

# Dick Sites Story, Part One

(As published in The Oak Ridger's Historically Speaking column the week of March 8, 2021)

Benita Albert brings us another story of an Oak Ridge Schools graduate. Thanks to Mike Coveyou, who suggested to Benita that Dick Sites would be a good subject for her to consider. You will enjoy this two-part series

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Dick (R. L.) Sites wrote his first computer program at age ten, a project which produced a Pascal's Triangle display, a triangular array of the coefficients in successive binomial expansions. This topic from algebra was most certainly ahead of the mathematics expected of him at that age. The computer on which his program ran was the ORACLE (Oak Ridge Atomic Computer and Logical Engine), a scientific digital computer that used vacuum tubes.

Dick said, "My mentor took my program to the Oak Ridge National Lab (ORNL), where ORACLE was housed, time and time again until it ran successfully. I wrote the program code in assembly language." Only in the fifth grade at the time, he was hooked! This son of Oak Ridge pioneers was on his path to his future, now a more than sixty-year love affair with computer science. He has made prodigious contributions to advancements in the field, continuing even now as, in his supposed retirement, he is completing a graduate textbook on measuring software performance.

Dick's classmate, Mike Coveyou, suggested that I write this alumni story about his friend from their Oak Ridge High School (ORHS) Class of 1965. It was Mike's father, Bob Coveyou, an ORNL mathematician, who introduced Dick, Mike, and another friend to coding during sessions in his home during the summer of 1959.

The ORACLE computer, Dick would later learn, was a machine Bob Coveyou helped build. It was the fastest computer in the world when it became operational in 1953. Dick remembers seeing the ORACLE through a protective glass barrier on a family visitation day at ORNL. It was one of the last "homemade computers," and it became obsolete by the 1960's.

Dick is the son of John R. Sites, a physicist who was recruited out of graduate school to come to Oak Ridge to work on the Manhattan Project in 1944. John worked in a mass spectrometry lab at Y-12 until he retired in 1983. Dick's mother, Winifred, was a homemaker and math tutor. John and Winifred were married on September 19, 1942; incredibly, this was the same date as General Leslie Groves' choice of the secret government site, Oak Ridge.

They arrived in East Tennessee with a son, Jim (born in 1943), and the family grew to include Marj (1946), Dick (1949), and Jana (1957). Older brother Jim is the retired head of the Physics Department at Colorado State University. His sister Marj has worked at a variety of jobs while living in Alaska, and sister Jana is a retired software engineer and office manager, now living in Virginia. Jim's parents moved to Colorado in 2006. They both passed away on the same date in 2016, shortly after celebrating their 74<sup>th</sup> wedding anniversary.

Dick and his siblings attended Cedar Hill Elementary School, Jefferson Junior High School (above Jackson Square), and ORHS. A February birthdate delayed Dick's school start, but he skipped second grade and eighth grade, graduating from ORHS at age sixteen. Dick described himself as a "nerd." He was one of six precocious students identified by his fifth-grade teacher, Lanis Pullum, as needing enhanced math instruction.

Through grade realignments, Dick said he was fortunate to have Pullum again for his sixth-grade year where he and friends continued their accelerated math program. However, at mid-year his teacher was told by school officials to discontinue this separate offering, since as Dick recalled, "A school board member argued that the average students in the class were being neglected."

Through the efforts of Mary Laycock, ORHS math teacher and mathematics coordinator, the six students were subsequently selected to begin Algebra I in the seventh grade. (Note: This first group led the way for an expanded seventh-grade algebra program in the Oak Ridge Schools as well as the creation of additional high school math offerings to meet the accelerated program needs.)

Dick's sophomore year included Mary Laycock's Algebra II class at ORHS. He greatly profited from her strong advocacy for his math talents and from her efforts to maximize his collegiate opportunities. Dick proudly mentioned his participation

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in Tennessee State Math Competitions: At age twelve he was second in the state in Algebra I, and this was topped off by a first place in state on the highest-level test, Comprehensive Mathematics, in his senior year.

Dick praised the special high school mathematics texts from the School Mathematics Study Group (MSG) that the ORHS Mathematics Department adopted. The MSG texts were government sponsored, enhanced curricular materials. The paperback texts ORHS students used were written by an elite committee of mathematicians in response to the "considered crisis" in the U. S. mathematics program for grades 7-12.

