A Brief History of the Origins of Monorails

Beginning with the World’s 1st Monorail in 1825

And

Culminating in 1929

Please note many monorails have been created successfully and unsuccessfully since 1929, many of which are still in operation today. Due to time constraints, information created in this document comes from the Internet without authentication due diligence.
1825 - Cheshunt Railway

The first passenger carrying monorail celebrated a grand opening June 25th, 1825. It had a one-horse power engine...literally. Based on a 1821 patent by Henry Robinson Palmer, the Cheshunt Railway was actually built to carry bricks, but made monorail history by carrying passengers at its opening.

1876 - Philadelphia Centennial

General Le-Roy Stone’s steam driven monorail was first demonstrated at the United States Centennial Exposition in 1876. The ornately designed double-decker vehicle had two main wheels, the rear one driven by a rotary steam engine.
1876 - Sonoma Prismatical

This 7-mile wooden monorail was proposed to be the first rail line built to connect the Northern California city of Sonoma with a steam ship landing at San Pablo Bay. Only three and a half miles were built, between Norfolk and Sonoma. The line operated from November 23, 1876 to May 5, 1877. The company went into bankruptcy that year. The track was 15 inches high and cost $4,500 per mile to build, half the cost of narrow guage railroads of the time. Promoter Joseph S. Kohn's plans to extend it to Sonoma Landing on the Petaluma River were never realized. Kohn also proposed an elevated prismatical rail for San Francisco along Market Street, but land owners along the line objected.

1878 - Bradford & Foster Brook Monorail

A modified version of General Stone's Centennial monorail was put into use on a 6.4 kilometer line between Bradford and Gilmore, Pennsylvania. It was built to transport oil drilling equipment and personnel to Derrick City. Wayside stations were added at Tarpot, Babcock's Mill and Harrisburg Run. At that point, local inhabitants began to ride the line. The rotary engines lacked power and it was decided to gamble on a much larger locomotive driven by conventional pistons. The worst disaster in monorail history occurred on January 27, 1879 with this engine. Coupled to a flat car full of officials, the train was run at high speed to demonstrate its capability. The boiler exploded and the train crashed into a creek, killing the driver, fireman and three passengers. The rest were severely injured. The line was abandoned shortly thereafter.

Source: http://www.monorails.org/tmspages/History.html
1886 - Meigs Monorail

Captain J.V. Meig’s monorail made it as far as having a test track, but the design was so far ahead of its time that it never caught on. Who could have imagined that aerodynamics would be considered as early as 1886?

1886 - Enos Electric Railway

The Enos Electric Railway, the first suspended monorail, was tested and demonstrated on the grounds of the Daft Electric Company in Greenville, New Jersey in 1886. It was built of light, open steelwork rather than massive wooden beams that most monorails to this point had used. The Greenville demonstration attracted considerable publicity in the press, but no major system was ever built. The design may have influenced Eugen Langen in Germany, as the Enos Monorail bears a remarkable likeness to the Wuppertal Schwebebahn in Germany.

1888 - The Listowel & Ballybunion Railway

The Lartigue Railway Construction Company opened a 14.5 kilometer steel-railed monorail on March 1, 1888. It linked the town of Ballybunion, on the west coast of Ireland, with the market town of Listowel. The only passenger-carrying monorail in the British Isles for many years, it ran until 1924. Rising operational costs and road transport forced it out of business.

Source: http://www.monorails.org/tmspages/History.html
1901 - Wuppertal Schwebebahn

Civil Engineer Eugen Langen of Cologne, Germany has left his mark on the history of monorails in a big way. His Schwebebahn (suspension railway) has operated successfully along the Wupper river for almost 100 years. It has survived two world wars and continues to operate profitably and safely today. For more photographs and a full-length article, see our Links page.

1909 - Brennan Monorail

Louis Brennan patented his invention for a gyroscopically-balanced car in 1903. A full scale demonstration was presented to the press on November 10, 1909 at Gillingham, England. It was built primarily as a military vehicle due to the high speed at which track could be laid. Even with passengers all on one side of the vehicle, the two onboard gyroscopes were strong enough to keep the car level. Despite a series of successful demonstrations to scientists, engineers and military officers, the fear that the gyroscopes might fail prevented Brennan's invention from ever being used for transportation.

1911 - William H. Boyes Monorail

This test track was built and demonstrated in 1911 in the tidelands of Seattle, Washington. The rails were made of wood and track cost was estimated to be around $3,000 per mile. A bargain! The Seattle Times commented at the time that "the time may come when these wooden monorail lines, like high fences, will go straggling across country, carrying their burden of cars that will develop a speed of about 20 miles per hour." Like so many inventions, lack of financial backing prevented further development.
1914 - Genoa Monorail

Built for the 1914 "Esposizione Internazionale di Igiene, Marina e Colonie" exposition, this straddle-type monorail looks like a close cousin of many of today's Alweg-based monorails. The "Telfer" Monorail had coaches the size of railway cars and was conceived as a mass transit system demonstrator. The line linked the exhibition site with a central square of the city. The train was built by the Italian manufacturer Carminati & Toselli and consisted of 4 coaches for passengers, with an electric locomotive located in the middle. The monorail only operated for a couple of years and was then dismantled.

