Finding My Profession (1965)

It was a warm, sunny, August afternoon as I walked across the University of Washington (UW) campus in Seattle. Mt. Rainier stood out boldly in the distance. The year was 1965 and I was about to enter my senior year. I was beginning to wonder what I would do when I graduated. What kinds of jobs were available for someone graduating with a Bachelor of Science in Mathematics?

Math had always come easily to me. In my fourth and fifth grades, I had had the good fortune of attending the Payne Training Grade School associated with Arizona State in Tempe, Arizona. In this progressive school, the students were encouraged and allowed to learn at their own rate. When we were ready to be tested on our assignments, our spelling words or our multiplication tables, we raised our hand and one of the many student teachers came over and tested us individually. When we successfully passed the test for one level we could get the sheet to study for the next level. The mimeographed sheets of paper with the times tables were located in the cabinet at the edge of the room. I remember one whispered conversation at the cabinet.

"I'm on my sixes, what are you on?"

"I'm on my sevens!"

We had a friendly competition to learn them all. I remember one day when a classmate was having trouble with her assignment. She was upset and crying. I sat with her and calmed her while explaining how that level of multiplication worked.

So it was not surprising that in high school, looking ahead to college, I had decided to become a math teacher. But my father and my high school math teacher coached me, both recommending that I major in math and minor in education instead of majoring in education. They said that I would have more opportunities with a degree in math.

Growing up, my father was in the US Army and we moved every few years, but we lived in one place for my last three years of high school: El Paso, Texas. As I graduated my father was going on an overseas assignment, while my mother and younger siblings—I was one of six children—stayed in El Paso until his return. If there was anyplace we called home it was Seattle, Washington, where both my parents grew up. When I looked around to choose a university I was strongly influenced by the fact that I qualified for Washington in-state tuition—because of my father's retained residency—and by the invitation from my aunt and uncle to live in their home. My older brother, John, accepted a similar invitation the previous year and he was living with them while studying electrical engineering. Thus I found my way to the Department of Mathematics at the University of Washington, arriving in time for the 1962 Seattle Worlds Fair.

During my first three years, I was engrossed with my math classes and delayed taking the education courses. Looking at the catalog of available classes each quarter I always favored the math classes over the education classes, anyway. But this brought up the question: If I wasn't going to be a math teacher, what was I going to be?

Seeking the answer, I headed to the School of Business in Mackenzie Hall that August day. There were two placement offices on UW campus: one located on the lower campus for the engineering students and one located in the School of Business. When I inquired at the engineering placement office, I was told that recruiters would visit the campus in the spring but they could not tell me anything now about job opportunities. So I decided to try the placement office

in the School of Business. When I arrived, I told them I was looking to see what job opportunities were available to someone graduating with a degree in math. The woman behind the counter became very animated and told me there was a professor looking for someone to work for him, and that I had the exact qualifications he was looking for. I told her that I already had a part-time job and that I was looking for job opportunities when I graduated.

But she insisted, "Go upstairs and talk with him. Right now."

Upstairs, at the end of the long hall, I turned left and found Professor William F. Sharpe, a bespectacled man in his early thirties with sandy brown hair, sitting in his office. The room was small with a messy desk on the left and a large blackboard on the wall to the right. Straight ahead, next to the window, was a guest chair. Dr. Sharpe, I learned, was a professor of economics in the Business School. With animation he outlined his plans to teach his business students about the capabilities and limitations of computers. At the time, all the computers were located in a building on the southern part of the campus near the engineering departments, which was about half a mile away. Dr. Sharpe wanted his business students to have the convenience of turning in their computer programs and picking up their output in the business school building, at the north edge of campus. He was opening a small office and he needed someone to manage it. In addition, he was looking for someone to write some programs for other business school professors. Did I want the job? Starting now?

I was not too interested—after all, I already had a part-time job—but I told him I would think about it.

While I was at the university I lived with my Aunt Lois, Uncle Lee, and my older brother, John, a couple of miles northeast of the university. That evening I shared the story of my day with them over dinner. I related it as an interesting experience but I was still focused

on what I would do after graduation and not thinking about changing jobs.

