



THE TIME TRAVELLER

RONALD L. MALLETT AND
BRUCE HENDERSON

TRANSWORLD
BOOKS

About the Book

Ron Mallett was just 10 when his father died suddenly. Devastated, he found solace in the science fiction of H.G. Wells, believing that if he could just build a time machine, he could go back into the past, warn his father and perhaps save his life.

Ronald Mallett is now a professor of theoretical physics. Remarkably, this working-class African American boy from the Bronx stuck with his vision, overcoming poverty and prejudice in the pursuit of his obsession.

This is the story of Mallett's extraordinary journey of scientific and self-discovery. With simple language and elegant metaphor he lays out his theories and presents the reader with what is an actual blueprint for a time machine. A dramatic and compelling memoir, it is also a brilliant introduction to a riveting but generally baffling subject, and a truly inspirational account of astonishing achievement.

Contents

About the Book

Title Page

Prologue

One: A Death in the Beginning

Two: My Secret Mission

Three: Einstein and Me

Four: In My Father's Footsteps

Five: A Project Under Development

Six: The Education of a Physicist

Seven: My Introduction to Lasers

Eight: Finding My Academic Home

Nine: My Expanding Universe

Ten: Deeper into Black Holes

Eleven: Back from the Brink

Twelve: The Sweetness of Technology

Thirteen: Building the Machine

Fourteen: Time-Travel Paradoxes

Picture Section

Endnotes

Index

About the Author

Copyright

The Time Traveller

One Man's Mission to
Make Time Travel a Reality

RONALD MALLETT
WITH BRUCE HENDERSON

Prologue

June 25, 2002 Washington, D.C.

It was yet another hot and humid summer day in the nation's capital as I entered a large lecture hall on the sprawling urban campus of Howard University. Inside the air-conditioned hall, rows of seats rose upward from the podium, creating a theater-like setting that seemed apropos, as I was about to deliver the most important presentation of my life.

Since the age of eleven, I had told only a few confidants about my secret dream. Long fearing professional suicide, I had until recently held off revealing to colleagues at the University of Connecticut, where I am a professor of physics, my hope of turning one of man's favorite science-fiction fantasies into a scientific reality. Had I spoken of it earlier, I would not have received tenure.

The time had arrived. Before fifty or so of the world's leading physicists assembled here for the International Association for Relativistic Dynamics Third Biennial Conference, I was about to reveal in detail my plan for finally realizing my lifelong goal. It would not be enough for me to tell them my belief that this century will be the century of time travel just as the twentieth century was the century of air and space travel. No, this audience would want the nuts and bolts.

My work had been outed in the past year, which was no doubt the reason I had been invited to deliver a paper before this prestigious body, whose mission was "to

facilitate the acquisition and dissemination of knowledge about research programs in classical and quantum relativistic dynamics of particles and fields.” Yet, the fact that my research had been featured in publications as varied as *New Scientist*, the *Village Voice*, the *Boston Globe*, the *Wall Street Journal*, *Rolling Stone* magazine, and even *Pravda* (Moscow) would mean little at this august scientific gathering, and might even raise an eyebrow or two.

Sitting in the seats and peering down at me would be some of the heaviest hitters in my field of relativity physics: Bryce DeWitt, director of the Center for Relativity at the University of Texas at Austin and one of the founders of an early form of a quantum theory of gravity; Georgia Institute of Technology’s David Finkelstein, who had made several important contributions, including a novel way of looking at black holes, and L. P. Horwitz, an influential Tel Aviv University professor who had hosted the last conference and had made a number of significant contributions to relativistic quantum mechanics.

Although my work is based squarely on Einstein’s general theory of relativity—a solid foundation for any physicist to stand upon—I would be presenting some controversial results. This audience would expect to see the equations and solutions that led me to believe I had made a theoretical breakthrough that could lead to the design of the first working time machine.

