drama disappeared. The crank was stowed, never to appear again.



About Thom Opar

I retired from MIT Lincoln Laboratory in 2017. After three decades of service, where my long-held mantra 'A picture is worth a 1,000 words, but an equation is worth a 1,000 pictures' served me well, I realized that I have stories to share that can't be captured with mathematics. In an attempt to explore/develop a new approach to story-telling, I joined the Nita Regnier Memoir Writing Group. Now, after more than two years in the group, I have a trove of creative non-fiction; growing up in an ethnic enclave in Upstate New York in the 50s and 60s, coming of age academically, socially, emotionally in college in the 70s, managing 40 years of couplehood, over 30 years of parenthood and 5 years of widowerhood.

Part I:
Leningrad to
Yalta, in a
Rented Volga

*(or, Slipping through the Iron
Curtain with Bad Maps and
Backpacks)*

Lucy Wilhelm

It was our delayed honeymoon, a full year after our wedding. It was August, 1972. My husband Rob, a history buff, had taken a day trip by bus from Helsinki into the old Soviet Union a couple of years before and was eager to return and show me some of this forbidden land. "I've always loved Russian History," he'd said; "Wait till you see the statue of Peter the Great on his horse in full glory! We can do it on the cheap and stay in campsites. The Russians are courting tourists from the US and Europe now—they want hard currency, US dollars."

We were ready to help the Russians out with our tourist dollars, peek behind the Iron Curtain, savor what we could of this mysterious culture and find out exactly why the Big Russian Bear was so scary. Also, we'd been told the Russian ice cream was excellent. Our plan was to start in England, travel north through Scandinavia and enter through Finland. Our passports were current, and we had our Youth Hostel cards and our International Driver's licenses. We'd rent a Russian car and drive from the north to The Crimea on the Black Sea and back. We carried a small two person tent, sleeping bags, and new backpacks purchased at EMS (Eastern Mountain Sports) so we could stay in campsites in the USSR for an entire month. How hard or scary could that be? From the campgrounds we could easily get into the cities to see sights like the Hermitage in Leningrad, Peterhof, even the circus in Moscow. A highlight would be swimming in the Black Sea at Yalta.

In preparation for this plan, Rob took a course in Russian the previous spring, at BU. An engineer by training, he'd always struggled with learning a foreign language, so in an effort to help things along, I'd made him a set of flash cards of the Cyrillic alphabet. With some practice sessions, he'd be able to learn the phonetics of the characters, pronounce words, read road signs and learn some basic survival phrases. I don't remember how bad his failing grade in the course was, but the end result was, I learned Russian and Rob still could not communicate anything beyond "da" and "nyet." My own vocabulary was flimsy, but I could read a map, say "beer," and ask where the toilets were. This felt adequate at the time.

Our summer Russian adventure-to-be began with visiting old friends in England and then took us north into Scandinavia by a series of boats. The Kong Olav, a passenger ferry, was the most comfortable, with tiny overnight bunks. The boats got smaller and smaller as we advanced up the fjord-laced Norwegian coast, exclaiming at vast pine forests, snow capped peaks, and just the ruggedness of this



I stand in the doorway of our troll hut, an overnight stay on the way through Lappland.

Photo: Robert Wilhelm

remote land. There were stops overnight in youth hostels, a landing in a tiny port in the Lofotens, then finally an overnight small boat through a long strait to Narvik on the mainland. There was some seasickness involved; it was quite a rough overnight crossing. We found connecting trains through Sweden, swinging a bit further north to cross the Arctic circle and see the midnight sun, then south through Finland to Helsinki with overnights in more youth hostels.

Finally, the evening of departure on "the night train from Helsinki" arrived. The train was ominous looking, heavy Soviet style steel carriages with CCCP in large letters, along with a big red Russian Star, on the side of the carriage. We were ushered to separate compartments, men in this one, and women in that one; I got a top bunk (no ladder; good thing I was more agile in my youth) in a 4 sleeper, with 3 elderly ladies carrying a lumpy assortment of



I'm studying my Russian phrasebook before boarding the famous night train.
Photo: Robert Wilhelm

worn cloth bags, and who were speaking a Slavic language I didn't recognize. They giggled among themselves, mostly ignoring me. Evening began to fall and the light dimmed; the train chugged slowly out of the station. The one thin note of Russian hospitality after we were settled in our compartment was a uniformed Russian man knocking at our door and delivering 4 glasses of hot tea, the glasses contained in a silver filigree holder. This was such a surprising touch; I'd remembered my mother saying once, that her Russian Jewish neighbors in NYC always offered 'a glass of tea'. After sipping the tea, I curled up in my top bunk fully dressed and tried to sleep; I was exhausted and had no energy even to open my journal. We rattled on, through what appeared to be forests, in the dark and then suddenly, at some point in the wee hours, the train slowed to a halt and there was a sharp banging at our compartment door. I'd seen enough old war movies that I immediately pictured a jack-booted officer, banging with a rifle butt on the door, who would force us out to march for miles in the snow... but of course it was August.

It seemed we'd arrived at the Finnish/Russian border, and we were to 'declare our money'. I showed the officer my American dollars, whereupon he demanded "Uzzer money?" I pled that I had no other money, that I was showing all that I had. We'd been warned that smuggling currency into the USSR without declaring it, could land a traveler in very unpleasant circumstances. Like a Russian jail. Our passports were taken; my little Finnish pocket knife in its prettily decorated leather case, bought only to slice the tough Russian bread, was confiscated. A small piece of official paperwork was given me in exchange. The same happened to Rob, in a different compartment; they said our knives would be returned when we left the country but we figured we'd never see those knives again. (Fast forward to end of journey, same border crossing: we showed paperwork and our knives were returned to our great surprise.)

Morning dawned; we were discharged from the train into bright daylight. Rumpled and tired and hungry, we made our way to the Intourist hotel where we'd been assured our rental car, a new compact 'Moskvich' would be waiting, as well as our further directions to the campsite where we were to stay the first night. At the hotel desk, we met what was to be the first of many surly and sullen service employees.

"Vil-xhelm?" the woman spat out harshly, "there is NO Moskvich; there is Volga (she pronounced it 'Wolga'). We were shown the car, a heavy, boxy, black NYC-Checker-Cab lookalike with no frills whatever, and a license plate that clearly said, in white letters on black, TUR (for tourist) in Cyrillic characters. This tell-all plate would identify us to all citizens we met along the way to our destination, as 'foreign tourists'. It would lead to many adventures, some pleasant, some not-so. Rob had the brainstorm to spell out 'США' (standing for USA in Russian) in masking tape on the rear of the car and this little feature attracted much attention along our various stops. We were Americans, practically celebrities!

Earlier that summer we'd procured an itinerary through Intourist (the official USSR tourism agency), in a tiny office in Harvard Square, above the COOP. The itinerary had us starting in Leningrad (now St. Petersburg) with stops at 7 different campsites on a very specified route southward, including Moscow, Novgorod, Orël, Kharkov and Levshino, ending at Yalta on the Black Sea and returning via the same route. The map given to us loosely resembled a child's drawing, with no other roads shown than the sketchy one on which we'd travel. As we were to learn, this was a road to which we were seriously restricted, as foreign tourists. We took turns driving; at one of the many roundabouts early in our trip, Rob drove off on the wrong 'spoke' of the circle (remember, he couldn't read that Sebastopol was toward 12 o'clock, not 9 o'clock) and was immediately stopped and pulled over by a stern looking uniformed officer officiously waving a baton and demanding our papers. We were eventually ushered on to the correct road, but a tiny note of fear crept into us. We now were aware that we were being watched. This low level of fear remained with us throughout the month.

