Building General Electric

The discovery and early study of electricity took place largely outside the United States. The commercialization of electric power, on the other hand, was the handiwork of "the most useful American," Thomas Edison, whose inventions, engineering, and entrepreneurship fashioned a whole new industry. His killer app was the incandescent light bulb, which was joined by a new distribution system that allowed single sources of generated electricity to serve whole geographical areas. "When Edison ... snatched up the spark of Prometheus in his little pear-shaped glass bulb," German historian Emil Ludwig observed, "it meant that fire had been discovered for the second time, that mankind had been delivered again from the curse of night." Other Americans, such as George Westinghouse, filled in the gaps to solidify Edison's revolution.1

The new industry, soon to be one of the world's largest, had capital requirements well beyond what could be mustered up from ordinary Americans. The wealthiest in the largest cities provided the capital that built the railroads—and now did the same for electricity. Much of that capital came from Wall Street and the era's greatest banker, J. P. Morgan. The mighty General Electric (GE) emerged from Edison's early inventions, and more than a century later, it would be none other than GE that, as buyer and financier, picked up pieces of bankrupt Enron.

Thomas Edison had to be not only an inventor but also a businessman for electricity. But he was an undisciplined, erratic entrepreneur, requiring a

---

1. The early history of electricity is surveyed in Internet appendix 1.1, "Electricity before Edison," at www.politicalcapitalism.org/Book2/Chapter1/Appendix1.html.
confidant to attend to all the details necessary for profitability and growth. Enter Samuel Insull, a young Brit, who was Edison's financial fulcrum for more than a decade, after which Insull would go out on his own to become the leading name of the electricity industry for 40 years, eclipsing many others, including Charles Coffin the heavyweight first head of General Electric Company.

Prodigy

Samuel Insull, the youngest of five children of Samuel and Emma Insull, was born in London on November 11, 1859, the annum in which Samuel Smiles published Self-Help, the most influential book of Insull's life. The year also witnessed the discovery of the world's first commercial oil well, inaugurating a new energy era. Coal was the energy mainstay for homes and factories on both sides of the Atlantic, and manufactured gas from coal provided lighting in privileged locales. Petroleum would bring illumination to the masses and, several decades later, fuel the transportation age. Electricity would also come to the masses in time—thanks in part to Insull.

The lower middle-class Insulls were descended from "Children of the Soil," as Samuel himself would describe it. His mother, "one of the great influences in my life," was remembered as "a fine English matron whose main occupation in life was to keep 'the wolf away from the door.'" Samuel remembered his father as "a man whose ideals were more in his mind than his pocketbook." Both mother and father were leaders in England's temperance movement, a cause inspired by the demise of a family business from an ancestor's affinity for demon rum. Samuel himself would never take a drink, keeping a promise he made to his mother when he emigrated to the United States at age 21.

Samuel was very special. He inherited the best traits from both sides of his family: the toughness and discipline of his mother and the curiosity, imagination, and enthusiasm of his father. In his autobiography, Insull described himself as having a "combination of yeoman and 'white collar' blood" representative of the best of England—her middle class. He possessed a photographic memory and was barely aware that others might not have his capacity. ("Don't carry a notebook," he would say throughout his career. "Exercise your memory.")

Insull was a human dynamo. "He invariably awoke early, abruptly, completely, bursting with energy," wrote Forrest McDonald in his 1962 biography, Insull, "yet he gained momentum as the day wore on, and long into the night." Relaxation would never be easy, something Insull had to will himself into.

The temperance movement sent the family to Oxford, where Samuel received six years of private education from Oxford University students. He excelled at the practical things—basic mathematics, history, and political economy—but eschewed higher mathematics and philosophy. The classics interested him. This would be all the formal education that he would receive or need; a lifetime of dedicated self-study was ahead.
Samuel Insull developed a keen intuition of things and people. "Very early he learned to see to the heart of relations between things, or between men and things or men and men, and to grasp the underlying principles so clearly that he could perceive ways to shift them around a bit and make them work the better," McDonald wrote. Samuel could absorb and critically distill great amounts of information. His flexible, intuitive mind could bring order to virtually any task, small or large.

Figure 1.1 The Insulls circa 1866, with gleam-eyed young Samuel (far left). The prodigy applied boundless energy to his tasks, just one of his many positive traits. With parents Samuel Sr. and Emma (top) are, next to Samuel (left to right), Emma, Queenie, and Joseph. (Martin Insull was born four years later.)
Insull read inspirational books, particularly those by Samuel Smiles and took to heart the Victorian platitudes: *Idle hands are the devil's workshop. Things are simply "done" or "not done." An honest man is the noblest work of God. Time is money. Only that which is useful is good. Survival of the fittest and the devil take the hindmost. One never openly displays emotion, affection, or familiarity. And so on. Insull's moral, utilitarian, pragmatic view of life would guide him all his days.*

Insull entered the real world upon his family's return to London. With money scarce and his mother providing secret aid, the 15-year-old rejected his father's plea to enter the ministry and looked for work. A family friend, Thomas Cook, told him to wait a month to two for an opening at Thomas Cook & Sons, the tourist agency of international fame. But young Samuel wanted something immediately and found a position as office boy for a London auctioneer specializing in real estate. On July 1, 1874, the day after receiving the offer—five shillings per week—Insull began his 58-year business career, working from 9:30 a.m. until 6:00 p.m. weekdays and half Saturdays. His job? Licking stamps, delivering messages, and doing whatever other else an office clerk needed.

Insull survived some opening-day fisticuffs with an office bully (incidentally descended from the firm's founder), and occasional boot kicks and "big black ruler" swats in the office basement, to steadily advance over the next four and a half years. "I learned very quickly how very little I knew," Insull remembered, so self-help off the job was the order of the day. First came plain writing, which led Insull to buy a copy book and spend evenings "writing pothooks and handles." Next was stenography (Pitman shorthand), which "opened up for me the possibility of a career." Bookkeeping, again at night with purchased books and lots of practice, would round out this business education.

Samuel's growing talent landed him a night job as stenographer for Thomas Bowles, the editor of *Vanity Fair*, a popular weekly that introduced the youngster to the fascinating world of people, politics, and connections. A very modest sleep requirement (four to five hours per night) left plenty of time for everything else in the day—which in his case was either skill-based learning or work.

No moment was wasted. Insull read the great books while going to and from his jobs. To stay abreast of current events, Samuel joined the Literary Society of Christ Church, where he authored papers and gave talks, the latter of which "laid the basis of my acquisition of the power to think and formulate speech while standing on my feet and facing an audience."

A highlight came when Samuel persuaded P. T. Barnum, visiting from America, to address the group on publicity and promotion, an event that introduced the 18-year-old to the power of public relations. (Insull himself a few

---

2. Recounting the incident 50 years later, Insull told a packed room of his employees: "Never provoke assault. But if you have to fight, hit hard and hit to finish it quickly. Apply it to your brain as well ... to come out on top."
decades later would become "the link between P. T. Barnum and Madison Avenue" in his chosen industry.) When it came his turn to address the group, Insull happened upon a fascinating story in *Scribner's Monthly* about a rising American inventor who was the epitome of the self-made, practical man. The full story was found in the bookstores and libraries of London, and Samuel wrote an essay, "The American Inventor: Thomas Alva Edison."

**Breakthrough!**

Insull enjoyed these formative years despite an almost complete absence of leisure. Perseverance, broad skills, and innate smarts allowed Samuel to ace concurrent jobs and become the family breadwinner by the time he was 18. All his efforts, and his hard-earned skills in penmanship, shorthand, and bookkeeping, rewarded him well. Then his first setback came. At the conclusion of a positive year-end performance review, he was informed that his services at the auctioneer's would no longer be needed. A wealthy customer had arranged for his son to enter the business world and work for the experience, not salary. More than that, the blue blood would pay the firm handsomely. Insull's position was the one the articed clerk would take, notwithstanding Insull's four years of impeccable service at the firm.

The firing violated Insull's ego, which McDonald described as an "untouchable area," where "even a modest affront ... was unforgivable and unforgettable." But on this first Saturday of 1879, Insull saw a job posting in the *London Times* for a secretarial position with an American banker residing in London. Insull interviewed against dozens of other applicants and was hired for what was advertised (misleadingly, as it turned out) as a part-time position, to which he would add his two night jobs. He named his price too—50 percent more than he had been getting from the auctioneer.

On his first day at 6 Lombard Street, Insull received a second shock—this one of the best kind. George Gouraud was a banker as advertised, but he was also the European representative of Thomas Alva Edison of Menlo Park, New Jersey.

Before long, the 19-year-old became immersed in a race between the Edison Telephone Company and the Bell Telephone Company to introduce telephony in London. In a crisis moment, Edison became larger than life to the new hire. After Insull cabled the New York City home office that Bell was going to file a patent-infringement suit against Edison's telephone receiver, Thomas Edison replied that he would invent a new type of telephone receiver within 60 days. It was audacious, but Edison did just that. Insull now knew that he had to be at Edison's side and sought to learn everything he could about his hero.

---

3. Also see Internet Appendix 1.2, "Getting Fired: Never Letting Go," at www.political-capitalism.org/Book2/Chapter1/Appendix2.html.
Reviewing every document in the communication file in his spare time, Insull learned about the inventor's very promising electricity-lighting experiments in his Menlo Park laboratory, the very ones that had caused a "panic in gas shares" both in London and in Wall Street. Thomas Edison was a difference maker a world away.

At the same time, another letter of great import was being written, though one that Insull could know nothing about. In New York City, John Pierpont (J. P.) Morgan—assuming the mantle from his father, J. S. Morgan, as the world's leading investment banker—wrote a confidant about "a matter which is likely to prove most important to us all not only as regards its importance to the world at large but to us in particular in a pecuniary point of view ... Edison's Electric Light." Insull himself was just a few months away from seeing Edison's new light in a London basement. And the great J. P. Morgan would become a pivotal figure in not only Edison's but also Insull's future.4

Samuel Insull was at the right place at the right time, but he had made his own breaks by aggressively taking on new tasks and exceeding expectations. At his first job at the auctioneer, for example, Insull had become chief accountant, which included reconciling ledgers denominated in various currencies. In his new position, Insull soon found himself in meetings with London's finest businessmen and learning corporate finance, a brand new area.