For the past year I had been working twenty hours a week doing statistical calculations for a research project at Providence Hospital. Scientists there were conducting early research into finding a heart replacement valve. Pages and pages of handwritten data documented the chemical components of blood samples taken during surgery and they wanted to know if there was a correlation between different components in the blood and body temperature. I used a mechanical calculator and entered the data, by hand, to perform the statistical calculations. Earlier that week I had spoken with my boss at the hospital, someone I rarely saw.

"I've been here a year and I don't have any correlations to report," I told him.

"These things take time, it's the nature of research. Don't be discouraged," he replied, assuring me that he was pleased with my work.

As I left the meeting I thought to myself, "If that's what research is like, then I'm not too interested. I like the satisfaction of getting results."

Slowly during the dinner discussion with my aunt, uncle, and John, I changed my focus from the future to considering this current opportunity with Dr. Sharpe. I reflected on the tedious work at the hospital doing statistical calculations with little results. And I liked the idea of working on campus since my current job required me to take two buses and transfer, often in the rain. By the next morning I had decided to take the job.

That is how I started to work for Dr. Sharpe and the business students. I kept the School of Business remote computer office open as the students came by to use the keypunch machine and drop off their stacks of computer cards. Some students were learning to write BASIC[1]

computer programs, and they keypunched each instruction into an IBM card. Other students were taking a class that used the computer to simulate a competitive business environment. These students were divided into teams and each team represented a different imaginary company. The teams made decisions about how much to spend in various areas of their business (research, manufacturing, infrastructure, advertising). These numbers were keypunched into computer cards to be used as input to the simulation program. The program then printed out the results of how their company did in the competitive business environment with the other teams. But first, all the cards needed to be taken to the computer center where they were the "input" to the simulation program running on the computer.

Another student worked as the courier but occasionally I took the programs down to the main computing facility. Here, I walked into a room with keypunch machines lining each wall. At the counter I dropped off my batches of already keypunched cards. Behind the counter I looked through a window into the large room with raised floors. Big grey computers, looking like tall cabinets, stood in rows down the middle of the room. Along the left wall were more tall cabinets with spinning reels of magnetic tape. Hidden under the raised floors were large black cables that connected the different computer cabinets. I learned that the computer room was always air-conditioned because of the heat given off by the electronic machines.

I walked over to the "output" section, which was a wall of pigeonhole boxes. Here I picked up the results of the computer runs to take back to the School of Business remote computer office. A rubber band strapped a computer listing around each original stack of cards. The computer listing consisted of lined, legal-sized, fan-fold[2] computer paper with a printout of the program showing either the successful results or a list of errors.

The previous school year I had taken a computer class offered by the

math department and I found it very dull and uninteresting. Focused so much on the internal addressing mechanism of computers, this class was a little like studying the wiring diagram for a car but never getting the overall picture of a car and its capabilities. There was no computer science department at the university in 1965, only a scattering of computer-related classes in the engineering and math departments.

It was around this time that my father recommended that I consider becoming a computer programmer. He said it was probably a good career for women because it was a brand new field. I told him I wasn't interested. I could not see much to recommend those big grey cabinets inside the air-conditioned room with the raised floors.

Then one day a business student came by to pick up his computer listing and he expressed disappointment because it did not work as he expected. There was some kind of error and he did not know what was wrong. I looked at the listing and I could see the error immediately. I had never seen anything written in this particular computer language but I could see that the logic was incorrect. It seemed that I could just understand it. It was beginning to dawn on me that I had some natural ability in this area.

This revelation continued to be affirmed when Dr. Sharpe would discuss computer ideas with me, which he often did when he needed to talk out a problem. He was in the process of writing a new and improved compiler for BASIC and he would stand at his blackboard describing all the intricate steps of how the compiler worked. I would sit there and look at the diagrams he created and listen to his explanations.

I would follow his logic until it stopped making sense to me. Then I would get a frown on my face and interrupt him to say something like: "But previously you said it went this way and now you are saying something completely different."

He would exclaim, "That's why it's not working!" and quickly usher me out of his office as he resumed working on his compiler.

Dr. Sharpe was on the committee to buy computers for the university, and one day he invited me to a demonstration of a new computing system. We drove to an office building in downtown Seattle, where we entered a small room that was entirely empty except for a desk in the middle. On the desk was a telephone and something that looked like a typewriter. This typewriter was really a remote computer terminal and it was connected by phone lines to a computer at General Electric in Phoenix, Arizona. As we typed simple formulas, 10 + 77 for example, the numbers were transmitted across the phone lines to the computer that calculated the answer and transmitted the result back to the typewriter terminal in the office: 87. This was remote computing.

