

GEORGE W. G. FERRIS
THE MAN WHO RE-INVENTED THE WHEEL

Britta C. Waller

“Ferris is a crackpot. He has wheels in his head.”¹

Even officials of the famous World’s Columbian Exhibition of 1893, such as the one quoted above, seemed to think that George Washington Gale Ferris’ idea for an industrial monument to rival the Eiffel Tower was far-fetched, if not downright insane. Yet, when it was finally finished, Ferris’ colossal wheel embodied the “can-do optimism” of the Exhibition,² America’s industrial dominance, the American dream and the flexibility of a capitalistic society. This paper will discuss turn-of-the-century America, how these times inspired the World’s Columbian Exposition, and the birth, demise and significance of the great Ferris wheel.

The 1890s and early 1900s were marked by a universal wish for a better world, and most of all, “a world without war.”³ Steel and iron were shaped into engineering marvels, such as the Ferris wheel, rather than weapons. Chicago’s World’s Columbian Exposition of 1893 commemorated the 400th anniversary of Columbus’ discovery of the New World and was the largest, most elaborate and most magnificent World’s Fair ever. The first international exposition was London’s Great Exhibition of 1851, boasting Joseph Paxton’s Crystal Palace—the first large scale iron and glass building and the ancestor of the modern skyscraper. The first American exposition was held in Philadelphia in 1876 to celebrate

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the country's centennial. However, it was the Paris Exhibition of 1889 that inspired the World's Columbian.⁴ Paris had produced the world-famous Eiffel Tower. America couldn't let Europe have all the limelight. In fact, this national rivalry was one of the prime moving forces behind the Fair. In addition, the Fair signified economic ambition, the rise of the city, and rapid progressive change.⁵ Ironically, there was a focus on cultural enlightenment and achievement. Buildings were in the "Greco-Roman-Oriental" style.⁶ Under the direction of Chicago architect Daniel H. Burnham and landscape architect Frederick Law Olmsted, the nation's best sculptors, architects, painters, writers and musicians joined with industrialists and inventors to put their best work into the Exposition. Its achievement in the arts far surpassed its historical significance: "We have put aside individual taste and have united in an effort to carry out the several parts of a design which...was dominated by one idea," wrote Professor Halsey C. Ives, the Chief of the Department of Fine Arts.⁷ The dual nature—industry and culture combined—of the Fair was a direct reflection of the era. Henry Steele Commager called the decade of the 1890s a watershed in American history:

On the one side lies an America predominantly agricultural; concerned with domestic problems; conforming, intellectually, at least, to the political, economic, and moral principles inherited from the 17th and 18th centuries... On the other side lies the modern America, predominantly urban and industrial; inextricably involved in world economy and politics... experiencing profound changes in population, social institutions, economy, and technology; and trying to accommodate its traditional institutions and habits of thought to conditions new and in part alien.⁸

The cultural idealism of the Fair was embodied in its alternate title: "The White City," so named because of a substance called "staff" which covered many buildings. Composed of plaster of Paris and jute fibers, staff closely resembled white marble.⁹ Author William Dean Howells praised the Fair as "the perfect embodiment of human ingenuity and Christian brotherhood—the ideal of Grecian democracy in industrial America."¹⁰ Howells saw the Fair as a glimpse of the future of America, and as a departure from the "Age of Accumulation"—a term he used to denounce the period before World War I.¹¹

However, Howells' altruistic ideals were pushed aside in favor of the Midway Plaisance, and its Queen—the Ferris Wheel.

Early in 1892, Ferris sat quietly at Burnham's planning session for the fabulous exposition. A tunnel and trestle engineer and bridge builder from Pittsburgh, Ferris was 33 years old, tall, slim, and pale, with a bushy black moustache and a "resolute face."¹² Born the eighth child of a Nevada farmer, Ferris attended military school in Oakland, California at age 16 and attended college at Rensselaer Polytechnic Institute (RPI) in Troy, New York. Graduating in 1881, Ferris was said to have a great ability to meet a challenge. Burnham told those assembled at the planning session: "Mere bigness is not what is wanted...something novel, original, daring and unique must be designed and built if American engineers are to retain their prestige and standing."¹³ An evening soon after, Ferris sketched the design for his famous amusement ride on a scrap of paper at a Chicago restaurant. He determined all aspects of the wheel—size, number of passengers, price of admission—in his original sketch. He had "re-invented the wheel...big."¹⁴

Ferris's wheel was 264 feet high and supported by two 140-foot pyramid-shaped steel towers.¹⁵ The wheel was 26 stories high, taller than any building on the grounds. It weighed, fully loaded, approximately 1,200 tons, or as much as three Boeing 747s.¹⁶ Thirty-six passenger cars were suspended between two steel rims. Made of wood and iron, paneled with plate glass windows and furnished with swivel chairs, the cars were approximately the size of train passenger cars.¹⁷ The wheel had a total capacity of 2,160 people.¹⁸