We were young, I was not quite 30 and Rob not quite 40, adventurous, wearing our broken-in hiking boots, and carried all our basic gear of cooking utensils, a tiny GAZ burner with fuel canisters for heating water, a sketchbook and paints for me, and as little clothing as we could manage. We'd also packed, on recommendation from the tourist literature, several cartons of cigarettes, chewing gum, and some cheap ball point pens, tokens to encourage or thank anyone we might feel would appreciate them. I took one worn copy of *Time* magazine as well, which proved to be a coveted item wherever it was spotted by a native. On the cover were George McGovern and Thomas Eagleton, both easily recognized by Russians as the Democratic nominees for the party's leadership in that fall's election. I finally gave it to one



Old style wooden church in the north of Russia.

Photo: Lucy Wilhelm



Our cabin in the Moscow campground; the summer was hot and very dry and many of the trees were dead or dying. Not a pretty setting at all. | Photo: Robert Wilhelm

persuasive guide, an intense young man who indicated that it was something he simply must own; I offered him gum instead but he brushed that off, clearly determined to get that magazine out of my hands. Rob's comment: "one copy of *Time* magazine is not going to turn the city of Kharkov into a hotbed of revolution"

Directions to the campsites, once we arrived in a specified city, were nearly nonexistent. Arriving to the outskirts of Moscow, we stopped and tried asking directions from a group of young uniformed soldiers at the roadside; there was much hand gesturing and bad Russian as Rob pointed to our wretched map and repeated 'camping' over and over; I tried forming the shape of a tent with my hands and indicated sleeping; finally after discussion among themselves, the three young men insisted on getting into the car and they would direct us. This turned out to be a complex, several mile winding route through highways and suburbs as they gestured 'turn here' and 'now turn there' but we were finally pointed to an entry to the campground. These generous young men would not take an offer of bus fare for their return but I was able to dispense a pack of cigarettes to each of them. We just assumed all Russians were smokers; they accepted politely.



One of many friendly campsite cats along the way. | Photo: Robert Wilhelm

The first campsite was a modest sized campground, with grassy meadows surrounded by nondescript trees, with a few dozen spaces for tents, a wooden barracks type building for showers and toilets (the latter being more primitive than you can even imagine) and common faucets for water scattered here and there. A series of large round very sturdy wooden picnic tables were spaced in between the sites. Most of them had carving, graffiti, and other 'artwork' etched into their well-worn surfaces. We pitched our tent the first night after giving up competing for use of the showers with a large busload of English young folks who were queued up for what seemed like hours. That same busload of Vikingtours Brits were to arrive just ahead of us for the next several campsites, always commandeering the showers and chattering loudly, singing and drinking until late at night. So much for the Russian experience.



Later, a Batik inspired from my sketches of St Basil's Cathedral in Red Square. | Artwork: Lucy Wilhelm

After that first campsite, our assigned spots turned out to be small cabins with squeaky beds—we never needed the tent again! This was a complete surprise but we accepted it as preferable to setting up the tent and sleeping on lumpy ground. In each of those little cabins were two cot beds, a nightstand with a cracked water pitcher, and a speaker mounted high on the wall—from which we never heard music or any announcements. We figured that the speakers were actually receivers, and they were ubiquitous in every cabin thereafter. A large Russian Ear must be listening to us.

One common feature of the campgrounds was the extended families of domestic cats that seemed to move comfortably among the people, accepting handouts and affection offered. There are many photos in our albums in which I am holding, feeding, or petting a tame resident cat. The cat-ness greatly added to my camping pleasure as I missed our pet cats at home immensely.

Part 2 to follow up from “From Leningrad to Yalta, in a Rented Volga”:

In which we discover the difficulty of actually buying food to eat; pick up an old babushka grandmother hitchhiker from a roadside, whose prophetic words forecast our future; discover some barely disguised Russian ‘helpers’ whose mission clearly was to shadow us; learn that a glass of good vodka aids the American traveler in speaking a foreign language much more fluently than could be expected, and are recited vast numbers of statistics of the height, width, age and brick content of so many Russian buildings, by bored guides; and finally dip our bodies in the Black Sea along with so many other visitors of varied ethnicities.

**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.

Retirement Journal— My Last MIT Commencement

Nancy DuVergne Smith

This excerpt comes from a book-length literary journalism work that documents the first year of retirement.

Over my 20-year MIT career, I've often attended Commencement, a joyous congregation of families, friends, and students awaiting degrees. Every June, this crowd of dressed up people remains remarkably cheery despite waiting hours in the sun or rain for their dear one to march. On June 8, 2018, I want to mingle one last time. Before 9:00 a.m., I walked down Memorial Drive along the Charles River and then through the white-tented security station, flashing my press pass for campus police. Once inside the courtyard, I scanned for picturesque families for social media photos. Snap! An Indian family in colorful fabrics. Snap! A bubbling brace of 20-something cousins waiting for their graduate to pass by. Snap! An Asian toddler with a miniature cap and gown waiting with daddy for her mother to march. Then I settled into a folding chair, one of about 10,000, to think a bit.

Commencement means beginning but at universities, it usually signals the end of classes and campus life. This sort of junction evokes both nostalgia and anticipation. For students, MIT's intensity, often called "drinking from the firehose," is now routine, so it's time to start fresh. Students may glance backward at triumphs and losses, but then forward, perhaps to launch something amazing. For faculty and staff, Commencement is more like a lap in a long race. Faculty pace their teaching material through the semester and, in the end, bid favorite students farewell and await the next batch. For alumni association staff like me, the cycle of life includes deadlines, meetings, and reunions. Each year, my work as editorial director ranged from finding interesting graduates to feature in the alumni magazine to managing our daily blog, *Slice of MIT*. My team and I wrote about research on quantum computing or alumni startups like producing a flying car. At MIT, there is always news.

This year is my commencement too. Although I have three more weeks until my retirement date, I am notching down the timeline. Never again will I have the option to call up an alum and freely ask questions about their life experiences. On the other hand, I won't be wrestling with daily deadlines and marketing goals. I will miss the daily writing and publishing as I move from a small role at a famous university to being the star of my own life. I can use "I" more boldly in my next act, as in "What do I want to do now?"

For today, I still have roles. I'm helping interview an alumna on camera for a future video. At noon my daughter Mei, 25, and I will join the Tech Day lunch crowd, and then we will walk over to the sports fields to judge haiku and limerick contests. By 5:00 p.m., we'll be home and



Sandy Island Point. A watercolor of a favorite spot on Lake Winnepesaukee.
Artwork: Nancy DuVergne Smith



Last MIT Commencement: Nancy DuVergne Smith at the 2018 event, three weeks before retiring.
Photo: Linda Rinearson

my life will change. My husband, Mark, and I will attend the Newton Art Association annual soiree with 50 or so fellow artists enjoying a catered dinner and an exhibition of our newest members' work. I wanted some work to hold on to, to allay my horror vacui, and here it is. During the evening, I will stand beside the current president and formally become the co-president. Snap! We are captured for the newsletter.

Back at Commencement, here comes the 50th reunion group, the Class of 1968. They are veterans of the MIT experience—many are successful beyond their youthful dreams. Now in their early 70s, they return to honor their MIT connection and their survival. A sea of white-haired men and a handful of women are positioned under the speckled shade of massive oak trees, standing out like cardinals in the snow in their long-awaited red jackets. The red jackets and the right to lead the academic procession into the courtyard are honors bestowed 50 years after graduation. These alumni nod to one another, smiling, and sharing old stories.