For a few weeks, I had spent twelve to fifteen hours a day working on my calculations in order to be ready. I had transferred data to transparencies, which I intended to project during my talk. If I didn’t get my math right, these experts would let me know, and would be none too tactful about it in the process. Should I make a mistake in a calculation and veer off course, I would be interrupted mid-speech and subjected to in-your-face critiques—“Professor, your equations are wrong”—rather than any gentle,

instructive words of advice. That is the world of physics; we are, after all, scientists, not psychotherapists.

I was scheduled to deliver my talk at 10:00 AM that morning. Much to my chagrin, I saw on the schedule that Bryce DeWitt would be going right before me, presenting his paper on “The Everett Interpretation of Quantum Mechanics,” about the many-worlds or parallel-worlds theory of the universe. That I would be following such a well-known star to the podium made me appreciate how the guy who came up to bat after Babe Ruth must have felt.

I knew I was in trouble right away when DeWitt started off by saying that a speaker needed only six transparencies to discuss his ideas, which, of course, was the exact number he had brought along. I looked down with dismay at my bulging folder, crammed with twenty-six transparencies. DeWitt went on to say that he always told his graduate students that they need not tell their audience everything they knew about a subject. I told myself to keep breathing.

DeWitt, a legendary and pioneering theoretical physicist, received his Ph.D. from Harvard in 1950. Tall, lean, and energetic, DeWitt had hiked in the Himalayas and Africa. During World War II he served as an aviator and after the war conducted research at the famed Institute for Advanced Study at Princeton, which was at that time also Einstein’s academic home.

Elegant is an adjective often used by DeWitt’s colleagues to describe his use of mathematics in physics, and it is certainly a compliment. The elegance in his work showed in the natural flow of his physical arguments, and the beauty was to be found in the pleasing symmetry of his equations. As a graduate student, I had learned that elegance and beauty in physics were nearly as important as whether an idea was correct. DeWitt’s presentation about one of the strangest consequences of quantum mechanics—the possible existence of parallel universes—could play an

important role in the possibility of time travel, so he had my rapt attention.

Quantum mechanics is the mechanics of sudden energy change. In quantum mechanics, energy cannot be gained or lost continuously, but only in fits and starts. In 1913, the Danish physicist Niels Bohr,¹ often called “the father of quantum mechanics,” showed that the electron orbiting the proton in the hydrogen atom can change its orbit only by either gaining or losing a certain definite amount of energy — no more and no less. These definite, or discrete, amounts of energy are called quanta of energy.

In 1957, physicist Hugh Everett III,² then a recent graduate of Princeton, first applied quantum mechanics to the entire universe, which resulted in his many-worlds, or parallel-worlds, interpretation of quantum mechanics.

Quantum mechanics, in short, is a world of probability. In the ordinary, everyday world, when a pitcher throws a baseball, it is possible to describe exactly where the ball is and how it’s moving. In the world of quantum mechanics, we can only say what will probably happen next, as we can’t know exactly what an object is going to do.

In applying quantum mechanics to the whole universe, Everett found that whenever there is the possibility of more than one outcome for an event, there is a potential split in the universe. For example, suppose that at lunch you are trying to decide between a cheeseburger and a tuna sandwich. At the moment you make the decision, according to Everett, the universe splits into two parts. There is a universe in which you have chosen the cheeseburger, and there is also an equally real universe in which you have chosen the tuna sandwich. These new universes are parallel and separate. The you in the universe with the cheeseburger is not aware of the you in the separate universe with the tuna sandwich. Although this idea of a parallel universe seems incredible, it is completely consistent with the proven theory of quantum mechanics.

Like everyone in the audience, I was familiar with Everett's parallel-universe theory. I had used the cheeseburger-tuna sandwich example many times to explain the theory to general audiences. And yet, I was enthralled by De Witt's masterful though highly-technical discussions of concepts like the "wave function of the universe." When DeWitt finished, I went to the podium. Having not forgotten his pronouncement that a speaker needed no more than six transparencies and did not have to tell the audience everything the speaker knew about a subject, I decided to face the situation straight up. "Just to let you know—I have no more than sixty transparencies. When I found out that Professor DeWitt was in the audience, I felt as if I was back in graduate school, and that I'd want to show him everything I know about the subject."