The wheel was built on two 20-foot square, 35-foot deep concrete blocks. Plans were approved by the end of 1892. The thousands of parts needed for the steam powered wheel were built by five different steel companies. In late March of 1893, five trains, each thirty cars long, brought all these parts to Chicago.¹⁹ The most crucial was the huge axle—45 1/2 feet long, 33 inches in diameter, weighing 46 1/2 tons. Made by Bethlehem Iron Works of Bethlehem, Pennsylvania, the axle was the largest single piece of steel ever forged in the United States.^{20,21}

Ferris built his ride based on the principle of the bicycle wheel. Heavy steel rods acted as the spokes and pulled toward the axle to keep the wheel's shape. By using tension, Ferris was able to build a lighter, stronger and vastly larger structure than was ever before possible.²²

A twenty-minute ride, or two revolutions with six stops each time around, cost 50 cents. The wheel ran from 8AM to 11PM. At night, the wheel was lit by 3,000 electric light bulbs powered by a generator in the boiler house of the wheel.²³ One-and-one-half-million people had ridden the wheel by Fair's end—a good number considering that the 50 cent fee was equal to admission to the entire Exposition.²⁴ One North Dakota farmboy wrote in a letter home: "Do whatever you have to do—even sell the kitchen stove—come to Chicago and ride the Ferris wheel!"²⁵ A ride on the wheel, it was said, "may truly be called a round trip."²⁶

Though an engineering milestone when completed, the Wheel was not so well accepted in the early stages of its development. Burnham said it was not strong enough to withstand Lake Michigan winds, and even if it could, the public would be afraid to ride such a "rickety-looking contraption."²⁷ Others doubted the wheel, too, but Ferris was finally allowed to build it if he could finance it. The Exposition had no better match for the Eiffel Tower. Ferris sold stock to wealthy Chicago businessmen.²⁸ The wheel cost \$400,000 to build, and turned a total profit of \$733,086.²⁹

The Exposition was opened on May 1, 1893 by President Grover Cleveland, but the wheel was not completed. Work was done around the clock, but safety was still ensured. The wheel was powered by two, 1,000-horsepower steam engines, one being held as a back-up.³⁰ It also had a huge air brake worked by two, 10 foot steel bands which would tighten to stop the wheel in case it began to spin free.³¹ With these features, the wheel was tested extensively. Wrote Ferris' partner and fellow RPI graduate William F. Gronau: "So perfect is the machinery that we did not feel the wheel move."³²

The Ferris Wheel had its grand opening on Wednesday June 21, 1893. Among the invited first riders were Mr. and Mrs. Ferris, the mayor of Chicago, and a 40 piece band, squeezed into one car.³³

The Ferris Wheel, and the Midway Plaisance where it was located were both immediate successes. The Midway was a grand street of international displays and buildings meant to show the everyday life, and oddities of all countries. The Midway was designed to "popularize" the Exposition, which it did very well, because many visitors enjoyed its atmosphere much more than the cultural attractions.³⁴ Ironically, Jackson Park, the location of the Midway, not the cultural Court of Honor, became the entrance to

the University of Chicago, or the “Grey City” as it was known at the time.³⁵ One anonymous limerick showed the true, educational value of the Fair to the University:

“Oh, there were more Profs than students,
but then we didn’t care;
They spent their days in research work,
their evenings at the Fair.
and life upon the Campus was one
continual swing,
We watched the Ferris wheel go round and didn’t do a thing.”³⁶

The Ferris Wheel’s popularity was due to the escape the Midway provided, both from real life and the overwhelming culture of the rest of the Fair. “No single enterprise on the Midway or the grounds proper approached it either in patronage or in wonderment.”³⁷ Couples rushed to be married at the top of the wheel, but the closest they got was the superintendent’s office on the ground below. Newspapers started rumors of the wheel losing parts which then supposedly hurled to the ground below; or they told of the mechanism locking in place, trapping the wheel’s passengers up in the air with no help. As this never happened, such publicity made the gigantic toy only more popular.³⁸

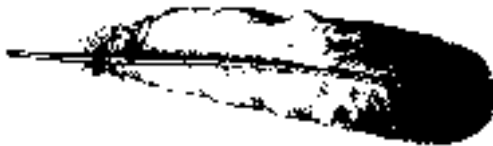
The wheel did have its critics. Howells accused the wheel of being a mere money-making contrivance—an exploitation of the visitors.³⁹ Others said Ferris had plagiarized the idea for the wheel, and that American, Oriental, and European history was filled with similar, if less complex, models. This is true, but it was the design that made Ferris’ creation unique.⁴⁰

Though not the first to build such rides, Ferris’ name was forever matched with later machines. British engineer W. B. Basset sought to outdo Ferris’ wheel in size and scope. American William Sullivan was also among those inspired by Ferris. Sullivan started the Eli Bridge Company in 1906 in Jacksonville, Illinois, largest current manufacturer of Ferris wheels. Sullivan, after riding the great wheel at the Exposition as many times as possible, capitalized on the commercial possibilities of the wheel. He made smaller, portable versions of about 45-feet in diameter which could be built in quantity.⁴¹ George and Mary Tilyou wanted to buy Ferris’ wheel and take it to their newly built Brooklyn amusement park—Coney