Through interviews over the years, one characteristic has stood out: alumni are grateful for their MIT experience. Before they arrived, many didn't know others with similar interests or they were nerds isolated by being the smartest person around. At MIT, they found their peers. MIT was never easy, but the rewards have been lifelong. At this moment, memories of the nights spent wrestling with problem sets have faded. Alumni sometimes say it takes 10 years to evolve from nausea to nostalgia. At this stage, they are also thankful for the people they love. That seems about right to me too. In an interview, a 90-something inventor told me the story of meeting the love of his life in his 30s but losing her to another man. In his early 80s, he began courting her when she became a widow. Now married a decade, he told me "I'm the luckiest man in the world." Now that's a love story!

Like this sea of graduates, I too, am on the verge of a new life. My MIT experience has been rich, but I have had other lives. Before universities, I worked for newspapers and magazines. I have traveled to 36 countries, crossed the Sahara Desert in decrepit European cars, and adopted a baby from China. When I was young, I didn't let fear stop me because I was more desperate for adventure than comfort. Now I am experiencing that Janus moment, part of me looks back, and part forward. Leaving the familiar is a bit sad, but I am excited to own my life in a new way. And I tend to be optimistic. Or maybe I'm just in denial. Earthquake or evolution—I will soon see.

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.

Remembering Tooele

David Kettner

This is a small series of "snapshots" about the town I grew up in during the 1940s and 1950s. They are a partial description of the setting that helped make me who I am today.

How do you get to MIT from somewhere in the Rocky Mountains? I was born in Tooele, Utah (pronounced “too-well-ah”), a town in the desert. It is about 30 miles southwest of Salt Lake City, and lies in a broad valley between two mountain ranges that lie north-south. The Salt Lake City valley is to the east over the Oquirrh Mountain Range, and the Great Salt Lake is to the north, about 20 miles distant. In the middle of the 20th century—about 1950—there were about 10,000 people in the town, so it was a small town, with a small town vibe to it. No one knows the origin of the name, though there are theories about it.

The town lies up against some foothills in the Oquirrh Mountains at an elevation of about 5,200 feet. On the south edge of town, near where I lived, there is a hill we called Little Mountain. For young kids, it was an easy hike up the side—the hill was rocky and covered in low weeds and sage. From the top we could look north toward the Great Salt Lake, and see what we called “the bench,” like a beach area, along the lower part of the Oquirrh Mountains, which was formed by the ancient Lake Bonneville, a part of the Pacific Ocean. As the land rose the Pacific was cut off, and the lake gradually contracted, due in part to evaporation. The salt concentration in the Great Salt Lake is much higher than that of the ocean. If we looked a bit toward the west of the lake, we could see the eastern edge of the Bonneville Salt Flats, where there were many attempts at land speed records by people in cars and on motorcycles. On our hikes to Little Mountain we would find sun-bleached snail shells lying about on the ground, and we told ourselves they came from the ocean.

There were two main industries in the town—the Tooele Ordnance Depot, an Army base, and the International Smelting and Refining Company, a subsidiary of the Anaconda Copper Company. My Dad worked at the latter. Most men worked at one or the other; in families with children, the mothers were usually at home. There were a few small ranches with cattle near the town, and much of the sagebrush around us was fenced in large sections for grazing cattle and sheep. There was some farming—e.g., wheat—but not much, because it was so dry.

When the Mormons settled the area in about 1850, they laid the town out in a north-south, east-west grid pattern. They made sure the main street, which ran north-south, was wide enough that a Conestoga wagon with a team of four horses could make a U-turn easily. It was four lanes wide, with space for angled parking on both sides.

Consequently, in the winter, the snow was piled up in the middle of the street rather than at the side. Though we weren't supposed to do it, going to and from school we would walk along the top of the snow pile, which was sometimes taller than we were.

The principal cross street, Vine Street, had a railroad track down the middle of it. A local train made three or four trips daily through town taking ore to the smelter, which was east of town. It was always exciting to see the steam engines chuffing through town, to hear the whistle and bell, and smell the coal-fired smoke. Since the train ran near the school, we would sometimes place a nail or bottle cap on the track for the train to crush. Today, the trains are gone, but one of the locomotives has found a home at a small museum in Boothbay, Maine, and another is at the Edaville Railroad in South Carver, Massachusetts.

When I was young, about eight years old, my Dad would take me on trips to the smelter on weekends. He was part of the management team, having started as a chemist in 1925. By the late 1940's he had been promoted to Superintendent of the concentrator, that portion of smelter operations that took raw ore delivered in railroad cars, and increased the percentage of the wanted metals—usually copper, lead, or zinc—in a sequence of grinding and flotation to separate out the unwanted material. The flotation process involved adding the powdery ore into a watery mix with special chemicals that carried the wanted metal off in a bubbly froth in huge mixers. The froth went into a dryer, which removed the water and made the concentrate ready to go to the furnaces for further refining. The process ran 24/7, all year.

My Dad would visit the smelter on weekends to check on operations to make sure there were no problems. We would start at the chemical lab, where he would talk with the people on duty and check on their analysis results on the stages of the concentrator processing, and then we walked uphill through the smelter plant, over railroad tracks, under trestles, watching out for trains moving about, and the like. It was an exciting trip for me, for I loved the sounds and smells—it was always an adventure, and sometimes we would stop at a different spot to watch the operation. At the concentrator building itself, at the end of a long flight of wooden stairs up the hillside and into his office, were new smells—cigar and cigarette smoke blended with the smells of the chemicals used in flotation, and the smell of sharpened pencils. The aromas were somewhat sharp, and pervasive. The noise in the concentrator was terrific—rock crushers, ball mills, rod mills, and the

noise of dozens of flotation cells, each with its own electric motor to stir the mixture. I was fascinated by all the huge machinery and loved it all.

Our house was not far from the center of town—the cross streets of Main and Vine. It was about 2 ½ blocks from our house, so it was an easy walk to the drugstore, the library, the Greek shoe repairman, the grocery store, the corner drugstore, and two movie theatres. The schools and an Olympic-sized indoor swimming pool were one or two blocks further down Vine Street. At about age 10 I mastered the bicycle, and the world opened up. The tracts of land around the town were fenced with barbed wire. There were dirt roads everywhere. My friends and I found our way into the nearby canyons, and onto the ordnance depot through a broken-down fence where we could crawl around in tanks and other equipment that was being dismantled. I was gone from the house for hours at a time. My mother never seemed to worry about where I was, and seldom asked. It was a safe place for kids to explore and roam. There were few cars on the paved roads, and none on the dirt ones.

One block south on our street, the road ran uphill toward the town cemetery (Little Mountain was behind that). In the winter the street was poorly plowed, and lots of snow was left behind, so kids from all over town would come with their sleds to slide down. The town put up barriers at the end of the street to keep out through traffic. We could spend hours on the hill in the winter.

Having sufficient water was always a priority for the town. Our water came from the nearby canyons and entered a water tank for the town. An irrigation ditch ran behind our lot, in an alley. It carried water from the upper canyons as well. Once a week the town turned water down it, and households could divert the entire stream into their yard for an hour. Lots of people had vegetable gardens because that was part of their food supply. We used the water on the strawberry plants in the back yard, and for Mom's flowers in the front yard. One of my chores was to block the user upstream from us, so the water could enter at our yard.