DeWitt and the audience laughed, and I caught my first deep breath.

I began by reviewing the tenets of Einstein's general relativity theory, which in this crowd of relativistic physicists was akin to preaching to the choir. Forthwith, I began to outline my own theories based on Einstein's work, projecting on a screen my transparencies with illustrations, equations, and final solutions, which I said showed that space and time could be manipulated in a whole new way that would lead to the possibility of time travel into the past.

A satisfying thought hit me—my dream and I had come a *long way*.

Then, I realized that pencils and pens had been put to paper in those rows of seats above me and that my esteemed colleagues were busy scribbling away as they began working through my calculations.

“Flight by machines heavier than air is impractical ... if not utterly impossible,” stated one of the great scientists of the nineteenth century, Johns Hopkins professor of astronomy Simon Newcomb (1835–1909), who spent much of his career producing improved orbital tables for the moon and planets. Newcomb was convinced that a new metal or unknown force of nature would have to be discovered before man could consider taking to the skies. Even should a “power-machine” be invented that could lift a man off the ground, he predicted it would fall “a dead mass” to the ground and kill anyone aboard.

Simon Newcomb’s comments about the impossibility of manned flight were published in 1902.

A year later, Orville and Wilbur Wright proved the expert wrong.

One

A Death in the Beginning

TIME STOPPED FOR me in the middle of the night on May 22, 1955.

My parents, Boyd and Dorothy, had hours earlier celebrated their eleventh wedding anniversary. Mom was the prettiest of all the mothers, and I idolized my smart dad. They looked happy that evening, and it was clear they were very much in love.

My two brothers and I knew we were loved, too. My earliest memory is of a happy family outing to a neighborhood park.

That night, a Saturday, my parents had invited a dozen friends over to our apartment in a new complex of projects at 1455 Harrod Avenue in the Bronx. The house was filled with music and laughter, and my mother had prepared a turkey dinner with all the trimmings. The adults mixed bourbon cocktails, told stories, cracked jokes, and smoked cigarettes. My father, a renowned prankster and electronics whiz, had wired speakers all around the house—including a new installation in the bathroom, which dispensed music whenever the toilet seat was lifted. As it grew late, the kids were shooed away. Snuggled up in my bed, I must have fallen asleep feeling happy and secure.

My father had big plans, and our future seemed bright. We were to relocate in a few months to Long Island, where he planned to open a TV repair shop. A hard worker, Dad had been holding down two jobs—working for Sigma

Electronics by day and repairing TV sets on nights and weekends. He was skilled, it seemed, at everything he attempted. He had helped wire the new United Nations building in Manhattan, and made TV repair calls on the likes of Jackie Cooper and Walter Matthau, both of whom, in appreciation of his work, gave him a signed photograph. My father built our first TV set, complete with a magnifying screen that made the picture larger. Not long after that, he delivered to my maternal grandparents in Pennsylvania one of their town's first television sets. My grandfather's favorite pastime soon became watching women's roller derby, and he howled in delight whenever a collision sent skaters flying off the track.

My father was a handsome, robust man with a soft baritone voice. He had a natural warmth with people, and possessed a gentle manner and keen curiosity. Although he put in long hours, he was never too tired to answer my questions about how things worked. When he was twelve, he had lost his father, at age forty-three, to silicosis, a lung disease brought on from breathing silica dust that results from the manufacture of bricks, a job my grandfather had done for most of his adult life. I would come to recognize that my father was deeply affected by his boyhood loss. Driven by a determination to rise above a menial labor existence for himself and his children, he also seemed troubled by the possibility of his own early death.

Mom and Dad grew up and went to school together in Claysburg, a rural hamlet in central Pennsylvania. Claysburg's black population resided predominately in town on Shanty Row, where Dad's widowed mother lived in a company house next to railroad tracks, and in an outlying area called The Field, where Mom's family had a small farm with chickens. My two sets of grandparents—Ira and Etta Mallett and William and Pinky Kimbrough—grew up in Mississippi and together ventured north in 1917 to escape racial injustice and find a better life; they ended up in

Claysburg, where my grandfathers went to work making bricks at the "Brickyard," as did most of the local men.

