

The Snock of the new

The first standards war of the modern era,
between Thomas Edison and George Westinghouse,
had some macabre consequences

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This is the story of two proud entrepreneurs, both founders of iconic tech companies, fighting a winner-takes-all war over industry standards to ensure that their technology has the dominant share of a massive emerging market. Patent fights, lobbying, public affairs campaigns and a healthy dose of showmanship result. And one standard emerges as the clear winner.

Gates vs. Jobs? Windows vs. Macintosh? Betamax vs. VHS? Good guesses, but this was the first standards war of the modern era, played out in America's "Gilded Age" at the end of the 19th century. It was a battle for the standards used in the hot new technology of the time: electricity. Think alternating current vs. direct current (AC vs. DC). Edison vs. Westinghouse. New Jersey vs. Pennsylvania. Two captains of industry fighting to ensure that their mode of electricity delivery would become the standard for businesses and homes. It was the first technical standards war, a high-stakes battle in the court of public opinion to determine which man would become modernity's "emperor of light."

Thomas Edison, the champion of direct current, began with a commanding lead. His previous inventions, including the phonograph and the long-lasting incandescent lightbulb, had made him famous and he had his sights set on a world electrified by a network of local Edison power plants. In 1882, the Edison Electric Light Company – with backing from W.H. Vanderbilt, the heir to a railway fortune, banker J.P. Morgan, and Western Union – electrified lower Manhattan with the Pearl Street Station. This was the first central power plant in the US, and it began disrupting the gas light market, an industry Edison attacked as unsafe and derided as "the old time light." By 1884

Edison power stations were also pushing DC power to Boston, Chicago, Philadelphia, New Orleans, and many other American cities.

Beyond his first-mover advantage and strong financial backing, Edison had the public's adulation. With fame rivaling that of today's tech billionaires, Edison had a special gift for publicity. Reinforcing his image as an inventor, he eschewed the formal dress of his day and wore laboratory work clothes. He summoned reporters to his Menlo Park, New Jersey headquarters to wonder at his inventions. He charmed New York City's political machine, its aldermen and the Superintendent of Gas, the regulatory authority for gas lighting in the city. And he astutely ensured that *The New York Times* was powered by the Pearl Street Station plant on its first day of operation, earning him glowing coverage in the country's paper of record.

Thus, Edison and direct current held the dominant position. But DC had a serious flaw: local power plants could only push direct current within a one-mile radius, requiring the construction of numerous local power stations.

Enter George Westinghouse, an inventor and progressive industrialist from Pittsburgh, Pennsylvania with a fortune from railroad safety products, which he began inventing at the age of 22. Westinghouse began competing against Edison with Siemens dynamos pushing DC power to neighborhoods, but Edison's position in the market was virtually unassailable. This drove Westinghouse to search for a technology that would disrupt direct current. He found his disruptive technology in 1885 while reading the English trade journal, *Engineering*, with its description of the novel Gaulard-Gibbs system of generating alternating current. ➡

Westinghouse, understanding immediately that alternating current could be generated and sent for miles before being “stepped down” to homes and businesses, put everything behind this novel method. And in a masterstroke, he brought in Nikola Tesla, a Serbian-born engineer, former Edison employee, and owner of a patent for a new AC motor. By 1886, the Westinghouse Electric Company had quietly begun using alternating current to power retailers in the small town of Great Barrington, Massachusetts, and in Buffalo, New York. In contrast to Edison, however, the reserved Westinghouse avoided the press, fearing the loss of his trade secrets.

Edison reacted to Westinghouse’s moves with alarm. In his view, not only was AC a threat to his DC business, it was a threat to public health. Having disrupted the gas light market with his incandescent bulb and the DC power business, Edison quickly realized that his favored DC power itself could be disrupted. Yet, like many engineers of his day, Edison was also genuinely concerned about the safety of high voltage AC systems strung overhead. He did not believe that high voltage AC power could be stepped down safely before entering homes and businesses. He truly believed that DC power was safer and, in order to maximize safety, had employed an army of Irish laborers to bury his power lines, at great expense, in lower Manhattan. Edison’s initial reaction to Westinghouse’s technology was blunt: “Just as certain as death, Westinghouse will kill a customer within six months.”

In a clash reminiscent of his fight against gas lighting, “the war of the currents” began, with Edison positioning DC as safer than AC. Edison pamphlets described AC as “deadly” and claimed that the use of AC “greatly enhanced risks to life and property.” The Edison campaign even sparked popular concern over accidental electrocution, as the newspapers began to methodically tally instances of “electrocution by wire.”