Tooele was a good place to grow up. It was small; we felt safe there, and we couldn't get lost by being far from home. The townspeople had lots of tolerance for goofy kids at play. Opportunities for getting into trouble seemed to be few, although there were a few juvenile delinquents. Economically, it was a fairly level field. No one was

particularly rich or poor, although it was clear that some families had more money than others. The Mormons were in the majority and occupied nearly every state and local government position, and ran the state. Their teaching made sure that kids respected their elders, and that carried over into the community. There was a certain pride in the community; people looked out for one another. Even though we were not Mormon, it didn't seem to be very important. In hindsight, the fact Mom became the state president of P.E.O. International would have been surprising, but she had good leadership and people skills, and so was accepted. Dad being elected to the city council is another example of acceptance. As for my friends, being Mormon or not wasn't important at all.

There were limitations: Almost no Blacks (despite the Army base, and Blacks could not join the Mormon Church, either), no Jews, very few Catholics, limited opportunity, and limited outlooks. The community was very white, very homogeneous. The world beyond town almost never broke into our lives; Sputnik is the most notable exception I can remember because I was interested in science. As school children, we never practiced the "duck and cover" maneuver like other kids. We may have been too sheltered, and the world around us was small and narrow. Consequently, I doubt many of us developed much in the way of "street smarts." We were all fairly naïve in the ways of the world—hicks, as it were—but it sufficed for the 1950s and the location in which we lived.

Now, how do I get to MIT from here?



About David Kettner

David Kettner is a graduate of MIT, having spent six years there, and a retiree of MIT Lincoln Laboratory, where he worked for almost 38 years. He retired in 2005, and lives in Massachusetts.



Approach to International Smelting and Refining Company, looking uphill. Oquirrh Mountain Range behind. | Image: Library of Congress

Training for Space Flight

Laurence Retman Young

Do You Want to Be an Astronaut?

If you ask almost any kid, “Do you want to be an astronaut?” the response is sure to be “You bet.” Well, me too—except that I wasn’t a kid anymore. By 1962 I was a junior faculty member in Aero-Astro at MIT and never far from the excitement of human space flight. I was a consultant to NASA’s Marshall Space Flight Center in Alabama. I had a research grant from NASA to look at how the Apollo spacecraft’s motion might interfere with an astronaut’s ability to hand control the launch of the Saturn rocket. Fortunately, a backup system was never needed. Several of my fellow graduate students, Buzz Aldrin and Ed Mitchell, Dave Scott, and Rusty Schweickart, flew on Apollo—and Phil Chapman was selected but didn’t get to orbit. Charlie Duke, who drove the Apollo rover on the moon with John Young, was my first graduate student. His master’s thesis was on the human role in lunar orbit rendezvous. Bob Parker, my Amherst fraternity brother, was selected as an astronaut scientist. So naturally, I was tempted to apply myself. But, with young children at home and a wife, Jody, who wouldn’t think of letting me take the risk (or of moving to Houston for that matter), my fantasy was put on hold. For 30 years. When the Space Shuttle was introduced in the 1980s, it promised to broaden the astronauts’ base to include working scientists. I saw another opening. NASA began recruiting and interviewing for the positions of Pilot, requiring extensive test pilot training and Mission Specialist (MS) aimed at practicing engineers, scientists, or physicians. And they introduced a new category of a non-NASA crew called Payload Specialists (PSs). The PSs would apply their specific expertise to performing the scientific payload experiments on a particular mission. PSs would be on loan to the space program. At first, they would come from the European Space Agency (ESA) and American universities and hospitals. They would work on orbit in the pressurized Spacelab (SL)—a school bus-sized lab carried in Shuttle’s cargo bay. The very first such PS, for Spacelab-1 (SL-1), was my Ph.D. student, Byron Lichtenberg. When the time came in 1990 for crew selection for Spacelab-Life Sciences 1 (SLS-2), I saw my last chance to fly myself. It would be my fourth mission as a Principal Investigator (PI), devising, and supervising experiments that would go into space to study human adaptation to weightlessness. So far, I’d done that from the ground.

Jody told me to go for it. And my three grown children, Eliot, Leslie, and Rob, all told me to give it a try. Well, if they weren’t worried, why should I be concerned? Except that I was 55 by then. To my surprise and delight, I passed through a series of tests and interviews. I was

named one of the three PS candidates for the Spacelab Life Sciences-2 mission to investigate a 14-day orbital flight's physiological effects. The expectation that two of us would fly as PS was reduced to just one when NASA selected Shannon Lucid, a Mission Specialist with degrees in biochemistry, to fill one of the seats. I had prepared for the scientific grilling in the interviews, but one astronaut friend on the selection committee later told me what sealed the deal with them was my experience as a ski patrolman. The committee apparently thought that demonstrated that I could keep cool and work as a team member under pressure!

So, I packed up the Texas-size Ford Crown Victoria handed down to me by my thoughtful mother-in-law Ruth and moved to Houston, just outside of the NASA Johnson Space Center (JSC). I began my two years of training as a PS (Payload Specialist).

Usually, when people learn that I trained for a space flight but never went into orbit, I am asked if I wasn't disappointed. Of course, I was. Who wouldn't be? But I still had an important job on the mission—one that NASA has considered its most successful.

In her marvelous autobiography, "Go for Orbit," my friend and Payload Commander, Rhea Seddon, wrote, "The difficulty with having three great candidates train with us was that we knew only one would fly. Some felt it cruel that we make them compete ..." But my experience was outstanding, and I wouldn't have traded it for anything. Nor was I surprised that my roommate, Marty Fettman, was chosen as the PS and that Jay Buckey and I were designated as APSs (Alternate Payload Specialists). Jay later flew as a PS on the Neurolab Spacelab Mission and had a successful academic clinical career at Dartmouth. Marty was a skilled veterinarian at Colorado State. I was a novice at the precise dissection of rats, which would need to be done on board. The rats were comfortable on Marty's arm—but they bit me. Marty would fit all of the astronaut criteria.

My assignment was as a backup astronaut—fully trained and ready to be launched if anything prevented Marty or possibly one of the MSs (Rhea Seddon, Shannon Lucid, or Dave Wolf), from flying. Jay and I were also the Payload Communicators. For all of the simulations and for the 14-day flight itself, we were the principal interface between the Payload Operations Control Center (POCC) and the flight crew. We were thoroughly familiar with the payload and its constraints—

so the crew was at ease discussing payload problems with us over the Air-to-Ground (AG) radio loops. The Payload Operation Control Center (POCC) was at the Johnson Space Center in Houston for the simulations and in Huntsville, Alabama, for the flight. We were very much part of the crew. We had the same training and were entirely capable of following the checklists for all of the nominal (regular) and the “off-nominal” experiment procedures and repairs.

We went through all of the Shuttle operations and procedures—including all of the safety drills. We were exposed to the g-forces of a launch and fitted for our Launch and Entry Suits (LES) for the eight-minute centrifuge exposure at Brooks Air Force Base in San Antonio. Our “Water Survival Week” included parachuting into Pensacola Bay. At the Kennedy Space Center (KSC) in Cape Canaveral, we learned to drive the armored personnel vehicle (APV) to escape from the safety bunker in the event of a shuttle explosion at the launch pad. We put out fires. We participated in press conferences, invited our families and friends to the pre-launch party at KSC, stayed in the Crew Quarters at “the Cape,” and dressed in the official crew rugby shirts for the flight—just as the flight crew did. During the 14-day flight, Jay and I shared the APS communication duties. I remained in regular communication with the PIs on the mission—offline—and was pleased to be part of an important scientific campaign.