Somehow, given the closeness of the families, it seemed right to everyone when my parents fell in love. Married just before my father went to war, my mother was pregnant by the time he shipped overseas. Dad served as a battlefield medic with a unit that took part in the first crossing of the Rhine by U.S. troops in early 1945. Later, Mom revealed that he was at times haunted by the memory of the suffering and death he had seen in combat, although it was not something I heard him discuss. A few weeks after crossing the Rhine, he became a father when I was born in Roaring Springs, Pennsylvania, on March 30, 1945.

After the war my father enrolled at a New York electronics school under the GI Bill, and worked as maintenance superintendent for our building in exchange for free rent. After learning his trade he always had a good job, which allowed Mom to stay home with our growing family. My brother Jason was born a year after me, followed three years later by Keith, and then Eve, eight years my junior.

Dad preached the importance of an education, and would withhold my twenty-five-cent weekly allowance until I passed his quizzes, such as testing my memory of the multiplication tables. Once, frustrated by too many wrong answers, he took me over to the living room window. Below was a new highway construction project, and I could clearly see a team of ditch diggers bending their backs to the arduous labor. "Is that what you want to do?" Dad asked. I told him no. "Then you better take multiplication and school more seriously."

One day he brought home a crystal radio set with earphones and helped me set it up in my room. By adjusting a small coil I could hear AM stations. I was intrigued with how the device could snatch signals out of the air from some distance away. Although we had a big

console radio in the living room, my crystal set seemed more amazing because I had built it with my own hands and it was so small. Another memorable gift from my father was a gyroscope with a metal rotary wheel, and a string attached to a spindle. When I pulled the string, it spun the wheel, which in turn danced atop a little pedestal until the rotation stopped. As I watched, it was clear that the rotation kept the wheel from falling, *but why?* Dad talked about the energy of the spin and the axis of the rotation, explaining terms I had never before heard but which made sense to me given his easy-to-understand examples.

At this juncture of their lives, my parents had much to look forward to—four healthy children, my father's new business, life in the suburbs. Our previous Christmas had been joyful. Dad took on added work to have extra money, as he enjoyed seeing stacks of presents under the tree. It was important to him for us to believe in Santa Claus, but by then I began to figure that the jolly bearded white guy had some help from Dad. Encircling the tree was a train track, and a Lionel electric train rigged to stop and go on voice commands.

My father was not always the life of the party. He would sometimes sit alone in near darkness, reading poems into his tape recorder with opera music playing in the background. At these times he seemed very sad, and I didn't understand why. Only in later years would I begin to piece together some possibilities as to what may have been troubling him at those times.

That Saturday night, after the anniversary party guests departed, Mom told me later, she suggested cleaning up in the morning because they were both tired. With church in the morning, Dad said he would rather do it before bed and got started. As they worked side by side, they discussed our upcoming vacation to Claysburg; Mom wanted to take the train or bus and Dad favored driving. They had recently

bought their first car, and we had been enjoying Sunday rides.

I always looked forward to going to Claysburg and visiting my three surviving grandparents. We spent most of our summers there, with Dad joining us for his two-week vacation from work. My brothers and I ran through the fields and hills with our cousins, reveling in the open spaces. My father and maternal grandfather, Grandpap, got along well and enjoyed one another's company. I recall a familiar scene of my father relaxing in a lawn chair reading an electronics magazine. In my memory, Claysburg is always sunny, and in the middle of one of those lazy summers.

My parents carried their discussion that night into the bedroom. When Mom turned off the bedside light, she heard Dad sigh deeply. Thinking he was exasperated with her insistence about not driving, she said, "Okay, let's talk about it tomorrow." She nudged him playfully, and his head fell off the pillow like a sack of flour.

Awakening to my mother's soft crying, I got up to investigate.