But there was something else: Sundays and holidays spent with engineers at Edison Telephone Company on Victoria Street deciphering the technical side of Edison's operation and seeing "the first glimmer of an incandescent lamp, burning on about forty cells of Grove batteries." Insull, in fact, would be party to history as the operator for the first phone conversation outside the United States. Such was the 19-year-old's introduction to telephony, a new application of electrical engineering after the telegraph.

In the process, Insull befriended Edison's technical expert, Edward Johnson, by helping with experiments and by taking shorthand.5 Before long, Johnson's weekly reports to Edison on the European telephone situation were being

4. J. P. Morgan was the son of Junius Spencer Morgan, judged "the best business man in Boston" and the "ablest American banker of his day." In 1854, J. S. Morgan moved his family to London upon becoming principal of George Peabody & Co., the world's premier investment banking house. When George Peabody retired ten years later, the firm became J. S. Morgan and Company. Young J. P. apprenticed at Peabody in 1856 before moving to New York City, where he spent the rest of his career.

5. Forty years later Insull remembered: "I was willing to work, unlike the average boy of my age who wanted to be off playing cricket or rowing on the River Thames ... for the enjoyment of the moment than for that greater enjoyment which comes with the acquisition of knowledge."
prepared by Insull himself. It was ideal positioning, for Insull saw his future as working alongside Edison. Johnson returned home to America and Edison with just this plan.

Samuel Insull so positioned himself that in February 1881, just two years after finding himself on the London end of Edison’s activities, the 21-year-old got the call to come to America to be the inventor’s private secretary. Johnson had come through, and Insull was ready for Edison in the flesh. Besides, as Insull recalled decades later, “Things American had always interested me.”

Insull’s decision to steam 3,000 miles from Liverpool to New York City had risks. Edison had detractors, particularly among the top inventors in the electricity field. Untouched by his son’s enthusiasm, Junius Morgan of J. S. Morgan & Co., the leading investment house in London, was skeptical about this new form of energy. Insull left a high-paying job and a wealth of connections in one of the world’s two leading financial centers. He said goodbye to his roots—even his “parental roof”—not knowing when he would return. And now, with his reputation, Insull turned down another offer: to join Drexel, Morgan and Company in New York City.

The cable to come at once to America, sent by Edward Johnson, who had already returned home to the United States, did not include any explanation. An explanatory letter, it turned out, was delayed at sea. Yet Insull embarked on the 14-day, one-way voyage from Liverpool to New York. Said Forrest McDonald: “One of his most deep-rooted traits—one that derived perhaps from his energy, perhaps from his life history, possibly even from his body chemistry—was that he was absolutely unable, save on an abstract and purely intellectual level, to imagine the possibility of his own failure; he entirely lacked the sense of caution of those who doubt themselves.” Insull, McDonald continued, “could take huge risks without even realizing that he was gambling.”

But Edison needed Insull as much as Insull wanted Edison. Edison’s personal and business affairs were unorganized, even chaotic. The inventor’s own ways of doing things included a bookkeeping system charitably described as “peculiar.” Insull was ideally suited to bring a semblance of order, and the “private secretary and general business nursemaid” would not disappoint. Electricity was new, but


7. Insull soon knew why: “Edison was a man who knew not the hour of the day or the day of the week. His one idea was to work and work, and then to work more, on and on, until accomplishment was achieved.” Insull’s workday often included a “midnight luncheon” with Edison to update the inventor on the business day’s work. Fortunately, both Edison and Insull required only five hours, or less, sleep a night.
telephony was a good introduction, and Insull knew more than anyone else about Edison's European activities and how the inventor thought and worked. As Edison himself noted, Insull was as "tireless as the tides."

**Thomas Edison**

By the time Insull arrived, Thomas Edison (1847–1931), the eventual holder of 1,093 patents, had fathered the multiplex telegraph, stock ticker, talking machine (phonograph), improved telephone transmitter, and incandescent light. The photocopyer, alkaline battery, and motion picture projector would come later. Creating an industry to commercialize electric lighting, his most challenging and (in retrospect) greatest endeavor, was under way. More was going on with Edison than anyone, even the inventor himself, and much less Insull, knew. "As he invented a system of electric lighting," one biographer wrote, "Edison was simultaneously reinventing the system of invention."

Edison saw electricity as his "field of fields," giving him the opportunity to "reorganize the life of the world." It began with his study of arc lighting and his review of the gaslight industry in 1877/78, whereupon Edison became confident that he could economically subdivide the great beams of arc light.\(^8\) All this was scarcely work to the man who announced that he was taking a "long vacation in the matter of [electricity] inventions."

Edison would find many new uses for electricity in what he called "God Almighty's workshop," but it was never enough. "I am ashamed at the number of things around my house and shops that are done by ... human beings," Edison complained later in his career. "Hereafter a motor must do all the chores." But this required commercialization, commercialization required affordability, and affordability required efficiency. "Wherever man's power or horsepower can be eliminated," he would say, "speed, accuracy, and economy are the result."

Edison's range and quantity of discoveries set him apart from most other great inventors, such as James Watt (steam engine, 1769), Eli Whitney (cotton gin, 1793), Samuel Morse (telegraph, 1844), and Alexander Bell (telephone, 1876). Edison's genius combined theoretical comprehension, knowing what came before him, and intuiting from his special analogical powers—and old-fashioned hard work. Samuel Insull, who knew Edison better than anybody—and maybe better than Edison himself, at least when it came to electricity—remembered the

---

\(^8\) Pre-Edison arc lighting was inefficient and costly and produced uneven outdoor illumination. Edison's task was to discover how to subdivide light: as he said, "not to make a large light or a blinding light but a small light having the mildness of gas," as well as to create economical ways to produce and transmit electricity to displace coal gas, coal oil, and petroleum lighting.
inventor’s tremendous enthusiasm for work, the brightness and magnetism of his eyes, his patient teaching, and kindness and simplicity of manner.

Edison, the man seemingly without a nervous system, could work around the clock in the heat of discovery.9 “Putting off a thing until tomorrow was a practice unknown to Edison,” remembered one of his lab assistants. Edison himself stated in an 1898 interview: “For fourteen years I have worked on an average of twenty hours a day.” Edison defined genius as “1 percent inspiration and 99 percent perspiration,” and he combined both with an ability to remember the thousands of things that did not work.

Innate intuition was a great part of it. Edison was not only a “marvelous experimenter,” Insull explained, but also a “wonderful guesser.” Insull never forgot how, during a tour of Chicago in the 1890s, Edison picked out what he thought should be the center of the city’s electrical infrastructure. It turned out to be just that spot decades later.

Edison was neither a theoretician nor an ivory-tower experimenter. He was a practical inventor, a homo economicus. “I find out what the world needs, then I proceed to invent,” he said. The market’s verdict was taken as his own. “I measure everything I do by the size of a silver dollar,” Edison said. “If it don’t [sic] come up to that standard then I know it’s no good.” He once complained about an assistant’s work at Menlo Park:

_We can’t be spending time that way! We have got to keep working up things of commercial value—that is what this laboratory is for. We can’t be like the old German professor who as long as he can get his black bread and beer is content to spend his whole life studying the fuzz on a bee!_

Edison’s utilitarianism made him the quintessential democratic, egalitarian capitalist inventor. But market verdicts would work against Edison too, something that tested his ego, a real problem area for him in his later career.

Money was a means and not an end for Edison during the fabled Gilded Age. Edison could not interrupt his work for leisurely pursuits; his (substantial) capital was for the next set of experiments or a machine for a new business. The newspapers described him as the “millionaire inventor”; Edison referred to himself as “machine-rich and cash-poor.”

Edison was a realist in search of underlying causality. Self-educated, he had devoured the writings of Thomas Paine, whose Age of Reason (1795) proclaimed: “The most formidable weapon against errors of every kind is Reason. I have never used any other, and I trust I never will.” Edison saw great possibility in science and discovery and, following Paine, one of America’s founding fathers,

---

9. Edison, mostly deaf since childhood, said: “I have no doubt that my nerves are stronger and better today than they would have been if I had heard all the foolish conversations and other meaningless sounds that normal people heard. The things I have needed to hear I have heard.”
had little time for the unknowable or chance. 10 “I never did anything worth doing by accident, nor did any of my inventions come indirectly through accident,” the one exception being the phonograph earlier in his career.

Edison paid little heed to his learned detractors, many of them university professors. Edison “was regarded by scientists as a sort of intruder, a revolutionist of an inferior stamp far below themselves,” explained Francis Jehl. “He set the old school aghast by his methods of research wherein, instead of following the traditional technique, he went direct to Nature and asked her the questions he wanted to solve.” The experts had determined that subdivided light was theoretically impossible, in fact, and the future was in arc lighting, pioneered by Charles Brush at home and Paul Jablonski abroad.

But these smartest guys in the room were lacking intuition, emotionally wed to their past work, and too focused on the impractical. This was a real loss, for Edison needed experiments, not verbal barbs. “All those who might have helped—the world’s [electricity] experts, such men as Joseph Swan, Professor Henry Morton, Conrad Cooke, and W. E. Sawyer—were unavailable, for they were busily engaged in thinking up reasons why Edison’s efforts were doomed to fail.”

Mathematicians got Edison’s goat, and those specialists on his staff were subjected to practical jokes to keep them grounded. “I can hire mathematicians, but they can’t hire me,” Edison would state. (Some years later, Henry Ford would say the same thing about professional historians.)