My relations with the Deputy Mission Director had been frosty since my earliest contretemps over permission to fly back to Massachusetts for my children’s weddings. She ran the mission and the POCC professionally and effectively—with no-nonsense. I was relieved that she at least allowed me to position my MIT coffee mug in the camera view of NASA TV, which was broadcast around the world.

During the 14-day mission of SLS-2, my role as the Payload Communicator, which I shared with Jay, kept me fully involved in the experiments my buddies were doing in space. The only times I felt jealous occurred during the quiet pre-dawn hours before the crew went to work. During training at JSC, I spent many hours looking through the Earth Observation photos and their interpretations, and learning how to use the Hasselblad camera to take my own shots. Now the live TV images of the Earth, taken from the Shuttle, made me wish I were in orbit.



Larry Young, Rhea Seddon, and Dave Wolf at the Shuttle entry level of the Launch Pad.

I never had a dull moment during the two years of training. We began working with the General Electric mission management team, off-campus. I was surrounded by contractor engineers who regularly went home at 4 PM. I felt rather removed from the real NASA activity. After a while, we were moved into the astronaut offices on the top floor of Building Four at JSC—and only then did I really feel part of the space team. As PSs, we were at the bottom of the astronaut pecking order—

but on the other hand, we were recognized as part of the team and assigned to a mission. Some of the older astronauts, with whom I had worked since 1980, were especially helpful. They even encouraged me to sit with them in their undesignated but well-established corner of the JSC cafeteria.

Our Crew

The scheduled 14-day flight would be the longest to date and carry a crew of seven. The flying duties were shared between our Commander, John Blaha, and our Pilot (really co-pilot), Rick Searfoss, who had been first in his class at the AF Academy.

Our Payload Commander, Rhea Seddon, was my “Boss” for the mission—and that’s what I called her, except when NASA was monitoring us. She was a level-headed MD who spanned the gulf between space flight requirements and the scientists’ needs. She was my friend and supporter throughout this adventure. Rhea was married to fellow astronaut Hoot Gibson, later head of the astronaut office. SLS-2 was her third and final mission.

As Rhea repeatedly pointed out, our real commander was AF Colonel John Blaha, on his third space flight. John was a Colonel in the USAF and was proactive in forming a crew team and maintaining crew spirit. He made sure of the little things that made me feel part of the crew—like inclusion in crew photos and the printing of my astronaut picture. I was tickled to respond to requests for autographed photos. He arranged for Marty, Jay, and me to use the Astronaut Gym and to attend the Monday morning astronaut briefings when John Young went over all of the technical issues for each flight. And he made sure that we were included in all of the crew activities at KSC, including stays at the well-equipped crew quarters and the astronaut beach house.

A veteran of 361 combat missions and a research flight to over 120,000 feet, John was the ideal leader of our group. During the simulations, when cascading problems were thrown at the crew, he could calmly prioritize them and assign responsibilities. He assured me that in-flight things never got that bad—and they didn’t. He respected all of our interests. He told us that, no matter how much the crew enjoyed the flight, it would be a failure if we didn’t accomplish the scientific goals.

In addition to Marty, the PS, we had four MSs on board. On his first Shuttle flight, Dave Wolff was an engineer and physician from NASA, who had been involved in the development of the Bioreactor and the flight echocardiogram equipment we used in Spacelab. An outgoing and fun-loving astronaut, 20 years my junior, he took me on as a surrogate for his uncle, who had so influenced his career. Bill MacArthur was a brilliant engineer and career army officer, also on his first flight. Shannon Lucid was harder to get to know. She seemed more concerned with establishing her broader role as a female astronaut who was a pilot than in meeting our science objectives. Shannon went on to fly on MIR and, at that time, became the longest flying US astronaut.

Shuttle Training

After a year or so of Space Shuttle Training, Jay and I were interviewed by the JSC newspaper about our backgrounds and experiences in training. I compared myself to Indiana Jones, a movie hero who was also a college professor and pursued adventure in the name of science. His passion was archeology; mine was space physiology. I knew that life as an astronaut would entail more risks than teaching in Cambridge, but I was more than ready to jump in—even at my advanced age of 55. My crewmates were all in their thirties.

Although most of the Shuttle training was intense—it wasn't really difficult. The Shuttle classes were adequate yet perfunctory. The practice sessions in the simulators were effective. And yet we knew that we were being observed and "scored" at almost everything. The mental demands were far less than graduate school, and the physical demands were trivial. I found that, despite my age, I could absorb all of the procedures of both the Shuttle and Spacelab operations. I began practicing procedures in my mind by "visualizing" each step—which switch needed to be thrown or which cord needed to be pulled to release oxygen or deploy the parachute. And then there were days of what Jay called "FGE"—or Fun at Government Expense. We each had an assigned "Scheduler" who would fill out our hour-by-hour program for each week and manage to somehow fit in all of the training requirements and, where possible, to comply with our requests, including a few hours each week in the gym.

Centrifuges and Water Survival

Much of our Shuttle training was away from Houston. Water Survival Training was conducted by the Navy in Pensacola, Florida. To improve chances for survival, in the event of a bail-out from the Shuttle or the T-38 ferrying us from Houston to the Cape, we all went through the standard Navy training week. We learned to “drown proof” ourselves by making our pant legs serve as balloons and to maneuver our way safely out of an inverted, upside down, helicopter—underwater. We dropped into Pensacola Bay by para-sail in mid-winter and then climbed into an inflated one-man life raft. For the “group rescue” exercise, I volunteered to be the navigation officer. I was sure I could handle the job since we would never be more than 100 yards off the beach! Back at JSC, I was checked out for SCUBA diving and would sign on as an observer. I watched Story Musgrave and my close friend Jeff Hoffman, as they practiced the intricately choreographed steps which they were to employ during their EVA in space to put the Hubble Space Telescope in working order.

To accustom ourselves to the g-forces of the Shuttle launch and to verify the fit of our launch and Entry Suit, we rode the centrifuge at Brooks AFB in San Antonio. Bill MacArthur was pleased to be our Army helicopter pilot for the trip. The centrifuge exposure mimicked the Shuttle launch—with a maximum of 3 g’s during the eight-minute ride. That was easy. Of course, I experimented on myself by making some head movements during the rotation, producing the expected disorientation illusions and some slight nausea. On days like that, my training felt like a trip to Disneyland—without the crowds.

Unlike JSC, where astronauts were commonly seen, we were figures of interest at the Cape. It took me only a short time to learn that “The Cape” meant Canaveral and not Cod. When we were wearing our blue flight suits, we got used to people looking at us—both NASA and outsiders. Our trips to KSC allowed us to see and touch our own Shuttle. With the Columbia on the launch pad, we took the elevator way up the gantry and entered the Shuttle from the “White Room.” Inspecting the real thing on the flight deck and down below in the “mid-deck” was a thrill. I biked around Merritt Island, swam in the ocean and enjoyed the solitude of the Beach House. Some days I rented a windsurfer on the nearby Indian River. On one trip, shortly before launch, I was the only crew member free to ride on the Transporter, for the first part of its all-night slow trip from the VAB (Vertical Assembly Building) out to our launch pad. The trip was made

at night to minimize the likelihood of damaging winds. Even though I had nothing to do except represent the crew, that ride was a thrill.