When I stepped into the hallway, I heard her whimpering. "Oh, Boyd. Boyd." She was in the kitchen with the lights on. I heard a strange voice, and saw that a policeman was with her. Down the hall in the other direction was my parents' bedroom. If I turned left, I'd go to the kitchen; right, to their bedroom.

I went right, opened their door, and stepped into the dark room.

My father was under the covers. He wasn't moving, but he looked fine to me. *Was he asleep?* I went around the bed. My brothers had silently followed me into the room. Before I could touch Dad, a policeman appeared and ordered us out. He took us into the kitchen where Mom, dabbing her reddened eyes with a wadded tissue, sat at the table shaking her head sadly.

We three boys lined up in front of her. She took a deep breath and looked up at us. Although I cannot remember her exact words, she told us that Dad was dead. I remember feeling as if I was stuck in some kind of a bad dream I couldn't get out of. Everything after that, in fact, became very dreamlike, and my memory is filled with fleeting impressions—some dreadful, others a bit odd.

For some reason, Dad's body remained in the house until Monday. Apparently there was a delay in finding the doctor, who was required to sign the death certificate; Mom also remembers something about a citywide work slowdown by undertakers. So Dad stayed in his death bed. As if in slumber, he lay there with the covers undisturbed. In the hallway outside the bedroom stood a uniformed officer intent on keeping out visitors. Mother, however, insisted on going in a number of times, and the guard always relented.

The next thing I recall are my aunts and uncles at the house with plates of food, and being taken aside by one uncle and told how I was now the man of the house. I was ten years old, two years younger than Dad had been when he had lost his own father.

At the funeral home a few days later I stood at my father's open casket, still feeling as if everything was unreal. Mom had Dad dressed in his blue suit, and he looked handsome. He seemed to have fallen asleep without any pain or agony registering on his face. He seemed so *alive*—as if I could nudge him awake and say, "Hi, Dad. It's good to have you back."

Since the night my father died, I had been in shock, and numb—at times feeling this was not happening. I experienced the same disconnect at the funeral home. Then we took the long, slow ride to the veteran's cemetery, where he was given a military funeral, with a bugler blowing taps and seven ramrod soldiers firing their guns into the air three times each, loud reports that caused me

to jump. Mom, dressed in black, sat holding the folded U.S. flag from the casket.

As I stood looking down into that horrible hole a coldness came over me that I would not soon shake. As if awakening suddenly, everything around me took on a chilling clarity. Emotionally confronting my father's death for the first time, I began to comprehend that I would never see or talk to him again.

Dad's final resting place was in Long Island—the only one of us who made it there—ending up in death, ironically, where we had planned to move and start a new life together, and where he was going to open his new business.

I began crying a quiet, sorrowful weeping that came from deep within.

When I saw my father into his grave, he was thirty-three years old.

Two

My Secret Mission

AFTER WE BURIED Dad, Mom went to work at a Manhattan restaurant on Forty-second Street making salads and sandwiches to be sold in vending machines. She had regular hours, and every morning on her way to work she would take my sister, Eve, to the free daycare center located in the projects. I was responsible for making sure that my brothers and I reached the school bus on time, and for housekeeping chores like folding laundry, dusting, and mopping floors. Sometimes I helped with dinner—peeling potatoes to have ready when Mom arrived, or cooking hamburgers and creamed corn for my brothers and myself.

One of my jobs was to take a cart and wait in line once a month at a depot in the projects where free food was handed out by a government agency. I would return with our family allotment of flour, sugar, cheese, and other basics. My mother's employer regularly sent her home with restaurant leftovers. Looking back, I'm not sure how she managed, keeping us healthy, fed, and clothed while dealing with the emotional weight of my father's death. Late at night, I would hear her crying in her room, or come upon her at the kitchen table sipping milk and whiskey and listening to sad music. Mom's loss was mine, and her anxiety was contagious. Like her, I had no idea how we would manage, let alone be happy again, without Dad.