Edison had an intellectual side. He read newspapers and technical articles to stay abreast of new developments, part of his “voracious, even omnivorous, life-long” commitment to acquiring knowledge. Time was too scarce to read fiction. He did not talk about politics or religion, only business and technology—and briefly. Only in his moments of family time did he reveal his true spontaneity.

Edison cared little about appearances in his inventive prime. Louisville’s finest once held a banquet in his honor where Edison went missing soon after his arrival. An electrical problem had been brought to his attention, and he disappeared into the basement as the event went on, and his food grew cold. His fine dress gathered grease and soot, but he fixed the problem. The other electricians thought it “wonderful” that such a man cared more for his trade than the “frills and fancies” of the evening.

---

10. Edison said of Thomas Paine (and really himself): “His Bible was the open face of nature, the broad skies, the green hills. He disbelieved the ancient myths and miracles taught by established creeds ... but atheist he was not.” Edison himself would utter that “there’s an engineer—somewhere” at the sound of weather events.
Edison personified Julian Simon's "ultimate resource" of human ingenuity. Edison captured the essence of mind over matter with the observation: "From his neck down a man is worth a couple of dollars a day, from his neck up he is worth anything that his brain can produce." The great inventor did more to make energy the "master resource" (another Simon term) than any other single person, excepting James Watt, whose steam engine put coal to its greatest use, speeding the Industrial Revolution.

Edison went from inventor to entrepreneur-industrialist in the quest to turn his patents into consumer goods. He was a free-market capitalist, financed by the private sector to meet consumer demand. Only occasionally did he turn to the political means to further his ambitions, and it proved to be a mistake. Edison's tax-free earnings—at least until 1909, when the corporate levy began at 1 percent of earnings—allowed him to plow his profits back into his cash-needy lab and fledgling manufacturing operations. His skin was always in the game, and he invested for the long term.

Edison was less an agent of "Darwinian harshness" than he was a wealth creator working amid the "perennial gale of creative destruction." He was a Schumpeterian entrepreneur who earned and lost fortunes over his six-decade career. Joseph Schumpeter's "capitalist reality" worked for and against him. Electricity displaced lighting from kerosene and particularly coal gas, the latter being described as "barbarous" and "wasteful" inasmuch as it shed "almost entirely heat and only incidentally a little light." Far better, Edison proved, was burning coal to generate electricity.

Electricity was not the total energy answer. A decade of toil by Edison to create a battery to make electric vehicles the transportation mode of choice was felled by Henry Ford's Model T with its self-starting internal combustion engine. To some, such "Darwinian harshness" was part of a flawed social system. Yet it was simply consumers rewarding good entrepreneurship and penalizing bad. Thomas Edison had himself to blame for his business failures, but overall, the Schumpeterian force that he released advantaged consumers and raised productivity for a rapidly increasing population.¹²

Edison's inspiring vision for the future made him an ambassador of the phenomenon of rising expectations. A popular song of the time jingled about an Edisonian future of electric horses, electric dinners, electric brooms, and police with "electric feet." Edison saw how new uses of energy—powering projectors, cars, or many other things—had made people restless with the status quo. Dissatisfied people invent progress, he explained.


¹² Creative destruction as a driver of capitalist progress is discussed in Capitalism at Work, pp. 126-30.
Figure 1.2 Incandescent lighting began Thomas Edison's quest to invent a new industry (left panel). The drawing of the inventor at work is cornered by (clockwise from upper left) the darkness of the past, the light of the future, the spellcaster of old, and the gas-stock panic created by Edison's breakthrough.

Edison was a folk hero whose wisdom educated and delighted three generations of Americans. He gave capitalism its best face. Matthew Josephson's *Edison: A Biography* (1959) was as positive as his *Robber Barons* (1933) was negative. Part of it was the different subject matter; part was Josephson's own maturity, writing in a climate more favorable toward American enterprise. 13

A poll by the *New York Times* in 1922 identified Thomas Edison as the greatest living American, ahead of industrialists Henry Ford and John D. Rockefeller,

---

13. For a critical review of Josephson as a muckraker historian, see *Capitalism at Work*, pp. 148-53.
politician Woodrow Wilson, and others. The same paper estimated that nearly $16 billion ($200 billion in today’s dollars) of enterprise value came from Edison’s inventions. *Life* magazine in 1997 chose Edison as “The Man of the Millennium,” ahead of such icons as Christopher Columbus (#2), Martin Luther (#3), Isaac Newton (#5), Thomas Jefferson (#10), Albert Einstein (#21), and Adam Smith (#74). Such lists are open to debate, and higher weighting was probably deserved by the earlier giants who paved the way for so much that followed. Still, there can be little doubt: Young Samuel Insull had hitched his wagon to the star of stars.

“Financial Factotum”

Insull’s arrival at New York harbor on February 28, 1881, was perfectly timed. Edison had completed his incandescent light at Menlo Park. Much work was under way with lamps and electric generators to offer a complete, affordable product to the marketplace. In 1878, New York financiers had capitalized The Edison Light Company (Edison Light) at $300,000 to undertake these experiments in return for the right to own and license the resulting inventions for five years. The intent of Edison Light was not to commercialize the inventions but to collect royalties from others who did, in order to fund Edison’s continuing laboratory work.

Just months before Insull arrived, the Edison Electric Illuminating Company of New York (New York Edison), the company now known as Consolidated Edison Company of New York, or ConEd, was created to underwrite the construction of a single station to generate electricity in bulk and serve a section of New York City. Edison and investors were confident that the facility would prove superior to both arc lighting and gas lighting.

Insull found Edison at his inventive best, which historians date from about 1873 to 1883, when Edison was age 26 to 36. Fifty-nine patents in 1880 would be followed by 259 in the next three years, almost all in electricity. Edison was also a gifted engineer, laboring to install his grand electrical system to show the world that gas lighting had been superseded by something much better.

Insull disembarked at dusk and went immediately to Edison’s new offices at 65 Fifth Avenue, an address beautified by electricity. The first meeting was eye-opening for both. Edison was surprised at how young Insull was (21) and looked (younger)—all five feet eight inches, 117 pounds of him. Insull’s “hero of my imagination” was disheveled and “looked nearer fifty than he did thirty-four... indicative of the work he had gone through in burning the midnight oil.”

14. Edison has been christened the “original nerd” for his “shabby appearance, strange sleep cycles, and bad eating habits.” But there was also, Insull remembered, “the wonderful intelligence and magnetism of his expression, and the extreme brightness of his eyes.”
Figure 1.3 “I had expected to find a man of distinction,” Insull (right) reminisced on his meeting with Edison (left) at the 65 Fifth Avenue building (center). Insull’s surprise at the “careless” appearance of his new boss was matched by Edison’s astonishment at the “boyish” look of his new private secretary. Nonetheless, Edison entrusted his business affairs to his protégé as indicated by this 1883 power of attorney.

But it was all business, exhilarating and nonstop, beginning with the first all-nighter. By morning, Edison himself was in awe of the youngster who had quickly sized up the prospects for raising $150,000 of European capital in such centers as Amsterdam, Berlin, Budapest, London, and Paris to help finance the commercialization of Edison’s lighting experiments—a plan that Edward Johnson took to London and executed. “From that moment on,” for 11 years at least, biographer McDonald noted, “Insull was Edison’s financial factotum.”

Edison’s battle cry was “factories or death!” Incandescent lighting and his early work on dynamos were one thing; inventing the components for an

15. “That was the condition during all the years that followed,” Insull testified at trial 53 years later. “I found everybody in that business needed money.”
integrated electricity system—boxes, cables, filaments, fuses, insulators, junction boxes, meters, regulators, sockets, switches, voltage regulators, wires—was quite another. Businesses needed to be created to manufacture, market, install, and service the new products. Customers had to buy them. His operating system, in short, had to be superior and affordable.

Capital was lacking. The half-million dollar—and growing—commitment to Edison Light and to New York Edison for experimentation and demonstration had not produced any profits (New York Edison gave away its electricity in its first months). The investors were wary of jumping into the more expensive manufacturing of products that had never before been seen, much less marketed. J. P. Morgan and his banking firm were in the habit of lending money against solid collateral, not anticipations. Edison and his top executives—such as Charles Batchelor, Edward Johnson, John Kruesi, Francis Upton, and Sigmund Bergmann—had to invest personally and retain profits to fund their operations. Permission from, and royalty payments to, Edison Light were required under a master contact that Edison called the "leaden collar."

Figure 1.4 Thomas Edison's "star assistants," along with Samuel Insull (middle with Edison), included (clockwise from upper left): G. P. Lowrey, who brought Wall Street to Edison and later became the inventor's top legal representative; F. R. Upton, chief mathematician and head of Edison Lamp Company; John Kruesi, chief mechanic and head of Edison Electric Tube Company; Sigmund Bergmann, founder and head of Bergmann & Company; Edward Johnson: top engineer, European "prophet," and future president of Edison Light Company; and Charles Batchelor, head of Edison Machine Works before Insull.
That first night, Edison asked Insull something else: Did he know bookkeeping, and could he set up an accounting system for Edison’s new incandescent lamp factory at Menlo Park? Insull replied in the affirmative and did just that. Before long, Edison made Insull secretary for three new businesses: Edison Machine Works, which manufactured electricity-generation equipment; Edison Lamp Company, which produced and sold lamps; and Edison Electric Tube Company, which built and installed underground distribution facilities. Insull also had responsibilities for Bergmann & Company, one-third owned by Edison, which manufactured telephonic, telegraphic, and electricity devices.

Thomas Edison disliked board meetings; now, with Insull in charge, he no longer had to worry about attending them. The 22-year-old would soon be Edison’s chief financial officer and given Edison’s power of attorney. “He trusted me with his affairs when I was just a boy,” Insull fondly recollected decades later. More than that, the great inventor personally trained his prodigy in science and engineering.