Flying—but not on the Shuttle

In addition to training on the Spacelab life science experiments and Shuttle operations, NASA scheduled several familiarization activities. John took me flying in the NASAT-38 jet trainer for the “dollar ride” afforded all new crew. I was seated in the back seat behind John and marveled at southern Texas’s sights, as John flew us from Ellington Field, near JSC, out to our assigned maneuvering space over the Gulf of Mexico. And then I was given control of the plane. John, of course, could take over at any moment. We broke the sound barrier and made several gentle maneuvers. John would instruct me to establish a desired heading and altitude. I wasn’t very adept at the task and wandered back and forth around the assigned compass heading. Then, John suggested that, instead of looking at the instruments, I might try looking out the window. Suddenly, on that blue-sky day with a clear horizon in view, everything became much easier. On another day, just for fun, Dave Wolff took me up in his little plane to show me the acrobatic maneuvers which he performed during competitions. That was illuminating—but once was enough!

The astronauts were also able to use NASA’s new Gulfstream which was acquired, supposedly, to allow Mission Specialists to maintain their piloting abilities. It was used whenever a good excuse could be found. We flew in it from JSC to KSC. And we flew to North Carolina for the funeral of Bill’s mother. Nothing wrong with that. I was interested in the steep approach of the Shuttle for its landing in Florida so I was allowed to sit in NASA’s modified Gulfstream’s cockpit while Rick practiced the 28-degree approaches to the landing strip at KSC. It looked and felt like falling out of the sky each time.

Even before I began any astronaut training, I flew on numerous parabolic flights. After each 2-g pullout they followed a zero-g path for about 20 seconds, allowing us to practice some of our experiments in weightlessness. And to have a lot of fun as well. The parabolic flights played an important part in the development of equipment and procedures for our Spacelab experiments. Chuck Oman, Bob Renshaw and I from MIT, Doug Watt from McGill, and Ken Money from Toronto all accumulated a lot of time in weightlessness—20 seconds at a time. I always enjoyed the chance to observe my own spatial orientation when moving around in a Zero-G parabola.

I would avoid motion sickness on the “Vomit Comet,” by limiting my head movements during the 2-G pullout phases separating each of the 40 or so free fall periods. I also took the medication “Scope-Dex” (Scopolamine-Dexamphetamine) before takeoff. For one of the flights during our crew training I decided to evaluate my reaction to the in-flight medication being prescribed for astronauts. The intramuscular injection of promethazine was supposed to eliminate motion sickness symptoms, although it might bring on side effects, including drowsiness. I told the on-board flight surgeon that I intended to produce symptoms by making head movements during the early parabolas and then to have him inject the larger than usual 50 mg dose of promethazine in my arm. And so, we did. I made head movements, got nauseated almost to the point of vomiting, and he gave me an injection. So far so good. Except that the symptoms didn’t really disappear. An hour later, after landing back at Ellington I could barely find my car—and driving the five miles back to home was like trying to drive after a week without sleep. Fortunately, I made it, and crawled into bed—dead to the world for the rest of the day. And convinced me that I would avoid that drug—at least in that dosage—if I ever got space sickness.

Payload Training

The payload training, as opposed to the Shuttle training, was intense, fascinating, and right up my alley. We spent time with each of the PIs in their home laboratories or in Houston and received hands-on instruction from world-class scientists. We understood the scientific approaches as well as the operation of the facilities—and how to fix them, following a set of MALFS (Malfunction Procedures). After the introductory tutorials we were individually coached by the very capable and always supportive GE payload training team. We practiced on the wide range of human and rat studies to answer questions like, bone loss, muscle deconditioning and cardiovascular or respiratory regulation in weightlessness. I was especially pleased to observe the crew’s acceptance of our on-board computer assistant—“PI in a Box”—which I had invented to assist the astronauts on board.

I remained the PI on the extensive set of human vestibular experiments, including the “rotating dome” to assess the way weightlessness altered the vestibular reflexes and spatial orientation. But I left all of the training for the baseline pre- and post-flight testing to my Deputy PI and former student, Dan Merfeld—who performed

faultlessly. Dan was a recent PhD of mine, who went on to be a professor at Harvard and then at Ohio State, specializing in the vestibular system.

Some of the training was hard—and I don't mean physically demanding. For me, the most difficult procedure involved inserting a catheter into a tiny blood vessel in the tail of a rat. It was used to draw blood and insert a radioactive tracer for calcium turnover studies. Since this was done with our hands in surgical gloves, with arms inserted into isolated reduced pressure "glove box," it took all my marbles to avoid puncturing the vessel wall. (It was much easier to insert a catheter into a vein of one of GE's patient volunteer trainers.)

First of all, the rats and I didn't get along. They seemed to sense that I was nervous around them and I had trouble grabbing one, first to inject a small catheter into the tail vein and then to sacrifice it in the guillotine. (No wonder they were nervous.) One time I was bitten and was sent to see Dr. Richard Jennings, our flight surgeon at JSC. He had not dealt with rat bites before and together we looked up the treatment. It was nothing special—but from then on, I wore reinforced leather gloves. Once the animal was sacrificed, we had only a few minutes to complete the dissection before the samples would begin to deteriorate. Starting with the identification and removal of the vestibular organs in the inner ear, we proceeded to dissect all of the organs for study by the PI teams. My inability to do that rapidly and precisely may have been my major shortcoming in the final PS selection process. I couldn't disagree with the PI's and Mission Director's decision to select Marty for the job in space.

I also needed a lot of guided practice to manipulate the probe of our ultrasound imager to be able to get good echocardiogram images of the beating heart—all four chambers and the valves. It was always a thrill to "look around" with the probe and suddenly see the beating heart—either my own or one of the trainers.

Living in Texas

The apartment that I shared with Marty was only a mile from our offices and overlooked Egret Bay—an offshoot of Clear Lake. My bedroom had sliding doors opening onto a deck just one floor above the dock. There I kept not only my wind surfer and my kayak, but also the small sloop belonging to my friend Drew Gaffney. Drew was a

physician and cardiovascular researcher who flew as a PS on SLS-1 and stayed on in Houston afterwards. I taught him to sail better and he later altered his life to live on his (bigger) boat in New Zealand. If there was a good breeze, I would wind surf around Clear Lake after work. If not, I would kayak into the quiet waters off the main lake and commune with nature and particularly the egrets and herons. We had an outdoor pool and a tennis court in our apartment complex. I belonged to a tennis club across the bridge in League City. In Clear Lake or Nassau Bay, I played tennis with a number of my astronaut friends and enjoyed their camaraderie. Marc Garneau was a Canadian astronaut who later became head of the Canadian Space Agency and then a government minister. Claude Nicollier was a Swiss astronaut who had been a friend of mine since his earliest days as a European PS for Spacelab and then flew as a NASA MS. Wubbo Ockels, a Dutch Payload Specialist and dear friend, had been an APS on Spacelab 1, and later was one of my space subjects on the German D-1 mission. He taught me a lot about wind surfing as did Jeff Hoffman, another astronaut, and a friend since his MIT post-doc days. He later became a colleague on the MIT faculty. I biked too, mostly on weekends because of the traffic. Life was good in Houston—except for the damned heat and humidity.