As I went about my new routine, I was aware that something had happened inside of me. It was as if I had shut

down, and was just going through the motions. Once a naturally exuberant child with a gregarious personality, I became withdrawn and sullen. My father's absence left a void in my life that nothing seemed to fill. The how-and-why questions I had always put to him now went unasked. Schoolwork lost its meaning, as I knew there would be no more weekly quizzes that I needed to be sharp for. Just hearing the classical music he loved could bring me to tears. It was unbearable to think I would never be able to meet him at the end of the day at his subway stop. I was always so overjoyed to be in his presence, and thrilled when he let me carry his toolbox the rest of the way home. With his sudden and unexpected departure from my life, my childhood ended, and happiness was no longer my natural state. In a real way, a part of me was lost forever.

Mom began dating, and even at my young age I understood it was because she was terribly lonely. Among a series of men was a truck driver with whom she would get into terrible arguments. I recall us driving one night through a dark tunnel somewhere, and Mom and this guy arguing violently. He drove fast and erratically, and I cowered in the back seat, fearing an imminent crash. I was glad when he stopped coming around. I wanted Mom not to be so lonely and unhappy, but none of the men she dated were anything like my father.

Two summers after my father died we moved to Pennsylvania. Much later, Mom told me we did so because my maternal grandfather had insisted she return home. Concerned about her behavior with men, as well as the stress of raising four young children on her own, Grandpap wanted us all under his roof so he could keep an eye on her and so Grandma could help with childcare. By then, Grandpap had retired from the Brickyard and they had left Claysburg—forced out when a state highway was built through their property—and moved fifteen miles up the road to Altoona, where my mother's brother lived with his

family. Compared to tiny Claysburg, Altoona—population 100,000—was a metropolis. However, I never felt as comfortable there as I did in the Bronx or visiting sleepy Claysburg.

Mom went to work as a cleaning lady at a dress shop, and left every morning looking as if she would be taking over the front office any day. Cleaning lady or not, she had her pride, and when Mom dressed up it was impossible not to notice her. Customers began to ask her advice about a blouse or a dress, and she was soon promoted, becoming one of Altoona's first black salesclerks. It was a lesson not lost on me. I observed that when one communicated an inner pride, it was often returned in the form of respect from others. While I was fortunate to have had a smart and ambitious father for the decade I did, I am still blessed to have a proud and strong mother.

The year after we moved in, Grandpap took ill with the same Brickyard malady that had killed my Dad's father: silicosis, the dreaded "white lung disease." I knew Grandpap was really sick when the televised roller derby held no interest for him. Mom and Grandma took care of him round the clock, and in the end he required an oxygen tent. After his death at seventy-eight, Mom felt it was time for us to have our own place. Using Dad's GI home loan, she was able to buy a modest house in an all-white neighborhood, and Grandma moved in with us. It turned out the house was affordable because it was located at the bottom of a hill right next to the railroad tracks that ran through Altoona, which served as a hub of rail traffic between Pittsburgh and New York. The entire house would shake on its foundation whenever a speeding train passed.

The move to Pennsylvania brought about something more drastic than simply a change in scenery. To that point in my life, being "colored"—the description of African-Americans popular at that time—did not have a negative meaning to me. In the Bronx, we lived in a predominately

Jewish neighborhood, and I had never faced any hostility. As the only black member of a white and largely Jewish Boy Scout troop, I had never been treated any differently. And every summer when we went on vacation to Claysburg, my brothers and I played with our cousins and their white friends without incident. I had every reason to believe that things would be no different in Altoona.

Once settled in our new neighborhood, my brothers and I went exploring to meet some of the local kids. We spotted a group of four white boys playing nearby, and ran up to say hello. They looked at us, and one of them spat, "Niggers." I was stunned. I had never been called that horrible name— not in the Bronx or in Claysburg. Not anywhere. Something snapped inside me. Leaping forth without regard for the fact that I was outnumbered, I pounded the boy furiously with my fists until he said he was sorry. None of the other white boys made a move, and my brothers remained frozen like statues.

That ugly welcome to Altoona made me conscious of my race in a new and negative way, and because of my already precarious emotional state, it made me more depressed. I had a strong sense of being an outsider, and longed more than ever for my past life—when my father was alive and we were happy.