These aforementioned companies were “the acorn out of which the vast oak of the General Electric Company was to grow.” The commercialization phase was next, and it would involve a second generation of Edison pioneers, including Samuel Insull.

Thomas Edison confidant Alfred Tate remembered his first impressions of the boy-man the boss fondly called Sammy:

His mind was much older than his years would indicate.... He possessed unusual intuitive judgment in the affairs of business which compensated largely for his lack of experience.... He had a deeply sympathetic nature, but like all Englishmen did not wear his heart on his sleeve. His devotion to business almost constituted a religion. He permitted nothing to interfere with his duties toward the interest he was handling.

Insull’s predecessor handled the mail and appointments; Insull redefined the position by taking charge of Edison’s business side as well, not to mention aiding in experiments and troubleshooting in the field. Insull was agreeable, reserved, empathetic, and honorable—and focused, demanding, and addicted to work and strong coffee. Though always pleasant and appreciative of the rank and file, Insull was a tough taskmaster: He demanded attention to detail, execution, and all the other things behind maximum effectiveness. Insull fussed at sloppy work, as Alfred Tate, his successor as Edison’s private secretary, would find out. Praise from Insull was not direct but disseminated from third parties. “[Insull] seemed to think that sustained criticism was the most effective spur towards efficiency.” Tate recalled.

Insull was proper in all matters of appearance and manner and generous toward his friends. He was supremely loyal to Edison, developing a trust that permitted Edison to accept a systemization of his activities. Being the boss’s favorite helped the smallish, funny-talking import to blend in with Edison’s motley crew of scientists, technicians, engineers, mathematicians, and just
plain tinkerers. So did Insull’s work habits, his day spent on business and his night on engineering, often one-on-one with Edison himself. The crew also found out that Insull could play rough, a trait left over from his hard knocks as a London office boy.

Insull had endured seasickness on the boat and homesickness in America, but his confidence about making the right choice cured all. A letter sent home to London just two months after his arrival painted the following picture:

His lamps last about 400 hours.... As for rivals, Edison has but little fear, in fact, none from them.... Menlo Park is practically abandoned.... We have large gangs of men wiring the houses [in Manhattan] in anticipation of the time when we can lay our mains, erect our dynamo machinery and light up....

To carry out the gigantic undertaking of fighting the gas companies we have much to do. A great difficulty is to get our machinery manufactured. This Mr. Edison will attend to himself....

I have gotten right in with Edison, sit in the same room with him, assist him in everything.... People say that he likes me very much; but time must be left to prove this. I am absolutely satisfied that I did the right thing in coming here.

The blossoming “wunderkind” exhibited other traits of note given his future career and ultimate fate. Insull seemed overly sure of himself at times. He was big on appearances, reflecting an “exaggerated sense of propriety” that stemmed in part from an ego that always remembered and never forgave. Insull welcomed debt as a means and an end, whether purchasing a machine for Edison or a business suit for himself. Alfred Tate noticed something else: how Insull “loved power and glorified in the exercise of authority.”

J. P. Morgan

J. P. Morgan (1837–1913) was a towering figure in the formative period of American finance. Well descended, smart, in-the-know, decisive, and a master of the spoken and unspoken word, he seldom failed in money making or in negotiations to get to that point.16

Taking “to finance like a cat to cream,” young J. P. apprenticed at his father’s London firm, J. S. Morgan and Company, before moving to New York City and founding J. Pierpont Morgan and Company in 1862. A year later, a new partner changed the firm’s name to Dabney, Morgan & Company. After a decade of strong money making and experiencing some health problems, the 34-year-old Morgan contemplated dissolving his firm and retiring. But an offer from Anthony Drexel of Philadelphia’s prestigious Drexel & Company led to a new partnership in 1871: Drexel, Morgan, and Company. With the collapse of the

16. Also see Internet Appendix 1.5, “J. P. Morgan,” at www.politicalcapitalism.org/Book2/Chapter1/Appendix5.html.
Philadelphia banking house Jay Cooke & Company two years later, Drexel Morgan became the preeminent investment banking house in the country.

J. P. Morgan & Co. was formed in 1895, two years after the death of Anthony Drexel. In its long and storied history as America’s top banking firm, the so-called House of Morgan “spawned a thousand conspiracy theories and busied generations of muckrakers.”

To his critics, Morgan was a quick-buck artist and the robber baron of finance. Did not President Theodore Roosevelt glare at Morgan while speaking of the “malefactors of great wealth”? But Morgan was a driver of capitalism, channeling scarce capital to its most highly valued uses at a time when the demand for scarce capital was unprecedented, and winning bets turned luxuries into necessities for ordinary Americans. Pragmatically making money off the government, Morgan was a political capitalist too."

Morgan was neither a fool nor a short-terms. “Men had learned that he was decisive, intelligent, and swift of action, and above all, he kept his word,” stated one historian. He possessed an eagle eye for detail and prided himself on knowing everything about his business. Morgan was little interested in anything but results. If Morgan had been alive in our time, the post-1996 Enron would have been his least-favorite company. He would have been one of the few to say: I cannot invest in a company I do not understand.

Edison Light had been financed in 1878 by several top executives from Western Union Telegraph Company, a firm that knew Edison well from his inventions, as well as Drexel, Morgan and Company. William Vanderbilt, the world’s richest man from his inheritance from father Cornelius, the steamship and railroad tycoon, was another early subscriber. Young Vanderbilt was the nation’s leading investor in coal gas companies but saw great potential in Edison’s light and wanted to hedge his bets. But J. P. Morgan was the invisible force, making sure that his company was both represented on the board and in charge of the banking business of the new company—and Edison personally. Drexel Morgan also secured rights to Edison’s European patents by early 1879. It was unprecedented for an inventor to attract such a who’s who of Wall Street, but Edison was no ordinary inventor.

In 1880, New York Edison was funded to generate electricity for lower Manhattan, including the offices of Drexel Morgan. Two years later, J. P. Morgan persuaded his father to have J. S. Morgan & Co. underwrite a similar Edison venture in London. By 1883, J. P. was hosting Edison Light board meetings in

---

his office and had a standing order at his firm to personally buy one share of Edison stock for every share sold to an outsider.

"Living well mattered to Morgan as much as doing well," a biographer wrote about the man who would define his era in American finance. One luxury J. P. could not do without was electric lighting. Morgan wired his Madison Avenue mansion with Edison’s technology in mid-1882; for the fall social season, several hundred lights were on display for his many and honored guests.18 Visitors reveled in the novelty, which outshone everyone else’s lamps, whether they burned coal gas, coal oil, kerosene, as well as the traditional beeswax candles. Moreover, Morgan’s superior light was both simpler to operate and without smoke or smell—at least in the house.

---

18. J. P. Morgan’s residence was the first to sport electricity only because William Vanderbilt’s wife, in Edison’s words, “became hysterical” after learning that she was living above a boiler. The Vanderbilt’s system was dismantled soon after it was operational.
Morgan installed lighting controls in each room and had a bedside master switch ready to spook an intruder. There would be no burglars, but there would be complaints from neighbors who chafed at the vibrations and racket from Morgan’s coal-fired electricity generator and were downstream from its fumes and smoke. Electricity’s first environmental problem was resolved when mats and sandbags stilled and quieted the machines and an exhaust line was built to the mansion’s master chimney.

Morgan relished his electric light and worked to substitute electricity for coal gas at his business, his church, and a local school. “Pierpont sent [Edward] Johnson around with his mechanics and electricians, in the same way that he would send a basket of his best peaches or grapes,” the financier’s brother-in-law wrote. Edison’s top publicist, however, was paying royally for his indulgence. An engineer had to be present whenever the home generator was on, and mishaps were likely to occur, none greater than a short circuit that set fire and ruined Morgan’s library. Moreover, what Edison promised in “weeks” back in 1878—royalties from his inventions—took years, leaving Morgan without an appreciable return on his investment.

**From Dynamo to Jumbo**

Commercial electric lighting needed more than Edison’s candle. Electricity itself had to become more affordable, which meant generating more electricity per horsepower input. Edison’s crash effort to improve on-site electrical generators was largely accomplished by 1879, although it would be more than two years before the Edison Company for Isolated Lighting (Isolated Lighting) was formed to tap into the lucrative **dynamo** market. But this was not the answer, Edison felt. Something new was needed to “make electric light so cheap that only the rich will be able to burn candles.”

Edison saw the future in **jumbo** generators (named for P. T. Barnum’s circus elephant, Jumbo), as opposed to on-site dynamos, many of about eight horsepower. By wintertime 1880, his inaugural “Central Station” at Menlo Park (New Jersey) lit the laboratory and neighboring residences as well as powered the machines.

The construction of six-ton, 200-horsepower units came next at Pearl Street Station, located at 257 Peal Street in lower Manhattan. The first commercial electricity station, and the prototype for what would become the entire power-generation industry, began operation in September 1882. Each 100 kilowatt unit was capable of lighting 1,200 lamps versus the Menlo Park unit’s 50.

One of Pearl Street’s coal-fired units lit 900 dwellings in the First District of New York City, a one-square-mile area that included Wall Street and Drexel Morgan’s 106 lamps. The newspapers pronounced Edison’s grand demonstration a success. “The dim flicker of gas, often subdued and debilitated by grim and uncleanly globes, was supplanted by a steady glare, bright and mellow,”
the New York Herald reported. The New York Times, lit by 52 Edison lamps, described electricity as “soft, mellow, grateful to the eye; it seemed almost like writing by daylight.” Edison himself exclaimed, “I have accomplished all I promised.” But this was a long four years after he had told the New York press, “I have it now!”