The "crisis" was identified after the launching of Sputnik in October 1957, and the fear of losing ground in math and science provoked a major redesign called "new math," an ambitious, accelerated, and enriched program of study. Oak Ridge Schools were among the first in the nation to participate in intensive teacher training and to use the MSG materials during the early 1960's. Dick's admiration for Mary Laycock and her special efforts to challenge him formed a lifelong bond--a later, close friendship including many visits in her home in California.

Dick was a star at math, but physical education was a different story. He said he was small and young for his age as an ORHS sophomore, and he attributes that as a part of the reason for the grade of F he received. He said, "My classmates were much bigger, and they had muscles." Dick smiled remembering that his parents snuck into a separate room to laugh upon learning about his grade.

During summers after his sophomore and junior years, Dick was chosen to attend selective National Science Foundation (NSF) Math Camps. His first summer was at the University of Florida where, along with math and geology classes, he learned to write programs in Fortran. The second summer was spent at Purdue University.

As a teen he was already dreaming of a career in computer science, and he was quietly building a resume' to suit his plans. Dick said, "I spent my high school years writing programs for my father on the CDC 1640, a 48-bit Cray." He humorously added, "It was my dad's way of keeping me off the street."

Dick described his hometown as a special environment: "...A lot of bright people with a strong interest in science. A completely safe town, especially for kids. My parents never locked the front door. I also fondly remember several foreign exchange students, especially Shigi, from Tokyo circa 1964. I was too young to appreciate that his year in Oak Ridge was only about 20 years after the bombings."

Continuing memories of his Oak Ridge childhood, Dick wrote, "The style at home when I was small was that we could earn money doing odd jobs, washing dishes and such, eventually mowing the lawn when I was big enough. My parents didn't believe in kids' allowances. My brother Jim delivered papers for the *Oak Ridger* for about five years from 1956-1961 (when he graduated and left for Duke University).

"I then delivered the same route for four more years until I graduated. The route covered Porter Rd, Union, top part of Utah, Powell Rd, East Price, West Price, and a few houses on Pennsylvania Ave. I grew up in the C-house at 101 Powell Rd. I did not know that the rest of the world managed without fixed floor plans lettered A-H until I reached college."

It was through a friend at NSF Math Camp that Dick's interest in the Massachusetts Institute of Technology (MIT) began. His parents were unsure he could qualify and also were unsure of the cost, but at least a dozen teachers and scientists supported his application with their recommendations under the determined lead of Mary Laycock.

Dick only applied to three schools, Harvard, Duke, and MIT. He was accepted at Duke and MIT, both wonderful choices, and even though his older brother was a Duke graduate, Dick chose MIT.

The summer before his freshman year at MIT, Dick lived on campus and worked in the University of Tennessee Computation Center. This job, again championed by his beloved mentor Mary Laycock, gave him access to both the IBM 7040 and the 1401. Dick described the 1401 as one of his favorite machines.

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He recalled, "Having lots of time, I could type and run programs of my own." This hands-on experience would lead him to the next step forward in the burgeoning world of computers, not only through collegiate study and access, but in his own initiatives for part time work in the computer field.

Dick continued, "At the end of the UT summer job, I asked the University's IBM representative where I might write IBM about a part time job while at MIT. In a couple of days, he came up with a generic address in Poughkeepsie, NY, so I wrote them about a job in Boston, summarizing my experience and interest in computers and my interest in IBM's announced-but-not-yet-delivered IBM System/360 line and PL/I programming language." Dick and his parents made a side trip on the way to begin his freshman year at MIT, veering the route through Poughkeepsie for a visit and interview at IBM headquarters.

Upon their arrival in Poughkeepsie, and after some confusion about his official appointment/interview, Dick remembered, "Some kind IBM person arranged someone for me to chat with for an hour... The guy had no idea who I was, but he explained he was working on operating system generation—writing a runnable operating system image on a disk. I had no clue what that was, but it seemed complicated. We went on to Boston with somewhat diminished expectations, and my parents dropped me off. I started looking for on-campus mess-hall jobs.

About four days later, I got a telegram at my dorm, asking me to call Len Page at IBM's Boston Programming Center, which turned out to be in Cambridge on the edge of the MIT campus. Telegrams were on their way out, but with no phone and way-before email, they had no better way to reach me quickly. So, I called Len the next morning and they had me over to interview.

