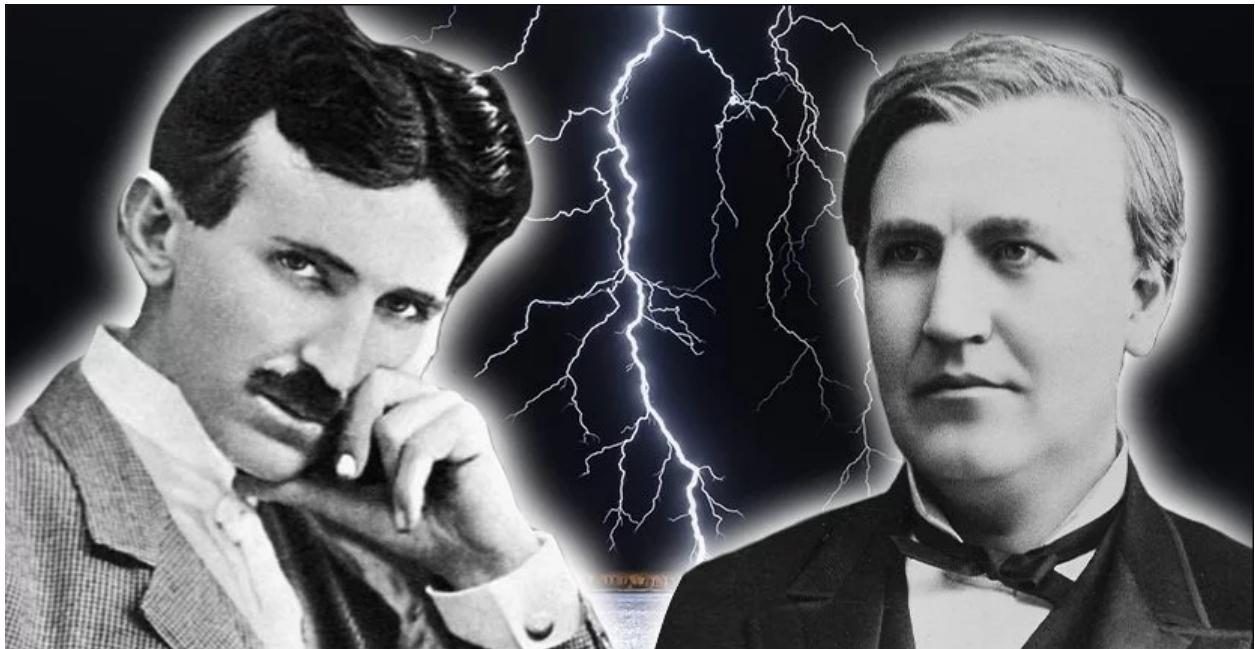


WAR OF THE CURRENTS: TESLA & EDISON'S FEUD

Breaking Barriers in Electric History



Olivia Walton

The War of the Currents: Tesla & Edison's Feud

Junior Category - Individual Website

Student Composed Words: 1,148

Process Paper Words: 500

Multimedia: 3:46

Primary Sources

“Advertisement for the Edison New Standard Phonograph.” Harper’s. September 1898.

This was an ad for Edison’s New Standard Phonograph Company. I used the image to show one of Edison’s many companies.

“Agreement, Oriental Bell Telephone Co, Oriental Telephone Co Ltd, Alexander Graham Bell, Thomas Alva Edison, February 17th, 1881,” Edison Papers Digital Edition, accessed February 22, 2020, <http://edison.rutgers.edu/digital/document/D8150C>.

This was a written agreement between Thomas Edison and Alexander Graham Bell to create the Oriental Telephone Company, one of Edison’s many companies. I used an image of the agreement along with several other photos to show how much of an entrepreneur Thomas Edison was.