After the death of Grandpap, my grandmother went rapidly downhill. She began wandering aimlessly around town, and once took a train to Chicago "looking for my children," believing that Grandpap and their children were waiting there for her. When she became unmanageable, Mom was given no choice but to have her committed to the state hospital, as there were no affordable care facilities for patients with advanced senility—what would likely be diagnosed today as Alzheimer's. I went with my mother on Sundays to visit Grandma at the hospital where she was to live out her final years. Once in a while I could glimpse in

her vacant eyes the loving woman I had known, but for the most part Grandma left us well before her death.

Abject unhappiness is my overriding memory of my Altoona years. Losing interest in school, I began not showing up there. Sneaking back home after my mother left for work, I would climb through the basement window and spend the day alone in my room. Mom found out only when a truant officer came to our door. Though I was threatened with restrictions, I cared little since I didn't have any friends or activities anyway, so my truancy habit continued through the seventh and eighth grades. Still mourning the loss of my father, I became increasingly isolated and embittered. Not interested in games, sports, or socializing with my peers, I escaped into magazines, books, and movies, many of them fantasy and science fiction, which succeeded in taking me away from my reality. I indulged in endless daydreams about faraway, make-believe places complete with good-versus-evil battles and noble heroes—worlds far more enchanting than my own.

I had been captivated with the Knights of the Round Table since Dad took us to the 1954 movie *Prince Valiant*. I had since identified even more with the gallant knights and their noble cause, wishing I could right a terrible wrong (my father's death) and protect a damsel in distress (my mother). Before long, I would even find my own Holy Grail, which would lead me on a long quest.

My life-altering discovery came from an unlikely source. *Classics Illustrated*, published by the Gilberton Company, reprinted 167 titles in comic-book format (I probably read all but a dozen or so), summarizing and illustrating for young readers the plots of classic books. They cost fifteen cents, a sizable expenditure in light of my twenty-five-cent weekly allowance. I had started reading them while still in the Bronx, and by the time we moved to Pennsylvania my collection included *Knights of the Round Table*, based on Thomas Malory's classic, *The Death of Arthur*; Sir Walter

Scott's *Ivanhoe*; Charles Dickens' *A Tale of Two Cities*; Robert Louis Stevenson's *Dr. Jekyll and Mr. Hyde*; Mary Shelley's *Frankenstein*; Jules Verne's *20,000 Leagues Under the Sea*; Henry Wadsworth Longfellow's *The Song of Hiawatha*; Homer's *Iliad*; and Shakespeare's *Julius Caesar*, *Hamlet*, and *Macbeth*.

I vividly recall the moment when I spotted *Classics Illustrated* No. 133 on display in the magazine rack of a drugstore not far from our house. The cover illustration struck me like a bolt of lightning. A solemn-faced man, surrounded by a futuristic scene, sat atop a strange machine that looked to be a cross between a motorcycle and a one-man spaceship. The machine had various hoops, tubes, and wires projecting from it, and the man was grasping two levers that appeared to control the machine. The title at the top read:

THE
TIME
MACHINE
H. G. WELLS

Entranced, I opened the magazine. On the first page was the same man, pictured smoking a pipe while intently working on the machine in a room with greenhouse windows. Tools laid out on a wooden platform included screwdrivers, wrenches, small torch, oil can, screws, bolts, electrical cords. The man was tightening a strip of white tape around some part of the machine.

Printed in the text box at the bottom of that first page was the following:

Scientific people know very well that time is only a kind of space. We can move forward and backward in time just as we can move forward and backward in space. To prove this theory, I invented a machine to travel through time. If you pressed one lever, the machine went back into the

past. If you pressed the other lever, the machine glided forward into the future. With this machine, I set out to explore time.

I was dumbfounded. *"We can move forward and backward in time just as we can move forward and backward in space. ..."* The most incredible and wonderful thing I had ever heard, these words filled my wounded heart with hope. *"Scientific people know very well that time is only a kind of space. ..."* Experts *knew* this? Did this mean—could it *really* mean—I might be able to go back in time and warn my father to go to the doctor, slow down, take better care of himself? Things to prevent that frightful night from happening. Could I change his fate? And mine? Could I bring him back? I dropped three nickels on the counter and raced for home.