As I watched this and realized what was happening, it was as if a light bulb went off in my head and I got very excited. I could imagine the business students entering their data into this typewriter terminal and getting the results from their simulation program typed back to them immediately. No more keypunched computer cards, courier trips to the computer center, and long delays before getting the results.

"This is the way computers should work," I thought. "They should provide the answers at our fingertips." Suddenly I saw computers in a new light and I knew then that I would apply for a job as a computer programmer.

Job Opportunities (1966)

In the spring of my senior year I went to the engineering placement center and submitted my application for a job as a computer programmer. Within a week I had lined up several preliminary interviews. These initial interviews took place on campus with a recruiter from the various corporations. If there was sufficient mutual interest, I would be invited to travel to their location for further interviews.

This was an exciting time and my attention was on interviewing, not on studying. I frequented the placement center and met with the various recruiters, among them men who represented Boeing, IBM in Seattle and San Jose, the Rand Corporation in Santa Monica, and the computer division of General Electric (GE) in Phoenix. All five of these organizations invited me for a second interview at their location.

First I interviewed with Boeing, but I remember very little about it.

Next I met with the IBM sales division in downtown Seattle and learned something about a position called "Systems Engineer." Systems Engineers provided technical support for the sales team, as well as technical assistance to the IBM customers once they had purchased a computer system. The sales team and the Systems Engineers were the most visible aspect of IBM since they interacted with the customers. These IBM employees were always professionally dressed in suits and ties, for indeed most were men, giving the world the impression that IBM had a white shirt dress code.

Then I traveled to Arizona to interview with GE. My maternal grandparents lived in Phoenix where they settled, seeking warmer weather, after they retired from the Seattle School District—my grandfather as a well respected high-school math teacher, my grandmother as a nutritionist for the public school lunch program. I was happy to visit my grandparents and share my job hunting experiences with them. I was looking forward to learning more about GE since this was the company that had demonstrated remote computing to Dr. Sharpe and me earlier in the year.

But I was disappointed when I arrived. I walked into a large warehouse or manufacturing building with offices for the computer programmers on the second floor overlooking these activities. No one was talking about remote computing and the ideas I found exciting.

When I arrived for my interview with IBM in San Jose, California, I stayed in a small downtown hotel that the company had booked for me. I then drove south down Monterey Highway, a divided highway with large trees planted in the median, to the IBM Cottle Road location. I met with the personnel manager who showed me my schedule for the day. He had planned five or six interviews for me with different department managers in divisions whose names were abbreviated to initials: SMD and SDD. I felt like I was in a new and unfamiliar world where everything was encoded in acronyms and technical jargon.

At my first interview the previous applicant was just leaving and there was an animated discussion going on between the managers. It seems that this applicant, a woman, was staying at the same hotel where I was staying and had reported that the night clerk had propositioned her. Naturally, she was upset and the managers were discussing the appropriateness of the hotel that IBM had selected. I was asked if this had happened to me. I thought back to the previous evening and the strange behavior of the night clerk. He seemed flakey

and unprofessional but I did not have a problem with him. If he attempted to solicit me, I was too naive to notice.

I began my interviews. In each department I met with several people who described their projects. But with all the new terms I was hearing, I could not make heads or tails of them. I did not know the difference between manufacturing support or development. And why were they always saying "systems"? It seemed like everything was about this system or that system. Since I had limited knowledge of corporations and their internal structure, I could not distinguish the function of one group from another.

At the end of the day, around 5 p.m., I again met with the personnel manager for a closing interview. He asked me my opinion of the different departments and projects. I could hardly form one; my head was spinning with new impressions.

He pressured me to select one. "Would you take a job with this group if it was offered to you?"

How could I answer that at the end of this busy day of interviewing? I could not give him a definitive answer so I finally said, "I am waiting to see what other offers I receive before I make a decision."

Later, on reflection, I understood that he wanted to know if I would accept the offer before he went through all the paperwork to extend it.

As I left his office I walked to the large parking lot that extended for a couple of blocks in either direction. I stood, looking out over the landscape, and wondered. "Would I like to take a job here? Would I like to work here?" I crossed to my rental car and drove back north along Monterey Highway with its elegant trees.