Fly as you Train—Train as you Fly

Most evenings in Houston were spent studying. The training material wasn't hard—but there was a lot of it. I dropped the multitude of academic activities like advising and serving on committees, and thereby found enough time for the training. The first year or so involved familiarization with the scientific rationale and especially the operation of all the life science experiments. Even though I had taught the subject, I learned much more about the effects of weightlessness on the human body. We spent several days at the home laboratories of many of the two dozen PIs. This included my own lab, MIT's Man-Vehicle Laboratory. My long-term friend, former student and colleague, Chuck Oman, took over as Director of our Man-Vehicle Lab and led it following my return. The Spacelab research covered all of the gravity sensitive systems of the human body—as well as the corresponding organs in the 24 rats who also flew on the mission. Gravity, or its absence, weakened bones and muscles. It affected respiration and blood cell formation, and influenced the immune system and metabolism as well as the vestibular system, my own special interest. The flight equipment was all specially designed to

work in microgravity. The mass spectrometer analyzed gas exchange in the lung while an astronaut exercised on a bicycle ergometer. My own “rotating dome” device induced tilt by rotation of the visual surround. Almost everything else was new for me—and we all had the privilege of being mentored by some of the world’s leading experts—the PIs and their assistants. Beyond the payload science was the technical operation training. We learned how to identify malfunctions in the equipment and, where possible, to follow the detailed malfunction procedures.

Learning How to Live on the Space Shuttle

Beyond our training on the experiment facilities and operation lay the required familiarization with the Space Shuttle systems. These were similar to the training given the astronaut candidates (ASCANS) but much less intense. We learned how to deal with cabin depressurization and other emergencies. Life on the Shuttle entailed preparation of meals, and of course the use of the vacuum systems for disposal of liquid and solid human waste. For voice communication we carried our radios and learned how to safely recharge their lithium batteries. We were shown how to set up and operate the ShuttleTV cameras. We were even given a lesson on the Shuttle Guidance and Navigation computers, although it was highly unlikely that a PS would ever be called upon to touch, let alone to operate any such critical device. In the Shuttle mockup at JSC, we practiced bailing out of the Shuttle by dropping onto a slide. That was much like the commercial airplane evacuation slide we all had seen demonstrated—with one exception. We dropped onto the slide still wearing our parachutes and stepping free of cables, which tended to roll us over sideways. In fact, Rhea broke her leg during one of the sessions and bravely limped around in her cast for a while, but managed to carry on as a key crew member. During our water survival training we practiced handling our parachute and raft for recovery—both in the JSC pool and in the chilly Gulf water in Pensacola. Some of our training was conducted at KSC. One day we took the launch site elevator up to the level of the Space Shuttle entry hatch and we proceeded to familiarize ourselves with “Our Space Vehicle.” There was a special thrill in sitting in the crew seats some of us would occupy during the real mission. Then we learned how to get out of the Shuttle. In the event of a pre-launch fire we learned how to control the temperature and breathing supply on our pressurized orange Launch and Entry suits. Most of the Shuttle training involved study of a manual and then demonstration of

mastery of the procedure in a simulator in the training facility at JSC—always under the watchful eye of a trainer who would notice, and report, any mistakes. I typically spent the night before each run-though visualizing the procedure. With my eyes closed I would imagine the scene and then visualize each action I would take, from flipping a switch to pulling the cord to inflate my parachute. It worked pretty well. When I returned to ski racing later, I applied the same techniques to visualizing and then performing a slalom training run.

Physical Demands of Training

Before starting training, I was afraid that I would be too old, at 55, to accomplish all that would be required. The rest of the crew were all in their thirties. In fact, there were only two exercises in crew training that required my maximum physical effort. One was practicing an emergency egress from the cockpit of the Shuttle mockup if the main hatch could not be opened from inside. (Shades of the Apollo 1 Shuttle fire.) In your LES you were supposed to climb up on a seat back and chin up to the overhead window to escape. That was hard but I managed it. The other case was in the old swimming pool at JSC, once again dressed in a LES. You were supposed to climb into your inflated one-man life raft. Most of the time I tried, it flipped over on me.

I made substantial use of the astronaut gym—once John had convinced management to allow PSs to cross that threshold. By informing my Scheduler of my desires, I would be put down for a couple of hours there several times a week. Sometimes I shot baskets but mostly I just rode the stationary bike. I felt “cool,” dressed in the NASA exercise shirt and shorts. The gym gave me the chance to talk to some of the astronauts about their experience and to benefit from their advice. Charlie Bolden, who had been the Pilot on one of our earlier Spacelab missions, was especially friendly and helpful. I was delighted years later when he was selected to serve as NASA’s Administrator.

Non-Training Pastimes

The two years included many non-NASA adventures. I biked or played tennis almost every weekend and paddled down the beautiful Guadalupe River on a JSC outing. I was welcomed as crew on a sailboat that raced on Clear Lake—but the winds were too light and sitting on the gunnels all afternoon was too uncomfortable to make

that very much fun. One weekend I crewed on a small sloop that, amazingly, won its regatta in Houston.

I managed to get together with Jody about every other weekend—either in Texas or back up north in Massachusetts or NH. Her visits usually involved a trip to see birds. Sometimes it was in Galveston or nearby at High Island, where the exhausted flock finally set down and nested after their long flight across the Gulf of Mexico. Other times it might be in East Texas—which reminded me of the dying town in “The Last Picture Show.” Probably our best trip—for birding and scenery—was all the way west to Big Bend National Park, an amazing oasis of flora and fauna raised hundreds of feet above the desert. There was always something to do with her and I regretted the Sunday night separations for another fortnight.

As time went on, I got to appreciate some aspects of Houston itself. I took country dancing lessons at JSC every Monday night. I would forget the steps by the weekend and relearn them the next Monday. Jeff Hoffman sometimes had extra tickets to the Houston opera and I went along. Other times I would go to hear the outstanding Houston Symphony, directed by Christopher Eschenbach. But most of all, I grew to appreciate the genuine friendliness and helpfulness of the average Houstonian I would run into—at least down near NASA in Clear Lake City. I received more than the fabled “southern hospitality.” They were certainly not rednecks—even if they did say they were “fixin’ to” do something and then did not get around to it.

Houston—“No Problem”

The mission itself was a great success. The scientific return was enormous, and the contributions of Payload Specialists were highly regarded. Although I would not return to Houston full time, I did later serve as the Founding Director of the National Space Biomedical Research Institute. Our headquarters were in Houston at the Baylor College of Medicine. Late in my career, I served as Head of Science Education at the Houston based Translational Research Institute for Space Health. I have fond memories of Houston. Everything except the heat!

All in all, the two years in Payload Specialist training were highlights of my life. I am grateful to everyone who made them possible, from my NASA crew mates to MIT for giving me the time away, and to my supportive and loving family.

And Still a Space Cadet

After a career of contributing to human space exploration, I still remain enthusiastic. Here I am, standing in front of a student prank mockup of the Lunar Excursion Module, trying to hitch a ride to space with Neil Armstrong and Buzz Aldrin—from MIT's Kresge Lawn.