Alone in my room, I sat on my bed and began reading:

One summer evening toward the end of the nineteenth century, some friends of mine were gathered in my home in Richmond, England, as I entered.

"Good heavens, man! What happened to you?"

"Were you in a wreck?"

"I have just travelled through time. I don't mind telling you the story, though most of it will sound false to you. But it's true, every word of it. ..."

The time traveller told of having made the last adjustments on his time machine. "I gave it a last tap, tried all the screws again, and put in a final drop of oil. I climbed up, sat in the saddle, and took the starting lever in my hand." He pushed the lever forward slightly, and within seconds noticed that the clock on the wall had moved ahead five hours. He took a deep breath, gripped the lever with both hands, "and went off into time." While his machine stayed in the same place, the time around him quickly advanced, and he went through rapidly-flashing scenes of what the future would hold.

He eventually stopped to see the future for himself. The surface beneath him suddenly became uneven, and the machine reeled over, flinging the time traveller onto the ground. He found himself in the midst of a forest during a rainstorm. Righting his machine and checking the instruments, he saw that he had travelled 800,000 years into the future. He walked around in the rain, coming upon a huge, forbidding structure with no windows or doors.

Deciding to return to his own time, he took his position in the machine and prepared to pull back the control lever when he heard voices. People speaking a "very sweet and musical language" approached him. He soon knew he had nothing to fear from these "simple and childlike" people, who called themselves Eloi, and joined them for a meal. When he returned to where he had left his machine, it was missing. He found tracks suggesting that his machine had been dragged into the nearby structure and solid doors closed behind it.

Soon thereafter, the time traveller saved an Eloi from drowning in a lake. Her name was Weena, and she was beautiful. In thanks, she gave him flowers of a variety he had never before seen. He placed two of them in his pocket to examine later. In the days that followed, the time traveller and Weena fought off the Morlocks, strange creatures that resembled human spiders, in a nighttime battle in a burning forest. Finding the doors to the structure open and his time machine a few feet inside, he started to drag it outside when the doors closed. Surrounded by Morlocks, he quickly activated the machine and pulled back on the control lever. He ended up back in his time at the opposite end of the room—the same direction and distance that the Morlocks had dragged the machine. The time traveller then walked into his parlor where his friends had gathered. "Incredible? Yes," he admitted to his friends. "Take it as a lie, if you wish. I hardly believe it myself. And yet ..."

And yet, he had those two flowers from Weena still in his pocket.

Before leaving my bedroom, I read the story several more times.

Then I went into the basement and shut the door behind me. I knew exactly what I was looking for: my father's tools, last used by him and brought with us in our move from the Bronx. I opened the first box with competing degrees of exuberance and reverence. Carefully, I laid them out before me. Screwdrivers, wrenches of various sizes, screws, bolts, nuts, electrical wires. I found in other boxes pieces of radio receivers, television tubes, an oil can, soldering iron, and rolls of electrical tape.

Although it would take days for me to gather the other materials I needed, my plan had come together that first day. I had a secret mission that made me eager to wake up in the morning, and I did so with renewed purpose.

I tried to build the machine exactly as I saw it on the cover of *Classics Illustrated*, using television tubes, discarded pipes, and other junk. From watching my father work, I knew something about electronics, and he had always been patient about explaining what he was doing. I spent hours down in the basement each day, putting together the old tubes, wires, electric parts, and attaching some old car tires for landing gear. Finally, it seemed I had something. I plugged it in and pulled on some levers, but nothing happened.

I was disappointed but not discouraged. The time-travel story had mentioned "scientific people," and I concluded that I needed to learn science. That would allow me to put things together correctly, and build a working machine. But first, I wanted to read more about the time traveller and Weena. I went to the public library and took out Wells' original book. I needed a dictionary for even the first sentence: "The time traveller was expounding a recondite matter to us." I had to look up "expounding" and