But as one historian put it: “Seldom has the dawn of an age been so well heralded, and seldom has the morning after been so anticlimactic.” Applause aside, Edison was in the gales of his own creative destruction. Pearl Street, a technical marvel, had cost more than twice the amount estimated, not a good way to inaugurate a national sales effort. J. P. Morgan’s house had needed a complete rewiring before his lights could be turned on. Outlays accumulating, Edison’s backers favored incrementalism over revolution. Just as Edison rejected arc lighting, the first technology that introduced electricity to the public, he now tabled his new, improved dynamos despite a waiting market, committing fully to central stations. His board of directors, tiring of their recalcitrant
genius, imposed a “go slow” policy for Edison Light “until [electricity’s] practicability, economy, and profitability had been fully established.”

Edison could only complain about “the characteristic timidity of capital.” After all, wasn’t Morgan saying no to jumbo manufacture at the same time he was saying yes to bigger railroad projects? Yet other investors were not venturing in where Morgan was not, and Edison was dabbling in other ventures—unprofitably—when his full attention and dollars were needed in electricity.19

Still, few doubted that Edison had a good product. Pearl Street would turn profitable by 1884, and central stations in Appleton, Wisconsin, and Milan, Italy, proved economical too. Samuel Insull, in his later speeches, would marvel at how Edison’s light was profitable in a few years compared to the decades it had taken coal gas.

Two Thomas Edisons were needed: one for incremental improvements and the other for revolutionary advances. After “tremendous pressure,” Edison got his dynamo business turned around. Edison Light president S. B. Eaton, a Morgan confidant, proposed to buy out Edison during the “go slow” period, but the inventor refused and discussions ended in early 1883.

**Edison Construction Department**

With Pearl Street operational, Edison called on his own resources to create a new company to sell central stations to the market. In 1883, Edison tapped the 23-year-old Insull to run the Thomas A. Edison Construction Department. The business proposition was for cities and towns to commit between $50,000 and $250,000 for Edison Construction to install a jumbo to serve residences and businesses. Each of the local distribution companies (LDCs) would pay royalties to Edison Light and use the Edison name. The central-station proposition also benefitted from the inventor’s new three-wire transmission system, which increased affordability and range by reducing copper requirements by two-thirds. What Edison called the pole-connected “village business” helped “place electrical service within the limit of every purse.”

When Insull hit the road in 1883 with his turnkey proposition, there were precious few central stations compared to hundreds of dynamos (many of Edison origin) installed around the country. Insull’s task involved not only economics but also politics. Regional lighting required a franchise from city fathers, and areas served by a gas company were difficult to legally penetrate. In virgin areas, special favors to politicians were often necessary for a permit.

Still, Insull was selling a good product. Jumbos built by Edison Machine Works and installed by Edison Construction Department created Edison LDCs in New York, Massachusetts, Ohio, and several other states. Profitability was in

---

sight. But off-the-top royalties were flowing to Edison Light at a time when every dollar was needed to expand production to meet demand. Quality control became a problem. "Trouble shooting without end" at some locations inspired customers to rename their contractor the "[Edison] Destruction Department." Many LDCs struggled with cash flow and had a problem servicing their notes to Edison. Taking payment in stock in the new companies left Edison Light Company with an illiquid asset in many cases. Cash-flow problems led Edison to liquidate Edison Construction in the spring of 1884, just short of its second anniversary.

Edison and Insull hit bottom. Personal resources depleted, badgered by overdue bills, and reduced to dining on credit at their beloved Delmonico's, Edison remarked to Insull late one evening: "This looks pretty bad. I do not know just how we are going to live. I think I could go back and earn my living as a telegraph operator. Do you think, Sammy, that you could go back to earn your living as a stenographer?" As Insull stated decades later: "That was the only time I ever saw that man lose courage."

A worse outcome for mankind, or a greater violation of the economic law of comparative advantage, could hardly be imagined! About then, however, with business improving and accounts receivables coming in, the crisis was weathered. Such a financial nadir, last experienced at Menlo Park years before when Edison had to bribe a sheriff to dodge a foreclosure order, would not be experienced again. Still, capitalization remained a problem in light of Edison's own foibles, as well as his refusal to merge Isolated Lighting, in whole or part, with Edison Light. Another problem was personal. The death of his wife, Mary Stilwell Edison, in August 1884 led to months of mourning and a loss of interest in his work in electricity, if not in invention itself.

**Edison Light Company**

It was Insull's job to oversee the operation of the companies and manage cash flow. A major issue was the six-year-old royalty/license arrangement with Edison Light Company, whereby different pricing and production strategies could advantage one Edison-related company at another's expense. Yet integration by merger was not an option. At Edison's instruction, Insull mined, and even gamed, the contracts to minimize payments—at least until Edison Light's Eaton dressed him down. Insull had not been this humbled since his sudden firing years before as a London lad, and such began his lifelong animosity toward New York City financiers and the House of Morgan in particular, a row that would cost him dearly late in his career.

An upturn by mid-1884 led to a proposal by Charles Coster, the Morganite treasurer of Edison Light, to purchase 40 percent of Edison Machine Works, Edison Lamp Company, and Bergmann & Company on terms that one historian described as "to a large extent favorable to Edison and his manufacturing partners." Yet Edison, distraught over his wife's death, antagonistic toward his
investors, and possessing an inflated vision of what could be accomplished on his own, refused to dilute his ownership. It then became Insull's job, once again at Edison's urging, even through "devious means," to accumulate enough proxies from the minority stakeholders to give Edison majority ownership and thus control.

Morgan, whose interest was now subordinate to Edison, quietly watched as a new team was installed, with Eaton demoted to corporate counsel. Insull gloated in a private letter, "There is no one more anxious after wealth than Samuel Insull, but there are times when revenge is sweeter than money." Perhaps Edison gave it to him, or perhaps it was inbred in his own sizeable ego, but Insull and Edison shared a common virus within their genius.

Royalty payments were now in the family with Edison Light in hand by the close of 1884. But the capitalization problem remained because the parent held illiquid and mostly non-cash-generating LDC stock. Antagonisms were created with Drexel Morgan, including Charles Coster, whose merger proposal had been rebuffed. Competition was also heating up, which led to a decision in 1885 to vigorously litigate to uphold Edison's patents. The "seven years' war" was now on.

The year 1886 was eventful for Edison and the burgeoning electric industry as a whole. Central-station electricity boomed. Jumbos, complemented by Edison's three-wire transmission, proved formidable to capture markets for entire square miles. Streetcars created a huge new daytime market for electricity, one that soon exceeded lighting demand. By 1889, some 180 electric-streetcar systems were operating or under construction across the United States, compared to fewer than 10 just 18 months before.

Edison himself worked on electric streetcars between 1879 and 1882, financed by railroad entrepreneur Henry Villard. Sensing opportunity, Edison Light purchased a one-twelfth interest in Sprague Electric Railway and Motor Company. The daytime-intensive traction demand was putting the generating plants to work during what had been the slowest hours of the day, improving central-station economics.

By 1886, Edison Light Company had a presence in major cities in the United States, Europe, South America, and Japan, with 500 dynamos and 330,000 lamps on the books. Jumbos had increased to 58 from a dozen in just two years. Total assets were $10 million (about $125 million today), and more profits were registered in this year than in all prior years combined.

But problems remained. The company was undercapitalized, and competition was accelerating. New entrants used alternating current (AC), which allowed central stations to serve a much broader area than did direct current (DC). AC was the first major electricity-related technology in a decade that Thomas Edison had not pioneered, and the once-progressive inventor put much of his operations at risk by not facing up to its commercial advantages.
Edison Machine Works

In 1886, Edison merged Edison Tube Works and Edison Shafting Company into Edison Machine Works. A piece of land was purchased in upstate New York and large buildings erected for 200 workers. But things were not going well, so Edison as 90 percent owner and Edward Johnson as head of Edison Machine Works jointly conferred and decided to put Insull on it.

"I have no authority," a surprised Insull told Edison when asked to go up to Schenectady.

"Well, that is up to you," Edison responded. "I don't want to interfere with the fellows up there. You just find some way of getting the work done. That is your job."

Insull commuted, studied, and reported back on the problems a month later. Edison knew who needed to be in charge. "Now, go back up there and run the institution," Edison demanded. "Whatever you do, Sammy, make either a brilliant success of it or a brilliant failure. Just do something. Make it go."

"That," Insull remembered, "was [my] first real independent opportunity in life." His initial position at Edison Machine Works as secretary-treasurer was upgraded within a year to general manager, the top position. Edison's other lieutenants had to adjust—though Kruezi cooperated with Insull more than did Batchelor—but there could be no doubt: Insull, just past his twenty-seventh birthday, was now Edison's top business executive. 20

Edison Machine Works relocated to upstate New York to improve labor relations. At the new plant, production of dynamos, jumbos, Sprague motors, and their many components were scaled up. Insull found himself on a steep learning curve on how to improve operations at one of the largest manufacturing centers in the world. The operation was very profitable, and Insull received a new pay package that rescued him from his persistent financial worries. Such was the topsy-turvy life with Thomas Alva Edison.

A booming market masked two problems: Edison's central stations were wed to DC transmission technology, and Insull was struggling to fund Edison Light and the inventor's other businesses. Insull was constantly taking 180-mile train trips between Schenectady and New York City to juggle short-term loans and survive on cash reserves under $10,000. ("Raising money is the hardest battle," Insull would state throughout his career.) Forrest McDonald described Insull's relationship with Drexel Morgan as "frantic, nerve-racking, and disgusting." One loan for $20,000 came with a 20 percent rate, almost unheard of in its time. This only added to Insull's antagonism toward New York bankers, despite the true source of much of the problem: Edison himself and the rigors of managing a start-up megabusiness.

---

20. Also see Internet appendix 1.8, "Insull: Edison's Top Business Executive," at www.politicalcapitalism.org/Book2/Chapter1/Appendix8.html.
Figure 1.7 Dynamos dated from the 1830s, but Edison and others made them cheaper and more powerful. The first dynamo at Edison’s research laboratory in Menlo Park (top) can be compared to a jumbo generator installed at Pearl Street in New York City two years later (below).