“Bad for the Big Black Dog.” The sun. [volume] (New York [N.Y.]), 31 July 1888. *Chronicling America: Historic American Newspapers*. Lib. of Congress. <<https://chroniclingamerica.loc.gov/lccn/sn83030272/1888-07-31/ed-1/seq-3/>>

During my research about Harold Brown’s effort against alternating current, I found a detailed article about Brown’s demonstration of the effects of AC and DC currents on a stray dog. It was a great, descriptive first-hand account of how brutal his campaign was to prove that AC electric was deadly.

“Clipping, New York Journal, Harold P Brown, July 14th, 1889,” Edison Papers Digital Edition, accessed February 21, 2020, <http://edison.rutgers.edu/digital/document/SM007088a>.

This was one of Harold P. Brown’s letters to newspapers as part of his campaign against Westinghouse and AC.

“Clipping, New York Journal, May 22nd, 1896,” Edison Papers Digital Edition, accessed February 22, 2020, <http://edison.rutgers.edu/digital/document/SC96038A>.

This article talked about the rivalry between Thomas Edison and Nikola Tesla. I used it to learn more about the animosity between the two men and how it resulted into the War of the Currents.

“Edison Illuminating Light Station, Detroit, Michigan, circa 1891.” The Henry Ford, www.thehenryford.org/collections-and-research/digital-collections/artifact/372968/#slide=gs-339815.

This was a picture of one of Edison’s lighting stations using DC electric. I used the image to show one of Edison’s many companies.

“Edison’s Horseshoe Light.” The Anderson intelligencer. [volume] (Anderson Court House, S.C.), 08 Jan. 1880. *Chronicling America: Historic American Newspapers*. Lib. of Congress. <<https://chroniclingamerica.loc.gov/lccn/sn84026965/1880-01-08/ed-1/seq-4/>>

This article was one of earliest ones I found in *Chronicling America* about Edison progressing to multiple outdoor electric lights. I used this to show how quickly Edison’s efforts to create a electric-based lighting system was happening in the 1800s.

“Henry is a hustler” St. Paul daily globe. [volume] (Saint Paul, Minn.), 26 Dec. 1888. *Chronicling America: Historic American Newspapers*. Lib. of Congress. <<https://chroniclingamerica.loc.gov/lccn/sn90059522/1888-12-26/ed-1/seq-5/>>

During my research about Edison and Westinghouse, I found this article where Edison’s colleague Frank Hastings gave a harsh review of Westinghouse and his AC system. I included this as evidence of the Edison Company’s campaign against AC efforts.

“Letter from Frank Seymour Hastings, Edison Electric Light Co to Thomas Alva Edison, January 21st, 1889,” *Edison Papers Digital Edition*, accessed February 22, 2020, <http://edison.rutgers.edu/digital/document/D8933AAF>.

This was one of the letters I used to show how Harold P. Brown was working with Edison’s company on his campaign against Westinghouse.

“Letter from Frank Seymour Hastings, Edison Electric Light Co to Thomas Alva Edison, January 21st, 1889,” *Edison Papers Digital Edition*, accessed February 22, 2020, <http://edison.rutgers.edu/digital/document/D8933AAF>.

This was one of the letters I used to show how Harold P. Brown was working with Edison’s company on his campaign against Westinghouse.

“Letter from Harold P Brown to Arthur Edwin Kennelly, August 4th, 1888,” *Edison Papers Digital Edition*, accessed February 22, 2020, <http://edison.rutgers.edu/digital/document/D8828ACS>.

This was one of the letters I used to show how Harold P. Brown was working with Edison’s company on his campaign against Westinghouse.

“Letter from Harold P Brown to Thomas Alva Edison, October 22nd, 1889,” *Edison Papers Digital Edition*, accessed February 22, 2020, <http://edison.rutgers.edu/digital/document/D8933ABR>.

This was one of the letters I used to show how Harold P. Brown was working with Edison’s company on his campaign against Westinghouse.

“Letter from Thomas Alva Edison to Edward Hibberd Johnson, November 1886,” *Edison Papers Digital Edition*, accessed February 22, 2020, <http://edison.rutgers.edu/digital/document/X710A>.

Edison wrote this letter to his colleague, concerned about Westinghouse’s AC system and how his rival was aggressively selling the system through travelling salesmen.