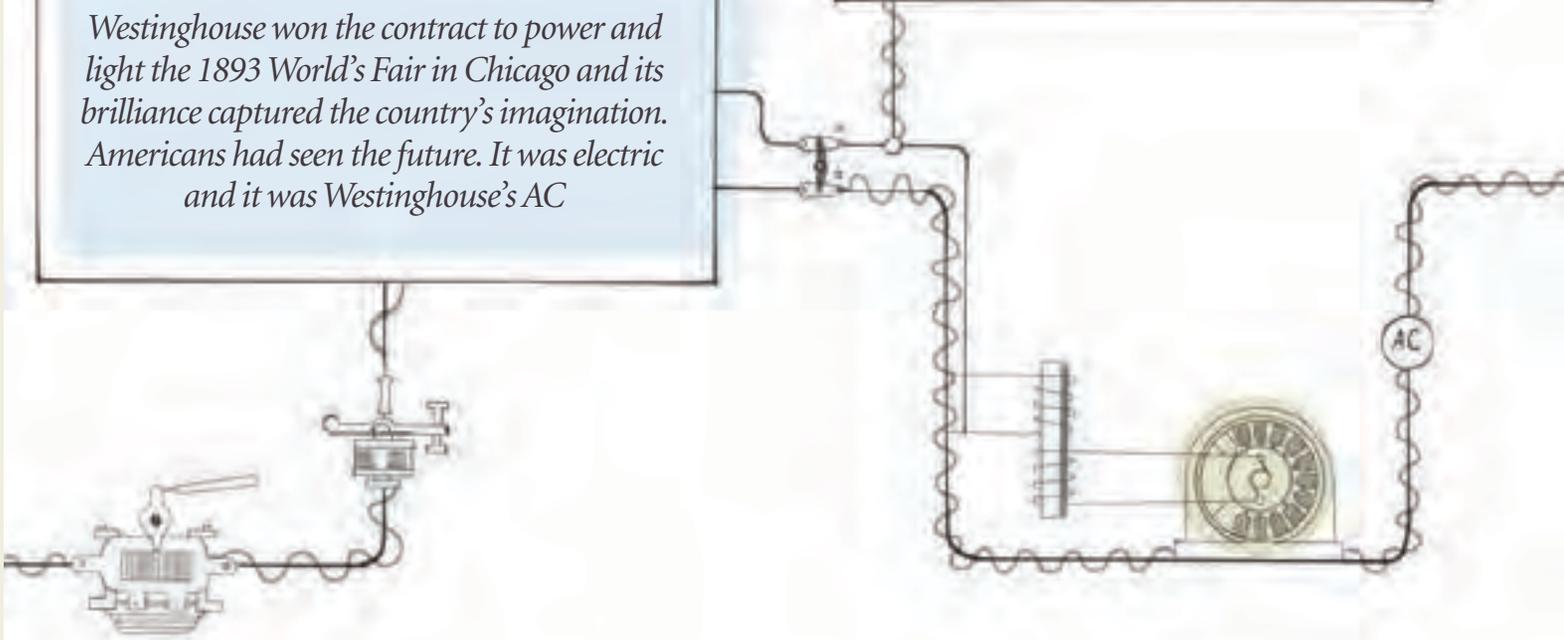
Unfortunately, the public affairs campaign against AC veered into the macabre. First, a self-proclaimed safety crusader named Harold Brown held well-attended public demonstrations in which animals, mostly stray dogs, were electrocuted by AC power in order to prove its deadly nature. These shocking attacks on AC culminated in the bizarre electrocution of a rogue Coney Island circus elephant named Topsy in 1903. The electrocution was

Westinghouse won the contract to power and light the 1893 World’s Fair in Chicago and its brilliance captured the country’s imagination. Americans had seen the future. It was electric and it was Westinghouse’s AC

LESSONS LEARNED

Standards wars share a number of similarities; “the war of the currents” casts light on many of these.

1. First-mover advantage is no guarantee of success. It wasn’t for direct current or Betamax. Still, if Edison had time to scale his system, he may have locked down key urban areas and crowded out AC.
2. Old and new technologies can coexist for some time. Gas and kerosene were relatively cheap and electricity did not immediately replace them. In 1907, only 8 percent of US homes enjoyed electricity; by 1920 it was 35 percent.
3. Standards wars are often about much more than technology. In the war of the currents, the merits of the competing technologies were often lost in the drama surrounding the personas of Edison, Westinghouse, and Tesla. Corporate and executive reputation matter.
4. Police your third-party advocates. Edison tried to keep his distance from Brown but was implicated when their connection was exposed.
5. Play for the inflection points. Edison worked toward knockout blows on safety. Westinghouse bid for the Chicago World’s Fair project with almost zero profit in order to showcase his technology to a skeptical public. Had he not won the contract, the war of the currents may have raged for a generation.
6. Like a political campaign, standards wars are often decided by success in framing the issue. Edison tried to make it about consumer safety, Westinghouse about power delivery over distance.
7. Language matters. Edison knew this best, positioning gas light as the “old time light” and unsuccessfully attempting to pin the term for electrocution on his rival.





recorded by a new Edison invention, film, and exists to this day. In a warning to any company enlisting third parties in a public affairs war, Harold Brown was eventually exposed by the newspapers of the day for his hidden ties to the Edison camp. In August 1889, *The Sun*, a New York newspaper, exposed Brown with the headline: “For Shame Brown! Paid By One Electric Company to Injure Another.”