My interview with the Rand Corporation in Santa Monica was partly thanks to Dr. Sharpe, who had worked there at an earlier time in his career. I was favorably impressed with the facility and the people I met there. However, Dr. Sharpe had told me that with only a Bachelor of Science degree in math I would probably be assigned tasks like cutting out articles from technical journals or magazines,

which constituted information gathering and saving before online computer search engines. He indicated that I would need a more advanced degree to continue with Rand, since PhDs did most of the interesting work.

Back on campus, Dr. Sharpe knew most of the recruiters from the different companies. I learned that when he saw one of them he would comment about the offers I was receiving from the other companies. "Oh, I understand you're interviewing Kathy Hitchcock. She has a great offer from the Rand Corporation, and IBM, and..."

So I had someone campaigning for me. If that influenced the amount of money I was being offered I never knew, but soon I had five respectable job offers. This was the spring of 1966 and employment opportunities were abundant, especially in the newly developing field of computer programming.

Now it was time for me to choose which job to accept. As I faced this decision it became clear to me that no one was going to give me any advice on what or how to choose. My father did not voice an opinion, my aunt and uncle refrained from offering advice, and even Dr. Sharpe maintained a neutral stance. Everyone was very interested in the outcome, but they were adamant that it needed to be my decision.

At home Aunt Lois, Uncle Lee or John decided to make a lottery out of which job I would choose. They wrote the names of the five offers on separate pieces of paper and sealed them inside envelopes. Then they sold the envelopes for $1 a piece. Whoever's envelope contained the name of the company that I selected would receive the $5 prize. No one knew what was written inside the envelope they purchased so they could not influence my decision. Even Dr. Sharpe bought one.

I quickly eliminated the two job offers in Seattle: the Boeing offer and IBM Systems Engineer position. After my four university years in Seattle the winters were too dreary and rainy for me and I wanted warmer weather. I also eliminated the job offer with GE in Phoenix

based on the sterile industrial feel of their building and offices. This left me with two offers to consider, and they were both in California. These two offers were in cities where I did not know anyone, but at the time this did not even register with me. Growing up in a military family, I had moved dozens of times in my life, so this was just another move, I thought.

I compared these two job offers with their different settings and opportunities. One was with a major computer company, the other a small think tank. I thought back over my recent trip to the Rand Corporation in Santa Monica. I remembered arriving at the large LA International Airport and driving the confusing streets to my interview. The facility was small and attractive. The people were friendly and enthusiastic about their projects even though I did not understand their work. I knew it was a prestigious firm and I was honored to have an offer. I was leaning toward taking this position.

The other offer was with IBM in San Jose. I liked the feel of San Jose. The airport was easy to negotiate. I liked the tree-lined boulevard that led to the IBM location on the Monterey Highway. I later learned that these trees were planted during the days of the Spanish missions in California along the roads that connected the missions. My offer was with the Systems Manufacturing Division of IBM. This meant that I would be writing programs to support the manufacturing activities, but that did not tell me very much about what I would be doing.

Late one evening I finally decided. I would accept the offer from the Rand Corporation. Before telling anyone I wanted to sleep on the decision and see if it still felt right in the morning.

When I woke the next morning, I reconsidered. I thought IBM San Jose would be a better decision. I based this on two factors: 1) I remembered what Dr. Sharpe said about needing an advanced degree for the Rand Corporation, and 2) I felt there was so much that I needed to learn and IBM was prepared to train me. So I choose the manufacturing support programming job with IBM in San Jose.

I walked into the kitchen that morning to announce my long and agonized decision. My aunt was making a wonderful breakfast, as she did each morning.

"I have decided what job to take," I announced as I entered.

Before I could say more my aunt interrupted me saying, "Wait, let me find my envelope."

That was the reaction of everyone I told throughout the day. Even Dr. Sharpe, when I stopped by his office to tell him, opened his drawer and searched for the envelope before I could share my decision. So while it was a life changing decision for me, others were mostly interested in whether they had won the $5 prize.

Reflecting back on this period in my life, I realize I owe a debt of gratitude to Dr. Sharpe. Later, after he moved to California and joined the Stanford Business School, we had lunch a couple of times. Imagine my surprise and delight one day in 1990 when I opened the newspaper to read that he had won the Nobel Prize for Economics[3]. I immediately called to extend my congratulations. He won this prize for work that he had done before I knew him, work that he did at the Rand Corporation.