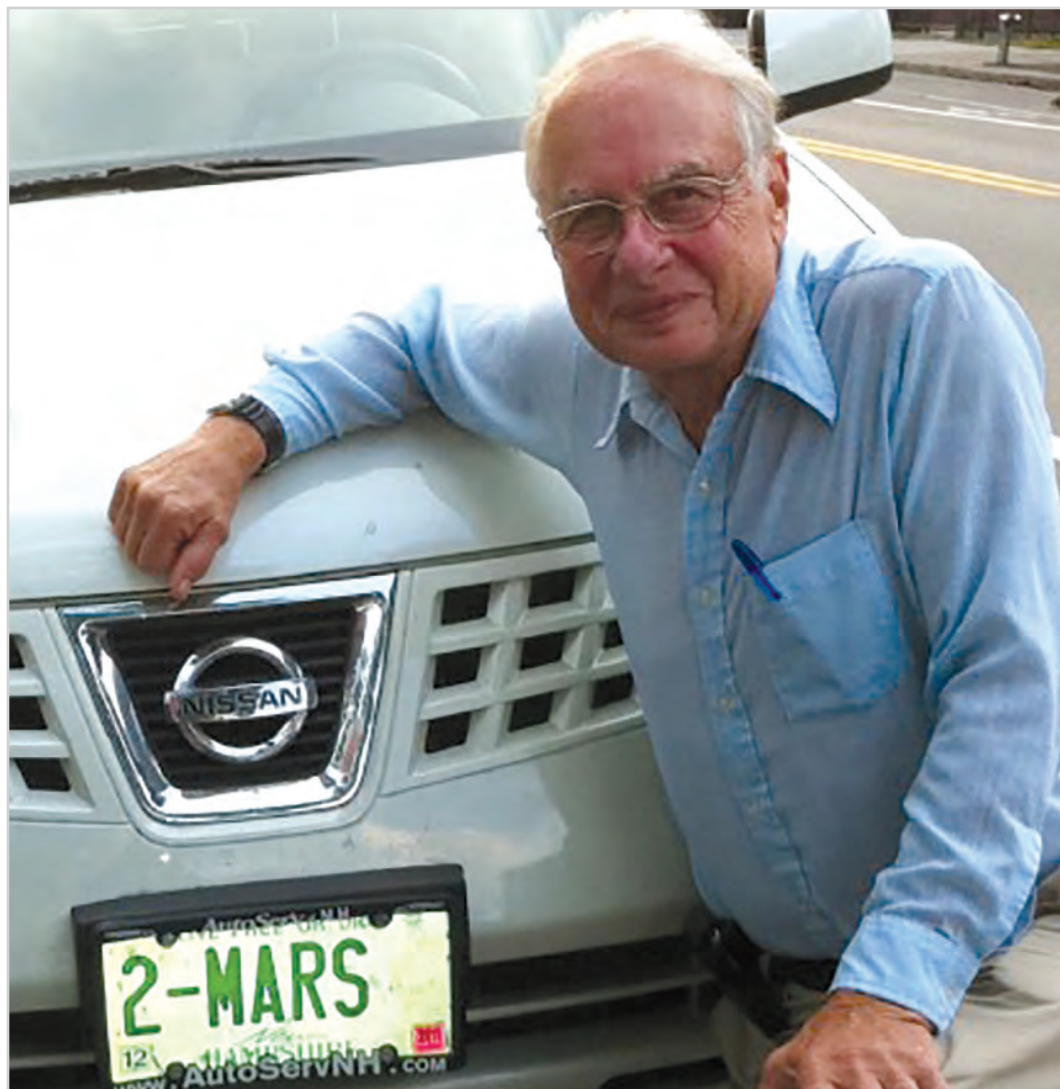


The Apollo 11 moon walkers, Neil Armstrong (left) and Buzz Aldrin, ScD '63 (center) in front of a student mockup of their Lunar Module on the Kresge Lawn at MIT in 2009, along with Larry Young, SB '57, SM '59, ScD '62 (right) trying to hitch a ride to space.

Photo: Sheila Widnall SB '60, SM '61, ScD '64

And how about the future?

I believe that we will see people explore Mars in the next couple of decades. My NH license plate expresses my commitment to going “2-Mars.” On the other hand—this is now my third car to carry the plate—yet I remain hopeful.



Larry Young's career has changed over the years, but his faith in human exploration of space remains evident on his license plate. | Photo: John Charles

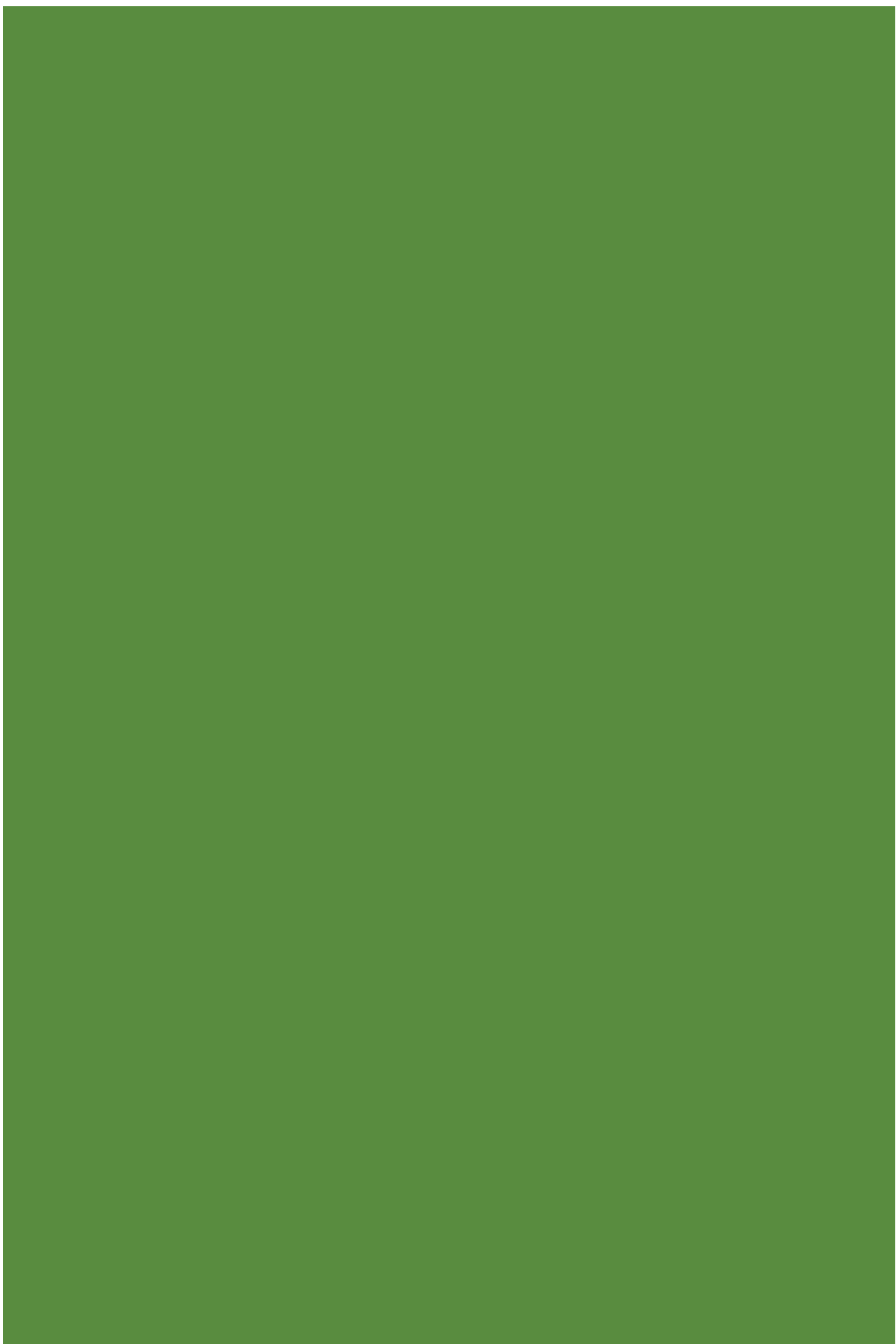
Coming Up Next

In the chaotic 2020 election season, we might all consider why we vote a certain way. For his next contribution, Larry Young examines his own political trajectory in “How I Became A Liberal.”



About Larry Young

Larry Young is 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. He remains 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.





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Sandy Island Point
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