“Letter from Thomas Alva Edison to Alfred Porter Southwick, December 19th, 1887,” Edison Papers Digital Edition, accessed February 22, 2020, <http://edison.rutgers.edu/digital/document/LB026116>.

This was Edison’s response to Southwick, who wanted his help with the electric chair, where he stated that Westinghouse’s system would be more useful in killing people.

“Local News.” Connecticut western news. [volume] (Salisbury, Litchfield Co., Conn.), 22 June 1887. *Chronicling America: Historic American Newspapers*. Lib. of Congress. <<https://chroniclingamerica.loc.gov/lccn/sn84027718/1887-06-22/ed-1/seq-3/>>

This was one of the earliest articles I found about a successful effort by Westinghouse’s team to install electric lighting in the Hoosac Tunnel using alternating current. I wanted to show his progress with AC in comparison to Edison’s effort with DC.

New-York tribune. [volume] (New York [N.Y.]), 13 Jan. 1897. *Chronicling America: Historic American Newspapers*. Lib. of Congress. <<https://chroniclingamerica.loc.gov/lccn/sn83030214/1897-01-13/ed-1/seq-2/>>

This source discussed the launch of the Niagara Falls Power Plant. I found this through the *Chronicling America* archives and used this as part of the Niagara Fall AC-Based Power Plant timeline under Short-Term Impact.

“NIAGARA POWER IN NEW-YORK.” *New York Herald Tribune*, 16 Apr. 1896.

This source explains Tesla’s link to the efforts to build AC-power sources from Niagara Falls. I used this as part of the Niagara Fall AC-Based Power Plant timeline under Short-Term Impact.

“Roentgen Rays at Work.” *The Seattle post-intelligencer*. [volume] (Seattle, Wash. Terr. [Wash.]), 04 May 1897. *Chronicling America: Historic American Newspapers*. Lib. of Congress. <<https://chroniclingamerica.loc.gov/lccn/sn83045604/1897-05-04/ed-1/seq-4/>>
This source talked about the potential impact of Tesla’s X-ray invention. I found this article during my search for articles about Nikola Tesla on the *Chronicling America* archives.

“Tesla’s Latest Feat,” *The Salt Lake Herald* (Salt Lake City, UT), November 9, 1898, Page 7, Image 7, col. 1-2

This source covered Tesla’s invention for a remote-controlled boat. That invention eventually became the basis of many other technologies.

“The Power Station at Niagara.” *Scientific American Supplement*, 3 Feb. 1894, pp. 15082–15083.

This source had an illustration of the Niagara Falls Power Stations. I used this as part of the Niagara Fall AC-Based Power Plant timeline under Short-Term Impact.

“The Electric Light.” *Evening star*. [volume] (Washington, D.C.), 23 April 1879. *Chronicling America: Historic American Newspapers*. Lib. of Congress. <<https://chroniclingamerica.loc.gov/lccn/sn83045462/1879-04-23/ed-1/seq-1/>>

This was the earliest article I found within the Chronicling America archives that described Edison's patent for arc lighting.

"The Electric Light for 1887." Omaha daily bee. (Omaha [Neb.]), 22 Jan. 1888. Chronicling America: Historic American Newspapers. Lib. of Congress.
<<https://chroniclingamerica.loc.gov/lccn/sn99021999/1888-01-22/ed-1/seq-12/>>

This article was important because it mentioned Westinghouse specifically as a "prominent" distributor for electric lighting. This could be one of the reasons why Edison was concerned about Westinghouse's growing success.

"The Electric Light in Houses -- Laying the Electrical Tubes," Harper's Weekly, June 21, 1882.

This article included a photo of men working for Edison's company installing DC power lines. I used the photo to show how his electrical system was becoming mainstream.

"Undersea HVDC Cables, Discovering Some of the World's Top Power Interconnections." Image, 2017, www.youris.com/energy/gallery/undersea-hvdc-cables-discovering-some-of-the-worlds-top-power-interconnections.kl.