**Competition Maximus**

Artificial lighting was never a monopoly for any application or company. Coal-gas lighting was the first modern form of illumination in America, beginning in Baltimore in 1817 and extending to Boston, Brooklyn, New Orleans, and New York by 1835. By 1875, more than 400 gaslight companies blanketed
urban America, whetting the peoples' appetite for more and better lighting. Some of this appetite was met by kerosene lamps, which came of age in the 1860s with the rise of the commercial crude-oil industry. Coal oil also had a business—at least until petroleum came along.

The electricity age began with arc lighting. Brush Electric Company and American Electric Company, among others, introduced outdoor lighting in Cleveland, Niagara Falls, Philadelphia, and San Francisco by 1880. But the "blue moons" of arc lighting were no match for the "bottled sunlight" of incandescent bulbs, of which Edison was the inventor and first mover. "Edison's company is the only one actively in the field," it was reported in 1883. "It not only occupies the field, it comes near to filling it." Yet competitors were emerging, the first being United States Electric Lighting Company (est. 1878), which by 1885 had 80 stations versus Edison's 368. The upstart was not profitable and merged several years later into the company that would become Edison's most formidable rival, Westinghouse Electric.

In 1884, inventor George Westinghouse incorporated Westinghouse Electric & Manufacturing Company to pursue the incandescent-bulb market. Recapitalized at $1 million in January 1886, the renamed Westinghouse Electric Company began construction of central stations, using the AC transformers that he had helped perfect. Unlike DC, AC transformers could step up voltage to transmit power over greater distances with minimal losses yet also step down voltage to serve individual users. This allowed AC to bring electricity to a much larger population and at lower cost than to Edison's DC-based offering.

Within a year, Pittsburg-based Westinghouse Electric had 68 AC stations built or under way. One Westinghouse station in New Orleans went head to head against Edison's DC station, an early instance of wire-on-wire competition. Thomas Edison himself alternately marveled and fussed at the "ubiquitous" Westinghouse and his products.

---

21. Coal-gas lamps were what electricity sought to displace. See Internet appendix 1.9, "Electricity versus Manufactured Gas," at www.politicalcapitalism.org/Book2/Chapter1/Appendix9.html.

22. At age 22, George Westinghouse (1846–1914) designed an air brake allowing train cars to stop simultaneously (or nearly so). In 1886, he secured American patent rights to a high-voltage transformer developed abroad, which he improved with the help of William Stanley. The AC system was first installed in 1886; two years later, he secured patent rights to an AC motor developed by Nikola Tesla, a Serbian-American inventor. Westinghouse would receive several hundred patents in fields as diverse as electric signaling, natural gas pipelining, metering, telephony, steam turbines, heat pumps, and shock absorbers. He was in a rarified league with Edison as an inventor and proved to be a better (although fallible) businessman.
Westinghouse had a formidable competitor using AC, which meant that Edison had two. Thomson-Houston Company of Lynn, Massachusetts (est. 1883), branched out from arc lighting to Westinghouse-licensed AC central stations, with 22 such projects completed or under way by late 1887. Thomson-Houston had three strengths that allowed it to expand quickly and profitably: an able marketing-oriented leader, Charles Coffin; strong financing from Boston-based Lee, Higginson & Company; and a stream of new technology from Elihu Thomson, who in a five-decade career would be awarded 696 patents, among the most awarded to one man in the United States. Thomson-Houston also knew when to go to the outside, licensing Westinghouse’s alternating current in 1887 and purchasing seven companies, including Brush Electric, between 1888 and 1891.

Westinghouse and Thomson-Houston together were catching up with the mighty Edison Machine Works, which claimed 121 DC-dedicated central stations, built or under contract at the time. Thomson-Houston focused on what Edison did not—arc lighting, alternating current, and product variety—and became more profitable than the industry leader. But with cause, Edison came down hard on the upstart for patent infringement.

The AC boom was not surprising. DC stations had to be situated in the middle of their service territory and reached less than a mile in each direction. Checkerboarding at the edges left customers unserved. Once such a unit was situated, changing market demographics might require a new generator. AC stations covered square miles, and upgrades could meet new demand in any direction. AC transmission also used significantly less copper than DC, a savings that was magnified with the metal’s price spike in 1887/88. Also, the superior economics of AC was enhanced with a new motor invented in 1887 by Nikola Tesla, a “new titan” in the electricity field.

Edison resorted to a war of words, calling George Westinghouse a “shyster” and saying, “Tell Westinghouse to stick to air brakes.” Edison called AC purveyors “the Apostles of Parsimony,” a backhanded compliment. But the

23. At age 16, Elihu Thomson (1853–1937) was introduced to the new field of electricity by his high school teacher Edwin Houston, the man who later became Thompson’s co-inventor and business partner. In 1876, they invented a rudimentary alternating-current system that attracted investors, and their future work together “helped convert electric lights, generators, and motors from lecture-hall curiosities in 1875 to commonplace products in 1900.” Thomson was involved with three companies: American Electric Company (1880–83), Thompson-Houston Electric Company (1883–92), and, through merger, General Electric Company (est. 1892). Thompson was much more than “an excellent albeit not creative engineer” who positioned a “cowbird company, one that thrived upon the nests of others,” as Forrest McDonald claimed. Thomson, one of America’s great inventors, filled in gaps with electricity both during and after Edison’s active period.
market was speaking much louder than words, despite Edison’s reputation. “The tide would not turn back at his frown,” one historian noted.

Edison had one card to play: safety. AC voltage was more powerful and potentially lethal than DC. Edison also built his lines underground, a costly practice that gave his investors pause. Some high-publicity electrocutions from overhead AC gave Edison an opening to sway the public and, more important, the New York City Board of Electrical Control. Animals were “westinghoused” with lethal AC in public demonstrations at Edison’s direction. The public relations department of Edison Electric Light wrote a law for New York to use electrocution for capital punishment to scare the public about Westinghouse’s technology on the overhead wires. An elephant was electrocuted at Coney Island in 1903 for similar effect. But the effort to ban AC failed after it was documented that accidents with this technology were no more, and even less, than
with DC, not to mention other public hazards. Similar efforts by Edison (and Insull) to ban AC were also turned back in Virginia and Ohio.24

Just about everyone but Thomas Edison knew that AC central stations were the future. The Edison organization passed up the chance to patent European AC technology back in 1885, a mistake George Westinghouse capitalized on. A study by Frank Sprague commissioned by Edward Johnson, the president of Edison Light Company, supported entry into high-voltage distribution. One of Edison’s own, the inventive Nikola Tesla, quit and later sold his AC technology to Westinghouse.

Finally, with Westinghouse installing as much capacity in a month as Edison in a year, and with Insull pleading with other executives, Edison relented. Edison Machine Works entered the AC business by October 1890. The war of the currents was over.

The full shenanigans of Edison’s futile crusade will never be known. Insull described the period as “hundreds of stories of happenings which occurred before there were such things as Rotary Clubs and business ethics codes.” He thought it “best to let them die” to “avoid sullying Edison’s memory.” This early episode in the history of political electricity and, more broadly, political capitalism, would not be the last for Samuel Insull or for competing technologies.

Going Napoleonic

The Thomas Edison problem went beyond the battle of the currents. The inventor extraordinaire was going Napoleonic. Electric-train demonstrations in Menlo Park in 1880, 1882, and 1883, which Edison Light Company’s investors refused to support, were technological successes but economic failures. A spirited return to phonograph experimentation, which hit full stride in 1886, was another distraction of mind and money. Edison’s need for additional funding in this area led to a sequence of events that by 1888 caused “the first irreparable fissures in the proud, tightly knit Edison fraternity.” The “phonograph fiasco” would stretch out 20 years.

Edison’s “most consuming obsession” began in 1889 when he received a large payout from the new investors in Edison Light Company. His idea was to reduce the cost of iron via a separation process that could upgrade magnetic rock into high-grade iron ore, thus creating what he described as a “monopoly of one of the most valuable sources of national wealth in the U.S.” Edison’s iron-intensive inventions explained part of his interest. “This venture has all the elements of permanent success,” the inventor exuded. “All the factors are known.”

24. This foray of Edison and Insull into political capitalism is discussed in Internet appendix 1.10, “The ‘Battle of the Currents’ Revisited,” at www.politicalcapitalism.org/Book2/Chapter1/Appendix10.html.
“Edison’s Folly” was a ten-year mistake. Expenses north of $2 million (about $50 million in 2008 dollars) ate up his wealth and misdirected his inventive and engineering skill. Four hundred men were misemployed and then unemployed. The venture depended on iron ore priced between $6.00 and $7.50 per ton, yet new high-grade discoveries kept prices well below this range.

After reading a dispatch in 1899 that iron ore prices had dropped to $2.65 a ton, Edison disbanded his vast New Jersey/Pennsylvania operation. His iron ore milling process was a technological success, but revenues below cost could not continue.

Edison could have advanced arc lighting as his investors wanted him to do. He was late creating a new subsidiary, Edison Company for Isolated Lighting, to tap into another ready, profitable market; after ramping up in 1882, more than a thousand dynamos were built and operating six years later. Edison was also late with his patent infringement litigation, which would bear fruit in the next decade.

Edison’s Napoleon complex also worked against cost control. A new laboratory built in West Orange, New Jersey, capable of “build[ing] anything from a lady’s watch to a Locomotive,” was well over budget in 1887/88, which caused Insull to complain to the inventor’s new private secretary, Alfred Tate:

[Edison] wants a great deal more money than he at first anticipated, but this is simply a repetition of what has occurred so frequently before. The trouble is, that Mr. Edison does not have anyone with him who urges him to curtail his expenses on his new laboratory.

The good news was that Insull was now well away from the boss, affording him more managerial freedom to run Edison Machine Works. Edison was a micromanager, insisting on knowing minute details of his many enterprises before decisions were made. Edison for years spent too much time on trains going to his various enterprises, but the consolidation of 1886 and Edison’s new ventures outside of electricity got him away to his lieutenants’ benefit. Edison could have, should have, ceded greater control to his investors and concentrated on his strength: invention and engineering.