It turned out that they were intrigued by my letter (which IBM had managed to find and forward). They had just decided to take a flyer (a "chance," "flyer" is a part of Dick's unique "Dick Speak!") on cheap college students, and I was their first prospect. They offered me an amazing \$2.50/hour for ten hours a week, and I took it. Except for a one-semester hiatus my sophomore year after I flunked a course, I stayed with them for four years. I had to go to the local high school administration office to get a work permit, since I was sixteen and Massachusetts law assumed that I must be in high school.

IBM did one amazing thing for me that year. I could order any and all manuals at no cost. Over the next four years, I devoured IBM manuals, learning about disk drives, programming languages, software diagnostics, and anything else that struck my fancy. It was a fluke gift that affected the next twenty years of my life." Dick and two of his campus friends, whom he recommended, secured approval to stay on campus over the first summer and continue their work with the Boston IBM office. The next two summers were spent at IBM in Boulder, Colorado where during the second summer he recommended a 1965 classmate from ORHS, Jeff Schmidt, for a position. Jeff was a student at Vanderbilt whose later career was as a professor of computer science at Towson University in Maryland, now retired.

After initially choosing electrical engineering studies at MIT, Dick ultimately declared mathematics for his major course of study. He reported that there was no computer science degree offered at MIT until the year after he graduated in 1969. He said that he benefitted from the many, newly-developed courses in computer science offered during his final undergraduate years. He summarized his collegiate academic experience: "I was a mediocre student. A senior year, first semester course in Point-Set Topology put me on academic probation. It was a theory course with true-false tests, which I failed. My parents panicked when they learned of my resultant academic probation for my final term, but my advisor recommended a course that allowed me to graduate. I finished in four years with a B- overall average." As an afterthought, Dick quipped, "My parents didn't want a fifth year of tuition."

Knowing all that Dick has accomplished in the world of computer science, beginning with intense part time work projects throughout his collegiate career, reminds me of so many other "computer geeks" who took the road less traveled, some even dropping out of higher education to pursue their own tech dreams and opportunities. Instead, Dick kept abreast of the rapidly changing technology world through teaching, research, and corporate computer work, while also completing a PhD in computer science from Stanford in 1974.

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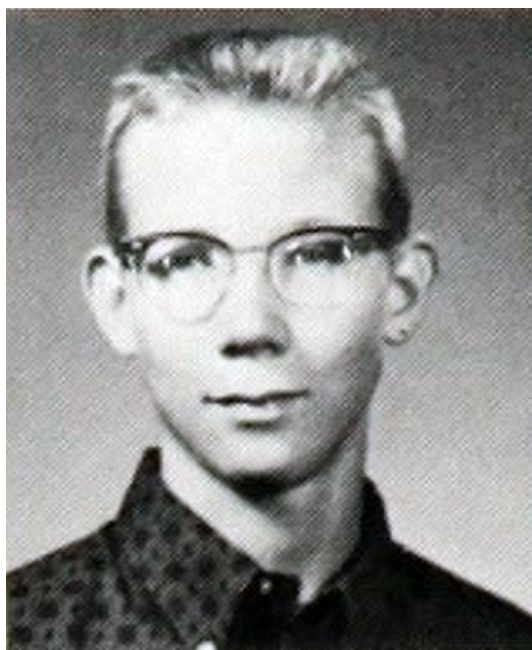
He was only nine years out of ORHS and ready for an incredible professional journey, focusing his talents on computer performance and making hardware and software faster. The second part of his story will highlight his many accomplishments and seek his counsel on personal computer security, the state of American education, and how to respond to the challenge of working in such a rapidly changing field.

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Benita has introduced us to Dick Sites and his early experiences starting at age 10 when his computer programming experience began. She took us through Oak Ridge Schools and on to his advanced education. Next Benita will take us to his career choices and significant accomplishments.

If you would like to see Dick Sites oral history, it is online: <https://www.youtube.com/watch?v=A47a6Nqa2aM>

For those of you who are interested in more details from Dick, here is a link to a talk he gave in 2015...  
<https://www.youtube.com/watch?v=QBu2Ae8-8LM>



Dick Sites while in Oak Ridge Schools



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1961 family picture at 101 Powell Rd, looking northwest, left-to-right Jim, Marj, Dick, Jana, Winnie, and John Sites

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1965 Tennessee Mathematics Teachers Association Award from the High School Math Contest