Despite Edison's perceived loss in the War of the Currents, there are still several uses of DC power today. I learned about how DC power is still being used under the sea to transmit power between two islands, such as Norway and the Netherlands. I also used the image from this article to show DC power's long-term impact.

Corners, George F. "Nikola Tesla's Youth and Strength at 78." Physical Culture, Mar. 1935.

This interview with Nikola Tesla discussed his habits and values that centered around his focus on working. I used a couple of quotes, one about his sleeping and another about his philosophy on marriage.

Duncan, Louis. "Advertisement: Alternating Current System." Electrical Engineer, June 1888.

I used this image of a Westinghouse advertisement for AC systems to show how Westinghouse was trying to compete with Edison's DC system.

Sudetic, Adam. "Dr. Nikola Tesla Held in Contempt Guglielmo Marconi's Wireless System." Zajedničar = Fraternalist. [volume] (Allegheny, Pa.), 23 May 1956. Chronicling America: Historic American Newspapers. Lib. of Congress.
<<https://chroniclingamerica.loc.gov/lccn/sn84024547/1956-05-23/ed-1/seq-8/>>

During my research, I learned that Nikola Tesla actually developed the concepts of the two-way wireless radio before Guglielmo Marconi claimed to invent his telegraph. I searched for articles on Chronicling America to find evidence to support this claim and found this article. I used it to show how Tesla's inventions had long-lasting effects on our current technology.

Secondary Sources

"A Warning from the Edison Electric Light Company," 1887." The Henry Ford, www.thehenryford.org/collections-and-research/digital-collections/artifact/409856/.

This was part of Edison's campaign to discourage businesses from going to Westinghouse's AC business.

"Edison Biography." National Parks Service, U.S. Department of the Interior, www.nps.gov/edis/learn/historyculture/edison-biography.htm.

This site helped me understand who Thomas Edison was. It led me to search for primary sources that I could use for this project.

"Home." Mit Engineering, <http://engineering.mit.edu/engage/ask-an-engineer/whats-the-difference-between-ac-and-dc/>.

This article helped my understanding of what AC and DC systems are.

"Edison and Swan Electric Light Company." Wikiwand, 1893, www.wikiwand.com/en/Edison_and_Swan_Electric_Light_Company.

This article in Wikiwand gave me an overview of one of Edison's many companies. I used the photo included in the article and their description of Edison & Swan United Electric Light Company in my project.

"Niagara Falls History of Power Development Quick Facts about Niagara Power." Niagara Falls Info, 3 Feb. 2017, www.niagarafallsinfo.com/niagara-falls-history/niagara-falls-power-development/the-history-of-power-development-in-niagara/niagara-power-generating-quick-facts/.

I understood the significance of Niagara Falls as a power source better through this website. It helped me understand what Tesla's long-term impact was on modern electric technology.

"Nikola Tesla. Inventions That Transformed the World." Nikola Tesla. Inventions That Transformed the World., www.occultphysics.com/Nikola-Tesla-Inventions.html.

This article helped me learn about Tesla's different inventions and their long-term impact on modern technology. I included some of his latter inventions that became well-known and important after his "victory" in the War of the Currents.

"Nikola Tesla vs. Thomas Edison: Who Was the Better Inventor?" LiveScience, Purch, www.livescience.com/46739-tesla-vs-edison-comparison.html.

This source was one of the first articles I have read that discussed Tesla and Edison's rivalry. It gave a comparison of each inventor's strength and weakness during their feud.

“Nikola Tesla Universe.” Nikola Tesla Universe, 17 Dec. 2019, teslauniverse.com.

Most of my research in understanding Nikola Tesla came from the archives of Tesla Universe. I learned about how Tesla had accidentally discovered x-rays even though Wilhelm Rontgen was credited for its invention.

“Photo Gallery.” National Parks Service, U.S. Department of the Interior, 1895, www.nps.gov/edis/learn/photosmultimedia/photogallery.htm.