Thomas Edison’s greatest foe was not J. P. Morgan, Wall Street, George Westinghouse, Elihu Thomson, or Charles Coffin. It was himself. Despite all the positives, Edison had become a burden to Samuel Insull and his whole organization ever since 1884, if not before. Small wonder that Drexel Morgan and other potential investors declined to recapitalize the world’s greatest commercial inventor. Small wonder that Insull was able to handle Edison and excel at running a company—and one of the world’s largest manufacturing enterprises at that.

25. Also see Internet appendix 1.11, “Edison’s Strengths and Weaknesses,” at www.politicalcapitalism.org/Book2/Chapter1/Appendix11.html.
Edison General Electric Company: 1889–92

Enter Henry Villard, an up-and-down financer and backer of Edison’s earlier work with electric railroads. Armed with European capital, Villard proposed to consolidate Edison Light and Edison’s various shops manufacturing generators, lamps, and electrical devices. Sprague Electric Railway and Motor Company would become wholly owned, as would Edison’s Canadian subsidiary. Eight entities were merged, with their separate identities set to end the next year. Villard’s vision of creating a “world cartel” in electricity was exaggerated, but the benefits of consolidation, vertical integration, and scale economies were there. It would be a wise recapitalization/restructuring.

Insull favored the merger to address the capitalization problem. So did Edward Johnson, who told his boss, “We shall speedily have the biggest Edison organization in the world with abundant capital,” after which it would be “goodbye Westinghouse et al.” It was just enough to get Edison to go along.

J. P. Morgan set the terms, and Edison General Electric Company came into being in April 1889 with a par value of $12 million. Drexel Morgan placed the new stock with private investors, most going to Deutsche Bank because of Villard.

Edison General Electric earned $700,000 on sales of $7 million in its first reorganized year, a solid start. A good deal of potential earnings remained in stock held in and notes payable from LDCs serving Brooklyn, Boston, Chicago, Detroit, Philadelphia, and several dozen other cities.

Thomas Edison had his biggest career payday, receiving $1.75 million in stock (about $50 million today). “I have been under a desperate strain for money for 22 years,” he allowed. It was time to “free my mind from financial stress and ... go ahead in the technical field.” Edward Johnson retired wealthy, and Sigmund Bergmann would parlay his share into greater success in Europe. The Morgan group emerged with a market value of $2.7 million, a 350 percent return on its original investment. An investment that never paid dividends in more than a decade was finally well worth it.

The recapitalization provided much needed funds for expansion, and the 29-year-old Insull himself, $75,000 richer (about $2 million today), was appointed vice president in charge of manufacturing and sales, while continuing as Thomas Edison’s business manager. Villard was president, but Insull was to run the show—short of financing, which he did not want to do and probably could not humanly do. Both men were careful to consult with Thomas Edison on important business matters, yet the silent force was J. P. Morgan. He and Edison were still on top in their very different ways.

Back at the New York City headquarters, Insull had responsibilities for Edison Machine Works in Schenectady, Bergmann & Company in New York City, and Edison Lamp Company in Harrison, New Jersey. With virtually the whole organization beneath him, Insull centralized by creating seven regional sales offices: New England District (headquartered in Boston), Eastern District
(New York), Central District (Chicago), Southern District (New Orleans), Rocky Mountain District (Denver), Pacific District (San Francisco), and Canada (Toronto). Insull also established a central intelligence group at the parent home office, the forerunner to the strategic-planning division of national organizations to come.

Each district was under one manager responsible for sales, installation, and service. Insull visited these offices twice yearly. “Out of their work,” stated a history of General Electric Company published in 1941, “came principles of business administration and methods of financial accounting which persist today.”

Insull embarked on an aggressive growth strategy, with all products priced to sell. He retained all earnings, sold stock, and borrowed to the hilt. “Never pay cash when you can give a note,” Insull always said, “and then meet your notes promptly.” The formula was to spread fixed costs over more and more units, allowing him to lower prices to maximize market penetration. Electric lamps that cost a dollar in 1886, for example, cost half as much four years later. As Insull (and Edison) suspected, increased volume made up for lower margins per sale. Sales also increased demand for the other side: more lamps, more demand for generators; more generators, more demand for lamps. In a major policy change, Edison General was put on a cash basis, which meant less business but more cash flow and liquidity.

Insull treated his workers well. Stung by labor problems that precipitated the move from Goerck Street to Schenectady and empathetic toward the little fellow, Insull implemented progressive labor policies that later in his career would inspire the term Insullization.

Challenges remained. Capitalization problems led Villard to approach Morgan for a loan of several million dollars. Villard was less interested in manufacturing than in owning and operating central stations and streetcars. He envisioned a future wherein a self-integrated company would manufacture only for itself, part of a grand vision of one dominant firm. But Villard’s Morganesque view of consolidation over competition, not shared by Insull, compromised the company’s real strength: manufacturing. Villard’s policy of taking stock rather than bonds from LDCs meant less cash flow for Insull—hence the need for $3.5 million in new debt from Drexel Morgan. Edison General Electric was short of engineering talent, and Insull needed Edison working on arc lighting and streetcar systems, not phonograph improvements and iron ore milling. These problems could not be hidden in a market populated by formidable competitors, such as Thompson-Houston and Westinghouse.

---

26. As stated in Edison General Electric’s 1890 annual report: “It was found practically impossible to exercise over so many distinct organizations the close supervision necessary to secure rigid accountability and conduct the business on an economical basis.”
The Formation of General Electric Company (1892)

The early 1890s proved to be "the most competitive and tumultuous period in the history of the electrical manufacturing industry." In the autumn of 1890, London's Baring Brothers, the world's leading banking house, failed, tightening capital markets and depressing the value of the highly leveraged LDCs in which Edison General Electric had stock positions (totalling $6–$7 million in 45 to 50 firms). Internally, competition for the domestic central-station business was intense among the big three: Edison General Electric, Thomson-Houston Electric Company, and Westinghouse Electric. A dozen other companies had 20 or more central stations, and dozens more companies were advertising for the same business. This was quite different from a decade before, when Edison practically had the market to himself.

![Diagram]

**Figure 1.9** The growth of the Edison companies, consolidated as General Electric Company in 1892, is shown alongside the development of rival Westinghouse Electric & Manufacturing Company. In all, some 30 companies ended up as 2 over a quarter century.

Westinghouse, the most leveraged of the three and in the midst of an expansion, struggled to refinance its debt and faced the prospect of bankruptcy. George Westinghouse thought too little of Charles Coffin to merge with Thomson-Houston, which left Edison General Electric. As early as 1888–89, Villard, with Morgan's blessing, had been quietly talking to Westinghouse, considered a better merger candidate than Thomson-Houston because it was smaller and had AC patents.
The industry needed rationalization. Bids to install central stations were loss leaders, the builders betting on future parts business once their technology was locked in. Thomson-Houston, the most aggressive bidder, had more central stations by 1891 than Westinghouse and Edison combined. Thomson-Houston under Coffin was plenty profitable, one plum being a contract with the city of Boston to erect the world’s largest generating plant (two megawatts). To Villard, this was “ruinous” competition. Morgan could not have agreed more.

Villard’s hand was significantly strengthened when the courts ruled in favor of Edison’s infringement suits in mid-1891. Edison’s patents were set to expire in 1894, but the other companies could scarcely afford to stop manufacturing or pay high license fees during the interim. Consequently, Villard set his sights on the biggest prize, Thomson-Houston, in early 1892.

Villard traveled to Lynn for talks and took a tour but was told that Thomson-Houston was not for sale. A Morgan representative visited some months later and reported back that Thomson-Houston should be acquired. Soft business conditions in 1891 exposed excess industry capacity, suggesting a need for consolidation and cost cutting, and 60 patent suits between Edison and Thomson-Houston begged for a solution. Edison also needed the AC rights that Thomson-Houston possessed under its Westinghouse cross license. Edison General needed working capital as well.

As Morgan moved toward consolidation, Villard began to look shaky. The New York Times described Villard as “a strong talker” with “wonderful personal magnetism” but warned that “J. Pierpont Morgan … is a hard man to dazzle.” The planned takeover took a twist when Charles Coffin, perhaps bluffing, told Villard that he did not want to sell. “We don’t think much of the way the Edison company has been managed,” Coffin said, words intended to reach the kingmaker, J. P. Morgan. Morgan met with Coffin, who brought with him the financials for 1891, showing Thomson-Houston with a 26 percent return compared to Edison General’s 11 percent. Part of the discrepancy was that Edison’s LDC stocks were not generating income, whereas Thomson-Houston’s LDC bonds were.

Without warning to Villard or anyone else on the Edison side, Morgan set the terms of the merger by valuing Thompson-Houston at $18 million and Edison at $15 million. He selected the board accordingly. Henry Villard was informed that his “courteous resignation would be courteously received,” leaving Charles Coffin at the top of the merger that created General Electric Company. Edison had been “Morganized.”

Edison’s secretary, Alfred Tate, heard the news first and rushed to find his boss. When told, Edison turned “as white as his collar” before uttering, “Send for Insull.” But nothing could be done.

Edison had himself to blame for the turn of events. Who had been in the New Jersey highlands for two years upgrading iron ore rather than tending to the (premerger) Edison Light? Who had reduced his ownership position and told Villard as far back as 1890, “I feel that it is about time to retire from the
lighting business”? Edison had not attended meetings regarding the future of his namesake company; nor had he cultivated Wall Street and J. P. Morgan in years. Edison wanted glory in an industry that had now moved past him.

Insull professed complete surprise but supported the merger. No one knew more than he that capital was badly needed and that electricity was no longer Edison’s passion. Emotionally wounded, hearing rumors that Insull somehow was in the know, and suspicious about an offer made to Insull to join the new company, Edison turned on his business chief. It was the first major disagreement between the two in their 11 years.

