

LIFE STORY OF A MIDDLE AMERICAN

Thomas Alva Edison was born in 1847 in the up-and-coming Ohio town of Milan. When he was six, he and his family moved to Port Huron, Michigan, another Midwestern village just entering the first flush of a prosperity born of vigorous commerce with the rest of the country, to which it was linked by the Grand Trunk Western Railway via the industrial metropolis of Detroit, which in turn communicated by lake to all the wide world beyond.

Popular culture, including a host of Horatio Alger-style juvenile biographies and two enduring film classics, *Young Tom Edison* (with Mickey Rooney in the title role) and *Edison the Man* (starring Spencer Tracy)—both released in 1940—have portrayed the inventor as a maverick child whose budding genius was both exceptional and utterly misunderstood, presaging an adult destined to blossom into a lone-wolf inventor, a creative genius who amply deserved the titles of “wizard” and “modern Prometheus.”

Yet the fact was that Edison’s boyhood was not at all unusual for his time and place. He was intensely curious, and his curiosity sometimes got him into trouble. Boys, as they say, will be boys, and mid-nineteenth-century America was chock full of curious boys. He was bored in school, attended classes only sporadically, and left altogether after a very few years to be home schooled by his doting mother. The very same can be said of most American boys during this period, an age when children typically attended no more than a few years of elementary school and then, before hitting their teen

years, entered the workforce. The luckiest ones, like Tom Edison, had capable and willing mothers who administered the bulk of their education.

Familiar, too, is the story of how the bright, ambitious twelve-year-old Edison got himself a job as a “news butcher,” a concessionaire on the Grand Trunk Western Railway, purveying newspapers, magazines, candy, sandwiches, and other merchandise to passengers between Port Huron and Detroit. Employment as a news butcher was quite common for boys during the mid-nineteenth century. Now it is true that young Edison did much more than merely sell copies of the *Detroit Free Press*. He started writing, editing, and printing his own paper, replete with news of local interest. Was this remarkable? Of course it was. But unique? Not at all. Edison’s paper was just one of a good many self-published local papers that sprang up across the country, many of them produced by youths and teenagers. Without question, Edison did introduce a startling innovation into this pattern by using a small proofing press, salvaged from the offices of the *Detroit Free Press*, to print his paper aboard the moving train. This not only increased the novelty appeal of Edison’s paper, it gave the news he presented a freshness that approached real-time reporting. It also allowed the young entrepreneur to make maximum use of his travel time by running off copies in a corner of the baggage car. Later, he even cleared a space in that baggage car to accommodate both his press and a table for experiments—something doubtless no other news butcher did or even thought of doing. If there is one quality Edison was indisputably born with, it was a keen awareness of the precious scarcity of time. From a very early age, he was driven to pack every moment with productive work.

Without a doubt, Thomas Edison was an innovator from a very early age; nevertheless, he had more in common with others of his era than differences from them. Like most of his young fellow countrymen, he was intensely interested in the ongoing transportation revolution that was sweeping the nation, the burgeoning of the railroads, and the related revolution in communication technology: the telegraph. Development of

both technologies was spurred by the ongoing Civil War, which brought increased demand for transportation of goods and people and for instantaneous communication, including the communication of news. Young Tom's involvement with the railroad and with the news business brought him into contact with the world of telegraphy and telegraphers, and his interest in this technology quickly meshed with his natural scientific curiosity, pointing it in the direction of electricity, technology, and invention. When he started working as a telegrapher in 1863, Edison entered a fraternity of technology-minded young men, many of whom were, if not inventors, at the very least compulsive tinkerers, never content to let an electromechanical device exist without trying their hand at improving it. Most telegraphers worth their salt devoted considerable time to modifying, personalizing, or otherwise tweaking this or that feature of the equipment they used. The teenaged Edison found himself in a culture that both nurtured and demanded innovation and the solving of technical problems, almost always hands-on and on the fly. Moreover, the demand for instantaneous communication—from person to person, business to business, and reporter to newspaper—was always outrunning the available technology. Telegraph companies were perpetually hungry for invention, and they were willing to pay for it.

After some four years working as a “tramp telegrapher”—an itinerant key operator who had built a reputation among fellow telegraphers for his facility with technical innovation—Edison returned briefly to Port Huron, then in 1868 secured the backing of a Boston businessman and moved to Boston, where he set up as a full-time inventor. At the time, Boston was a major financial center, which also offered the technological resources of great universities and their libraries. The financial climate, together with the sophisticated scientific and technological environment, launched Edison on his life's work.