The electrocution story took another, more hideous turn: the electric chair. Edison, initially an opponent of capital punishment, had written to the New York State Commission in 1887 suggesting that the surest means of execution would come from his rival’s technology, alternating current. Three years later, convicted murderer William Kemmler was electrocuted in a purpose-built chair using AC. After Kemmler’s execution, Edison suggested a new name for this hi-tech capital punishment – “Westinghoused.” The term did not catch on. The electric chair did.

Ultimately, Westinghouse and AC won the war of the currents on technical merit *and* in the court of public opinion. It succeeded with two well-publicized achievements that captured the American public’s imagination. First, in what the press covered as a David and Goliath story, Westinghouse dramatically underbid the newly-formed General Electric Company to win the contract to power and light the 1893 World’s Fair in Chicago. The fight to power the World’s Fair was a turning point in his media relations strategy. The understated Westinghouse shed his media-shy tendencies and instructed his public relations adviser, Ernest H. Heinrichs, to plead the company’s case with all Chicago newspaper editors and capitalize on growing American uneasiness with industrial concentration. The strategy worked. Westinghouse, with a sterling reputation as an industrialist who was determined to pay a living wage, connected with the *zeitgeist* and positioned himself as the underdog. This was smart politics, as the Sherman Antitrust Act had passed into law only three years earlier, and a rapidly urbanizing and industrializing America struggled with the emergence of large, vertically integrated enterprises.

The *Chicago Times* roared, “Will Underbid the Trust: Mr Westinghouse Promises to Make Electrical Fur Fly.” The PR offensive and the World’s Fair coup were enormous successes for AC and Westinghouse. The fair was

flooded with dazzling light, earning the nickname “The White City.” Its brilliance captured the imagination of Americans – it even inspired Frank Baum’s Emerald City in *The Wizard of Oz*. Americans had seen the future. It was electric and it was Westinghouse’s AC.

The second game-changer came in 1895, when Westinghouse was able to overcome significant skepticism from the International Niagara Commission to construct an AC power system sending electricity from Niagara Falls to central and western New York. The war of the currents was all but over.

AC beat DC and won the war of the currents. General Electric quickly pivoted and competed successfully in the AC power market. In Promethean fashion, Westinghouse gave America alternating current but he lost his manufacturing company in the financial panic of 1907 and his beloved electrical company in a proxy battle in 1911. Tesla, the eccentric genius, descended into increasingly bizarre behavior, claiming invention of a “death ray.” Edison turned his genius to other inventions and searched for emerging industries in which his beloved DC power could thrive. A full century ahead of his time, Edison focused his efforts on battery power and the battery-powered automobile and even created a functional one, too.

The first technology standards war is also the most instructive. First-mover advantage is no guarantee of success; in the media, the personalities of the founders and inventors will be inseparable from the technology itself; monitor your third-party advocates; and play for breakthrough inflection points. Don’t be deceived, a standards war is as much a political campaign as a battle between technologies.

Finally, language matters. Edison, the first American captain of industry to master media relations, nearly succeeded in sidelining AC with a rhetorical focus on consumer safety. Own the language and you control the terms of the debate. 🍷

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SHOCK TACTICS

Perhaps the most bizarre episode in “the war of the currents” was the electrocution of Topsy, a carnival elephant, in 1903. Direct current had already lost the war by then, but Thomas Edison saw one last chance to embarrass his rival George Westinghouse’s alternating current, and he took it.

Brought to America in 1885, Topsy the elephant, crushed two trainers under her massive feet and killed a third in Brooklyn with her trunk. Coney Island officials prepared to hang the elephant and, improbably, began erecting a wooden scaffold. The Society for the Prevention of Cruelty to Animals intervened on humane grounds and Edison’s timely suggestion of electrocution by AC was accepted.

It took 10 seconds to electrocute Topsy. The event is preserved in one of the first short films, made by Edison, *Electrocuting an Elephant*. Described the following day on the front page of *The New York Times* as “a rather inglorious affair,” it was a gruesome coda to the first modern standards war.