Island, which was modeled after the Midway. The Tilyou's couldn't afford the ride and instead built a 125-foot diameter "Wonder Wheel," which still stands. Though it wasn't the first or largest, as the signs claimed, Coney Island's Wonder Wheel established Ferris wheels and their many variations as a permanent fixture in modern American amusement parks.⁴²

The criticism over the wheel's originality began the wheel's decline. Ferris' assets collapsed over lawsuits with the Exposition about the wheel's profits. During the winter of 1893-94, the wheel was left deserted. With a brief appearance at the North Clark Street Fair beginning in early 1895, the wheel regained some of its original standing, but it had simply lost its novelty. Neighbors in Clark Street campaigned to remove the wheel, ironically, complaining of its "undesirable industrialism."⁴³ The wheel then appeared at the Louisiana Purchase Exposition of 1904 in Saint Louis and was still running perfectly. However, it remained unsuccessful. In 1906, following the Louisiana Exposition, the great wheel was brought tumbling down with 100 pounds of dynamite. The *Chicago Tribune* reported, "Within a few minutes, it was a tangled mass of steel and iron forty feet high."⁴⁴ However, Ferris was not there to see its end. In November 1896, George W. G. Ferris had died unexpectedly in a Pittsburgh hospital at the age of 37. The cause was diagnosed as several different ailments, but mostly Ferris' death was due to depression over his potential bankruptcy and loss of hope.⁴⁵

The true achievement of the Ferris wheel lay not in how long it stood, but in its combination of pleasurable enjoyment and industrial achievement. It symbolized the ideals of the World's Columbian Exposition. Moreover, the Ferris wheel signified the industrial advancement of the times and provided an escape in the peaceful period before World War I.



- ¹ Norman D. Anderson and Walter R. Brown, Ferris Wheels (New York, 1983), p. 16
- ² Jack Fincher, "George Ferris Jr. and the Great Wheel of Fortune," Smithsonian, July 1983, 14:109
- ³ Ibid., 14:109
- ⁴ David F. Burg, Chicago's White City of 1893 (Lexington, Kentucky, 1976), p. xii
- ⁵ Reid Badger, The Great American Fair (Chicago, 1979), p. 10
- ⁶ Fincher, p. 110
- ⁷ The Dream City: A Portfolio of Photographic Views (St. Louis, Missouri, 1893), n.p.
- ⁸ Burg, p. xiii
- ⁹ "World's Columbian Exposition," Encyclopedia Americana, 1989, p. 533
- ¹⁰ William Dean Howells, Letters of an Altrurian Traveller (1893-1894) (Gainesville, Florida: Scholars' Facsimilies and Reprints, 1961), pp. vii-viii
- ¹¹ Ibid., p. xii
- ¹² Fincher, p. 110
- ¹³ Ibid., p. 110
- ¹⁴ Ibid., p. 110
- ¹⁵ Burg, p. 224
- ¹⁶ Fincher, pp. 111-112
- ¹⁷ Burg, p. 224
- ¹⁸ William H. Lee, Beautiful Scenes of the White City (Chicago, 1894), n.p.
- ¹⁹ Anderson and Brown, p. 18
- ²⁰ Lee, n.p.
- ²¹ Anderson and Brown, p. 18
- ²² Ibid., p. 17
- ²³ Ibid., p. 24
- ²⁴ Fincher, p. 114
- ²⁵ Anderson and Brown, p. 26
- ²⁶ Lee, n.p.
- ²⁷ Fincher, p. 112
- ²⁸ Ibid., p. 112
- ²⁹ Kate Holliday, "Big Wheels of the Fun Business," Popular Mechanics, March 1969, 131:229
- ³⁰ Anderson and Brown, p. 21
- ³¹ Fincher, pp. 111, 114
- ³² Anderson and Brown, p. 23
- ³³ Badger, p. 109

- ³⁴ Ibid., p. 90
³⁵ Ibid., p. 157
³⁶ Ibid., p. 108
³⁷ Fincher, p. 114
³⁸ Howells, p. 25
³⁹ Fincher, p. 115, 116
⁴⁰ Anderson and Brown, pp. 37-38
⁴¹ Ibid., p. 41
⁴² Fincher, p. 117
⁴³ Ibid., p. 117
⁴⁴ Ibid., p. 118
⁴⁵ Ibid., p. 118

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An informative juvenile book which gives detailed facts of Ferris' life, earlier historical versions of the "pleasure wheel" and later variations on Ferris' design. Includes many original photographs and sketches from the World's Columbian Exposition.

Badger, Reid. The Great American Fair (Chicago: Nelson Hall, 1979)

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Burg, David F. Chicago's White City of 1893 (Lexington, Kentucky: The University Press of Kentucky, 1976)

Excessively thorough collection of facts on Chicago in the late 19th century and on the Columbian Exposition. Insightful and concise preface by author presents important ideas concerning the Exposition's significance.

The Columbian Gallery (Chicago: The Werner Company, 1894)

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