His first patent was for an electric vote recorder developed in 1868. The invention was a technical success—meaning that it worked as promised—but it was a commercial failure, meaning

that it failed to find a market. Edison had invented it with the intention of selling it to local, state, and federal legislative bodies, having simply assumed that these customers would welcome a quick and efficient way of recording the many votes they took in the course of their work. In fact, when Edison demonstrated the device, he discovered that the very last thing legislators wanted was a quick and efficient means of voting. They had grown accustomed to exploiting the laborious and antiquated process of the roll call vote to gain much-needed time for last-minute cajoling and the marshaling of required votes. From this initial popular failure, Edison drew a valuable lesson. He resolved from then on to determine—firsthand—the existence of a market and a need before embarking on any other invention. For him, that lesson was sufficient to turn momentary failure into lifelong success. Nothing, Edison believed, was truly a failure if you managed to learn something from it.

Even though he did not grow instantly rich from the electric vote recorder, Edison's experience with the device gave him confidence in his ability to invent and innovate, and in 1869 he moved to New York City, setting up his first formal business as a manufacturer of telegraph equipment, working primarily as a subcontractor for Western Union and other companies. Two years later, in 1871, he established his own factory and combination laboratory–workshop in Newark, New Jersey. In this year, too, he married his first wife, Mary Stilwell.

Edison's most important inventions in the field of telegraphy enabled the simultaneous transmission and reception of multiple messages over a single line—a breakthrough that instantly and cheaply multiplied the capacity of the nation's telegraph system. His first quadruplex telegraph equipment was patented in 1874, and Edison used the proceeds from this and other telegraphic inventions and innovations to buy land and to build on it his most famous laboratory–workshop complex, in then-rural Menlo Park, New Jersey.

Set well apart from the roar and distractions of the big city, Menlo Park was nevertheless close enough to Manhattan to maintain important financial and cultural ties with the center of American commerce. At Menlo Park, Edison created what must be called a technology village, a pioneering industrial research facility—perhaps the world's first dedicated full-scale research and development enterprise. Edison himself dubbed it an “invention factory,” and for an increasingly news-hungry press, Menlo Park became the lair of a modern wizard, a nineteenth-century Prometheus, who delivered to the world, with remarkable regularity, one technological wonder after another. The phonograph emerged in 1877, the year that also saw the creation of the carbon button transmitter, which, when perfected, would transform the Bell telephone into a truly commercial, reliable, and robust communications instrument, a device that quickly became indispensable to the modern world. In 1879, Edison demonstrated the first successful and durable electric incandescent lighting system, which included not only the incandescent lamps themselves but a fully developed system for generating, distributing, regulating, measuring, and retailing electric power. In short, Edison invented and innovated a new industry—the electric power utility—which forever changed the course of civilization. By 1882, he went to work on the electrification of lower Manhattan.

In 1884, Mary Edison died suddenly, and two years later Edison married his second wife, Mina Miller. A year after his wedding, in 1887, he built and moved into a larger laboratory–workshop–manufacturing complex in West Orange, New Jersey. Here, in 1888, he made extensive improvements on the phonograph, laboriously transforming it from a charming curiosity into a commercial product of enormous influence and profitability. In 1889, he formed Edison General Electric, then went on to create the kinetograph, an early motion picture camera. It was not until 1894 that he paired the kinetograph with the kinoscope, a motion picture peephole-type viewer, opening up the first commercial

motion picture exhibition “parlor” in New York City later in the year.

This recitation of major inventions leaves out Edison’s very nearly continuous stream of minor inventions and innovations, many of them extremely profitable, adding up, before the end of the inventor’s life in 1931, to 1,093 patents—a record no other individual has ever come close to equaling, let alone breaking. There were, in this remarkable career of invention and innovation, technical and commercial failures, of course, the costliest of which was a decade-long effort to develop a commercially viable process for electromagnetically separating iron from cheap low-grade ore. Likewise, Edison’s efforts, early in the twentieth century, to develop a more reliable and practical storage battery to power electric vehicles were threatened by the remarkably rapid demise of electric car technology after Henry Ford successfully marketed his mass-produced Model T in 1908, thereby ensuring the triumph of the internal combustion automobile fueled by gasoline. In typical Edison fashion, the inventor recovered from both disasters. He managed to convert much of his capital investment in the ore-separating enterprise—especially his heavy machinery—into an advanced plant for the manufacture of Portland cement, and when his intended market for the storage battery crumbled away, he innovated a host of new applications for his improved storage battery, ranging from powering railway signals to providing lighting for houses and businesses isolated from the very electric lines his power technology was in the process of laying or stringing.

Edison never stopped inventing. At the very end of his life, he was researching a process for commercially extracting rubber from goldenrod, in the hope of providing a cheap and plentiful domestic source of rubber for industry, especially the burgeoning automobile industry. The scope of his interests and his practical innovations is staggering—everything from electric light to artificial cement—yet his single most important invention was never patented or embodied in a single device. It was the notion of creating and operating an “invention factory”: a set of methods and practices aimed

at freeing up and stimulating the creative imagination even as it harnessed that imagination in a reliable, regular, businesslike way. Edison invented the modern discipline of industrial research and development, a means of making creativity, invention—genius itself—so predictable and reliable that it could be summoned on demand, with regularity, to conceive, develop, produce, and market one technological breakthrough after another.