Even though I learned about the Edison Ore-Milling Company through another source, I wanted to include them in the list of Edison’s companies to show the reach of his power in many industries. The NPS website of his museum had a picture of one of his mills.

“Tesla versus Edison: Lessons from the AC/DC War.” Physics World, 8 Aug. 2018, <https://physicsworld.com/a/tesla-versus-edison-lessons-from-the-ac-dc-war/>.

This article gave me some of the important information I included in the War of the Currents section of my website. It also led me to different primary sources that I have used in that section.

“The Forgotten Hero of the American Subway.” PBS, Public Broadcasting Service, March 2017, www.pbs.org/wgbh/americanexperience/features/race-underground-forgotten-hero-american-subway/.

I learned about who Frank Sprague was through this source and used his image and their description of Sprague from the source.

“The War of the Currents: AC vs. DC Power.” Energy.gov, www.energy.gov/articles/war-currents-ac-vs-dc-power.

This source helped me understand the differences between the two electric current systems.

“War of Currents: AC vs DC.” Open Tesla Research, <https://teslaresearch.jimdofree.com/war-of-currents/>.

This source provided an extensive background in the War of Currents. I used it to develop an outline of key events in the war that I needed to research and find evidence through primary sources.

AmericanExperiencePBS. “The Columbian Exposition, from Tesla.” YouTube, 14 Oct. 2016, <https://youtu.be/ONMHUGVZmeg>.

Other sources I have read talked about how significant Westinghouse’s light displays at the Columbian Exposition using AC were to the War of the Currents. This video showcased the different images from that Exposition and summarized the impact of Westinghouse’s strategy on his feud with Edison.

Bilyeau, Nancy. "Electricity Battle Between Edison and Tesla Comes to Life in New Film." The Vintage News, 8 Oct. 2019, www.thevintagenews.com/2019/07/16/edison-tesla-film/.

I wanted to use a cover photo that showed both Tesla and Edison and this website had the perfect graphic that showed both men with lightning bolts in the background.

Center, Smithsonian Lemelson. "Innovative Lives: Lewis Latimer (1848-1928): Renaissance Man." Lemelson Center for the Study of Invention and Innovation, 7 Feb. 2018, <https://invention.si.edu/innovative-lives-lewis-latimer-1848-1928-renaissance-man>.

I learned about who Lewis Howard Latimer was through this source and used his image and their description of Latimer from the source.

ClimateWire. "Edison's Revenge: Will Direct Current Make a Comeback in the U.S.?" Scientific American, Scientific American, 22 Mar. 2012, www.scientificamerican.com/article/edisons-revenge-will-direct-current-make-a-comeback-in-us/.

During my research about the War of the Currents, I ran into this article that discussed whether DC currents were going to make a comeback. Included in the source were different examples of current use for DC power, including an image of data centers that ran on DC energy and wind turbines.

Collins, Theresa M., Lisa Gitelman, and Gregory Jankunis. *Thomas Edison and Modern America*. Boston: Palgrave Macmillan, 2002.

This book had a great excerpt about Thomas Edison's impact on technology, especially on the innovation that moved it forward. I included the excerpt to show that not only was he a determined businessman, Edison also supported the continuing evolution of technology.

Conot, Robert E., and Matthew Josephson. "Thomas Edison." Encyclopædia Britannica, Encyclopædia Britannica, Inc., 7 Feb. 2020, www.britannica.com/biography/Thomas-Edison.

This article gave me additional information about Thomas Edison when I started to work on my research about him. I used their image of Edison on the homepage.

Discovery UK. "Thomas Edison Did Everything He Could To Stop Nikola Tesla Succeeding." YouTube, 27 Dec. 2018, <https://youtu.be/pcrwTN5OEZY>.

This documentary discussed how Edison and Tesla's paths crossed and what started their lifelong feud. I used three clips from this documentary to show why Tesla's inventions related to AC currents were barrier-breaking advancements to electric distribution and why Tesla left Edison's company.

ExplorePAHistory.com Image, 1912. explorepahistory.com/displayimage.php?imgId=1-2-15B6.

