

## Outlook

### How the electrical age transformed America

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Wireless Internet, hybrid cars, smartphones, high-speed rail, video streaming. We imagine ourselves at the apex of a technological revolution. But nothing at present can compare to the societal upheavals experienced by those at the end of the 19th century.

Today we largely undergo variations on a theme - faster, easier, cheaper. Those in the Gilded Age, however, witnessed mind-bending changes in communication, infrastructure, transportation and entertainment hardly imagined beforehand. Buildings soared into the sky, people talked over wires, and steam-engine trains linked a nation. "Men and women of the nineteenth century were the first to live in a world shaped by perpetual invention," writes Ernest Freeberg, a professor of humanities at the [University of Tennessee](#), in "The Age of Edison." And if there is one person who stands out as a chief architect in that transformative era, it is Thomas Edison.

Edison is renowned for his wide range of inventions, from the stock ticker and phonograph to the motion picture camera. But to Freeberg, Edison's greatest legacy was his contribution to incandescent lighting. He sees this as a linchpin of America's rise in entrepreneurship.

We now take the availability of electric light, both public and private, for granted. Flip a switch, and our way is instantly illuminated. But back then, Freeberg writes, people were just realizing that "the light was creating them - changing their relationship to the natural world, shaping the rhythm of their days, and transforming their culture."

"The Age of Edison" is not a detailed history of Edison's role in the development of electric lighting but rather a grand overview of the invention's sweeping repercussions on America's soul. Digging deeply into archives and old newspapers, Freeberg takes us on a captivating intellectual adventure that offers long-forgotten stories of the birth pangs of the electrical age that are amusing, surprising and tragic.

It did not start with the incandescent bulb but rather with the carbon-arc, a harsh and intense light emitted as current leaps the gap between two carbon rods. This type of lighting was first used in large public spaces - train stations, department stores, factories. For a while in the 1880s, cities around America competed with one another to install the powerful arcs atop tall towers, bathing an entire town in a ghostly light at nighttime. But arc lights flickered and hummed, and were totally inappropriate for homes. For that setting, warmer and cozier incandescent light was the holy grail, the perfect replacement for smelly gaslights: no fumes, no flicker, no matches, no maintenance.

Despite the legend, Edison did not "invent" the light bulb. Others, such as Joseph Swan in England, had been working on the concept for years. What Edison brought to the table was the vision of a complete system: not just a reliable bulb but a central power station that could distribute electricity, powering the lights, to houses over many city blocks. He was the one who thought of the challenges of "safely burying his wires and delivering current at a reasonable cost across a wide area, with switches that allowed customers to turn their lamps on and off without disrupting the entire system," Freeberg notes. Edison and his lab crew in Menlo Park, N.J., knew it would be a huge enterprise, and he was its greatest salesman.

By 1885 more than 600 companies were vying for business across the United States. City skies were thick with overhead high-tension wires. Electrical accidents were rampant. In New York a telegraph lineman died instantly upon touching a live wire, but his body remained trapped in the wiry labyrinth. "As comrades struggled to free his corpse," Freeberg writes, "thousands of New Yorkers gazed up, watching flames shoot from the lineman's mouth and nostrils and roast his hands and feet." Genuine fear led to government regulation and safety laws, as well as fierce debates over public vs. private ownership that still resonate.

But the genie was out of the bottle. Here was the start of 24/7. With better illumination, both at night and indoors, came a quicker pace of life. Factories could produce round the clock, and nightlife flourished. Migration from rural outposts to urban cities accelerated, not just because of jobs but also because of the expanding range of evening entertainments - "fancy balls that began at midnight, ball games and amusement parks, luxurious hotels and boulevards blazing with light all night long . . . long after farmers and country villagers had gone to bed."

It was at this moment that America was first recognized as a leader in technological innovation, aided by public education for all citizens, generous patent laws that rewarded engineering improvements and employment shortages that encouraged the search for labor-saving devices.

Although the gap between rich and poor widened at the turn of the 20th century, electric light gradually became available to all. By 1930, 70 percent of America was wired. For the first time in history, a well-lighted house was not the sole privilege of the wealthy. Family ties loosened as parents and siblings ventured beyond the hearth at night for individual pursuits.

Edison never imagined the many fields that would experience vast advances with better lighting: photography, deep-sea exploration, microscopic investigations, medical surgery. Taming the glaring light inspired artists to fashion sculpted lamps, shades and lampposts. And universities began offering degrees in electrical engineering, a vital step that fueled the high-tech revolutions we enjoy now.

And it all started so simply, as Freeberg so engagingly puts it, with "a glass globe shaped like a dropping tear, enclosing a slender horseshoe of glowing carbon." More than a century later that bulb, even though now fluorescent or LED, remains the classic icon for new and creative ideas.

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