No evidence of a conspiracy within the Edison group emerged. Alfred Tate, in his Edison biography, opined, “To anyone who knew Insull’s character as I did, that story is incredible.” Villard had kept his negotiations quiet and got unexpectedly ousted in the end. But that did not keep some of Insull’s enemies from starting rumors. Edison would back down from his accusation, but his spell over Insull was now broken.27

“Our orders were far in excess of our capital to handle the business, and both Mr. Insull and I were afraid we might get into trouble for lack of money,” a subdued Edison remarked on the merger. “When Mr. Henry Villard and his syndicate offered to buy us out, we concluded it was better to be sure than sorry, so we sold out for a large sum.” But the inventor’s ego was apparent when he told the New York Times:

I cannot waste my time over electric lighting matters, for they are old. I ceased to worry over those things ten years ago, and I have a lot more new material on which to work…. I simply want to get as large dividends as possible from such stock as I hold. I am not a businessman enough to spend my time at that end of the concern. I think I was the first to urge the consolidation.

Edison boasted to friends that he was about to do something “so different and so much bigger … that people will forget my name ever was connected with anything electrical.”

Villard, meanwhile, found a scapegoat for his ousting. “The impaired financial condition of the Edison Company, due to the extravagant management of Mr. Insull,” he stated, “made the fusion imperative.” Such was the indignity hurled at the man who had made Schenectady the most profitable part of Edison’s whole operation. Insull could only remember it as “the first great crisis of my career in America.”

27. Insull’s close friendship with Edison resumed and endured after the two broke off their business partnership in 1892. Insull gave many speeches on Edison, an excerpt of which is reproduced in Internet appendix 1.12, “Insull on Edison: Speech of March 14, 1926,” at www.politicalcapitalism.org/Book2/Chapter1/Appendix12.html.
The $50 million General Electric Company came into being in April 1892. "Edison" was dropped from the corporate name at the inventor's request, and Edison began liquidating his interest in the new company—a payout that would total $5 million ($100-plus million today). Insull was offered the position of second vice president in charge of manufacturing and sales, the number-three position at the whole company, at the substantial salary of $36,000.

Insull accepted—but only to see the merger through. Coffin's decision to merge Thomson-Houston's network into Insull's seven-district organization required Insull's best efforts to help position his side's 6,000 workers in the new organization. Thus, it was really Insull, not Coffin, who was behind what business historian Alfred Chandler called General Electric's "standard way of organizing a modern integrated industrial enterprise." This belied Coffin's claim that Edison General Electric was not well managed, something that hardly sat well with Insull, who waited many years before saying how, "to put it politely, some people helped me get out [of General Electric]." It was less Coffin's fault, however, than the real decision maker: J. P. Morgan.8

General Electric Company under Charles Coffin would have a bumpy beginning before settling into the "center firm" known today as GE. After a solid 1892, when more than two million lamps were sold under the company's monopoly patents, the Panic of 1893 forced the firm to suspend its dividend and turn to Drexel Morgan for help. But by 1895, with more than 10,000 customers and more than 100,000 orders, GE was again profitable and well capitalized, and General Electric would never look back. Board members J. P. Morgan and Charles Coster (Morgan's chief lieutenant) could be proud of their new company. Naysayers who challenged the firm's finances and Coffin's integrity, and those who predicted failure for "the electrical trust," would be proven wrong.

**Farewell, New York**

Why did a 32-year-old with future written all over him resign from a top position at one of the world's greatest companies? The first reason was Insull's concern about working for someone (a fast-talking former shoe salesman, no less) who, he believed, knew less than he did about electricity.9 Never mind that Charles Coffin was the president of General Electric and consequently the most powerful

---

28. "I guess [J. P. Morgan] thought that I was not sufficiently live enough kind of material to run the job, and so another man was made president," Insull would say decades later. Elsewhere, Insull allowed: "I really was one of the 'outs' in this new organization, and I made up my mind to branch out for myself, although it involved severing my personal [business] relations with Mr. Thomas A. Edison."

29. In his memoirs, Insull revealed how his early antagonism gave way to a close friendship with Coffin, a man whose "marvelous grasp of the business" propelled General Electric and the whole central-station business.
man in the industry—and someone Insull would come to regard as “a man of probably the greatest vision” of anyone in electricity manufacturing, excepting, of course, the industry’s founder, Thomas Edison.

Second, leaving General Electric allowed Insull to break as cleanly as did Thomas Edison, his still-beloved mentor. (This also ruled out working for Westinghouse, the company that Thomas Edison so disliked in competitive battle.)

Third, Insull did not believe that General Electric was sufficiently focused on central stations as the future. Insull saw a better future in generation and distribution (the utility side) than in manufacturing, although he was not interested in the vice presidency of North American Company offered by Henry Villard. (Villard, who controlled the company that operated electric utilities in Milwaukee and Cincinnati, would apologize to Insull for his earlier criticism.)

Insull, in short, was ready for his own show—one that would be potentially bigger in scope than the business he was leaving, although still in the same industry. Moreover, he had an intriguing opportunity to pursue.

Chicago Edison Company, an upstart just two years into paying a dividend, needed a new president after the resignation of E. T. Watkins in 1891. Insull, who had handled its account for Edison General Electric, was asked by Edward Brewster and Byron Smith, two prominent members of Chicago Edison’s strong board, for recommendations. The smallish company dared not ask Insull himself to take the position; with less than half of the embryonic lighting load in its city, Chicago Edison’s capitalization of $883,000 was about 2 percent that of General Electric, where Insull was the number three. Moreover, the new president of Chicago Edison would command all of 300 men, whereas Insull had commanded 6,000 at Schenectady.

But Insull thought differently. Edison himself had identified Chicago as the ideal market in waiting, and Insull coveted the top job instead of a near-the-top job. It meant taking a self-imposed salary reduction and relocating to a city that was less to his liking. (He bound himself to a three-year contract—the only time he ever set a term—in order to not let himself venture back East.) It meant choosing generation/distribution over the (hitherto) more profitable manufacturing side of the electricity business. But his visiting mother urged him to take it after he explained his options. So, on the same day that General Electric assigned him the number-three job, Insull wrote letters to Brewster and Smith offering his candidacy. The 32-year-old realized that he was taking over a small company, but he also knew how he could consolidate the Chicago electricity market as a platform for greater growth.

The Chicago Edison board was surprised and pleased. Little vetting was required. Thomas Edison’s unreserved “yes” was about all the board needed.

So once Insull got his conditions from his new board—an increase in capital, construction of a large new generating plant, and the promise of ample capital to consolidate the Chicago market and internally expand—he was elected
THE ORGANIZATION OF THE 
GENERAL ELECTRIC COMPANY
1892

Executive Officers
Charles A. Coffin - President
Eugene Griffin - First Vice President
Samuel Insull - Second Vice President
Frederick P. Fish - General Counsel
E.I. Garfield - Secretary
Benjamin F. Peach, Jr. - Treasurer

Board of Directors
H.M. Twombly - Chairman
F.L. Ames Eugene Griffin
C.A. Coffin F.S. Hastings
T.J. Coolidge, Jr. H.L. Higginson
C.H. Cooper D.O. Milb
T.A. Edison J.P. Morgan

Works Managers
Manager - Schenectady Works - John Kreusi
Manager - Harrison Works - Francis R. Upton
Manager - Lynn Works - George E. Emmons

Technical Director - Edwin W. Rice, Jr.

Department - General Managers
Lighting - S. Dana Greene
Railway - O.T. Crosby
Power - John R. McKee
Supply - Jesse R. Lovejoy

GENERAL ELECTRIC COMPANY,
SCHENECTADY N.Y

On July 5, 1892, the following resolution was

passed by the Board of Directors of the General Electric

Company:

"That the resignation of Mr. Insull of the
office of Second Vice President of this Company
be and hereby is accepted, to take effect August
1, 1892, and the Secretary is hereby directed
to convey to Mr. Insull the thanks and appreciation
of this Board for the efficient service rendered
by him."

Mr. Insull of course has in his possession the letter
of the Secretary written in compliance with the request
contained in the above resolution.

very truly yours,

[Signature]

Figure 1.10 The new General Electric Company appointed the 32-year-old Samuel
Insull as second vice president, the number three position at the company. Insull resigned
from the great manufacturing concern to start anew in the distribution side of the business,
leaving New York City for Chicago.
The Chief: Samuel Insull

president of Chicago Edison on May 26, 1892, with a start date of July 1. His salary—determined by Insull himself—was $12,000, one-third of what he was making at General Electric.

A farewell dinner for Insull was held at Delmonico's, his favorite restaurant and New York City's finest—and the one that had let Edison and him run a tab in lean times. The merger completed, executives of General Electric hosted the event in honor of the departing dynamo. It was a sign of not only respect and goodwill but also client relations, given that Chicago Edison was a General Electric customer.

![Image of Menu]

_Figure 1.11_ Insull, who resigned from General Electric in July 1892, was given a farewell dinner in New York City at his favorite restaurant, Delmonico's. The elaborate affair, hosted by Charles Coffin and General Electric, was attended by a who's who of the young industry.

The room was filled with "intimate friends and intimate enemies," the former led by Thomas Edison and the latter including Henry Villard and Charles Coffin. Edward Johnson, Charles Batchelor, and John Kruesi from the old Edison ranks were present. J. P. Morgan, always the invisible force, was absent.

Speeches followed the repast, topped off with a resolution to the honoree and the presentation of a beautiful silver punch bowl. Insull then rose. He gave terse
thanks and shared his goal and expectation: to make his new company bigger than the one he was leaving. *Chicago Edison bigger than General Electric? Insull besting Coffin? Chicago over New York City?* The prediction was audacious and even laughable—except for the fact that Samuel Insull, always serious, said it. Five days later, Insull was off to Chicago to make good for the fourth time in his life.