I learned about who Edward Goodrich Acheson was through this source and used his image from the link.

Frances M. Perry, "The Story of Thomas A. Edison: Youthful Business Ventures." In *Four American Inventors: A Book for Young Americans*, New York, Cincinnati, and Chicago: American Book Company, 1901, Pages 209-215

While I was researching Edison's businesses, I learned that he sold newspapers while working on a train. I looked into the newspaper and found this excerpt from Frances Perry's book. I thought it captured Edison's ruthless business approach, especially at a young age. I included the excerpt in the Edison section of my project.

Gelderman, Carol W. "Henry Ford." *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., 26 July 2019, www.britannica.com/biography/Henry-Ford.

I learned about who Henry Ford was through this source and used his image and their description of Ford from the source.

Hill, Andrew. "General Electric Goes Back to Basics." *Financial Times*, Financial Times, 29 June 2018, www.ft.com/content/99709110-7adb-11e8-8e67-1e1a0846c475.

When I was searching for information about General Electric, I found this article and it included an advertisement by General Electric with Carmen Miranda. I thought it was the perfect representation for GE, because most Edison companies I mentioned in my project were in black and white. Having an image that was more recent showed that Edison's influence spanned many generations.

Hunt, Inez Whitaker. "Nikola Tesla." *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., 3 Jan. 2020, www.britannica.com/biography/Nikola-Tesla.

This was one of the first articles I read about Tesla and used the material as the starting point of my research for his biography. I used their image and description of Tesla in the photos of people who had worked for Edison.

Ivanković, Radmilo, and Dragan Petrović. "Nikola Tesla: Notebook from the Edison Machine Works 1884-1885." *Tesla Universe*, Tesla Universe, May 2003, <https://teslauniverse.com/nikola-tesla/books/nikola-tesla-notebook-edison-machine-works-1884-1885>.

This source captured Tesla's tenure in Edison Machine Works, especially what he worked on and how he was an employee.

O'Neill, James. *Prodigal genius: the life of Nikola Tesla*. Book Tree, 2007.

This book included a great quote about how all of the modern symbols and presence of electricity should be a monument to Tesla since his innovations were the driving force behind the advancements in electric distribution. I included this quote under the long-term impact section.

Tesla Memorial Society of New York, www.teslasociety.com/exhibition.htm.

This source was also among the first resources I used to learn more about Nikola Tesla. I also used images of his AC generators from this site to talk about long-term impact of his AC-based power system on modern power generation.

The Editors of Encyclopaedia Britannica. "Reginald Aubrey Fessenden." Encyclopædia Britannica, Encyclopædia Britannica, Inc., 2 Oct. 2019, www.britannica.com/biography/Reginald-Aubrey-Fessenden.

I learned about who Reginald Fessenden was through this source and used his image and their description of Fessenden from the source.

Tollefson, Al. "Looking Aft: Inventors Who Lived in Our Community." SWNewsMedia.com, 6 Mar. 2017, www.swnewsmedia.com/lakeshore_weekly/news/local/looking-aft-inventors-who-lived-in-our-community/article_09fa247c-e81c-5fae-b5e7-f5a272b5c982.html.

I learned about who Miller Reese Hutchinson was through this source and used his image and their description of Hutchinson from the source.

William Kennedy Dickson at Historic Camera, http://historiccamera.com/cgi-bin/librarium2/pm.cgi?action=app_display&app=datasheet&app_id=2512.

I learned about who William Kennedy Dickson was through this source and used his image and their description of Dickson from the source.

Wolski, Tamara. The World's Columbian Exposition's Lasting Effect on Chicago. *Historia*, 2010, www.eiu.edu/historia/2010Wolski.pdf.

I found this article while researching the Columbian Exposition. While most of the effects Wolski mentions were about structures and architectural changes, she did include some analysis on how Westinghouse and Tesla's light display made a lasting impression on the Exposition attendees and how it affected their beliefs in what technology can achieve. I included this among the short-term impact of the Currents War.