1924 - The Magnesium Monorail

One of the last Lartigue-based monorails was built by the Sierra Salt Corporation. It carried magnesium salts from their mine in the Crystal Hills to the Trona railhead in California. The route lay across the rugged terrain of the Saline Valley in Inyo County. The line was a great success until more modern ways of extracting magnesium put the mine company out of business two years later.

1929 - The Bennie Railplane

While railroad engineering stagnated between the world wars, one unique demonstration line was built by Scottish engineer George Bennie. The short test track was built over a railroad line near Glasgow, Scotland. Two electrically-powered propellers delivered 240 horsepower in a short burst for acceleration to the cruise speed of 160 kph. There were plans for a high-speed link between London and Paris, with a seaplane to carry passengers across the English Channel, but the grave economic difficulties of the 1930's doomed the Railplane from the start.

Source: http://www.monorails.org/tmspages/History.html
The Bradford & Foster Brook Monorail of 1878

This machine, with its twin chimneys, looks like it might have had some inspiration from The Lartigue Monorail, but actually it was a modified version of General LeRoy Stone’s Centennial Monorail; the Lartigue came later. Like Stone’s locomotive, the original Bradford locomotive appears to have had a rotary steam engine, but no details are known. However, it was clearly short of power, because later engines used the more effective piston drive.

This monorail was operated on a four-mile line between Bradford and Gilmore, Pennsylvania, USA; it was chartered in October 1877. It was intended to transport oil drilling equipment and its workforce, but before long was transporting local passengers as well.

Eli Perkins, who travelled on the line in February 1878, wrote: “The locomotive is a queer looking thing. An Irishman here compared it with a gigantic pair of boots swung over a clothes line. The boiler is without a flue, the engine without a piston, and the driver without a crank. I rode with General Stone around corners and up steep grades as thirty miles an hour.”

From "History of the counties of McKean, Elk, and Forest, Pennsylvania" by J H Beers & Co. The speed reported was widely disbelieved, and Perkins’ account is also undermined by the fact that the railway had no corners, and little or nothing in the way of grades. However it is interesting to note that General Stone was taking an interest.

The Bradford-Gilmore line was the scene of the worst disaster in monorail history, on the 28th of January, 1879. A new and larger piston-driven engine was being demonstrated, pulling a flatcar full of officials. The train was being run at high speed to demonstrate its capabilities; the boiler exploded, apparently due to too low a water level, and the train crashed into a creek, killing George Grogan, (conductor) John Vaughn, (engineer) John Addis, (brakeman) Charles Shepherd, (assistant superintendent) Michael Hollivan, (fireman) Thomas Luby. (engineer) The three surviving passengers, Sterret, Peterson, and Gartside were seriously injured. The line closed shortly afterwards; in February 1879 it was sold to Allen & Skidmore, and in March 1880 it was disposed of at a ‘sheriff’s sale’. (This is a public auctions to satisfy legal judgments, usually conducted under the authority of the sheriff of the county or city in which the property to be auctioned was seized pursuant to the judgment) This disaster is in contrast to the resilience of the Lartigue monorail, which proved highly resistant to deliberate sabotage in Ireland.

Source: http://www.douglas-self.com/MUSEUM/LOCLOCO/bradford/bradford.htm
A later locomotive of the Bradford & Foster Brook Railroad: 1878

From A Locomotive Engineer’s Album
George B Abdill 1965

This 0-4-0 locomotive looks like a much more professional job than that illustrated above. It was built by Baldwin in 1878, with shop number 4370. It balances on a single rail, with outriggers holding small wheels that press against rails at the bottom of the picture, in order to keep upright. It differs from the Lartigue system in that the top rail is supported by a column rather than an A-frame, so the two lower rails are close together.

Col. A I Wilcox was the president of the company.

I suspected at first that this might have been the locomotive that exploded; certainly it is piston driven. However according to "History of the counties of McKean, Elk, and Forest, Pennsylvania" by J H Beers & Co, the accident happened during a trial of a new locomotive built by Gibbs and Sterrett. As noted above, Sterrett was one of the injured.

Note the long cylindrical tank slung below the locomotive with "Bradford & Foster Brook Railway" written on it; this presumably held water. It is not clear from the photograph but no doubt there was another such tank on the other side.

The Bradford & Foster Brook Railway was one of, if not the first, monorails in America. Inspired by a working demonstration at the Philadelphia Centennial Exposition of 1876, Col. Roy Stone thought it would solve transportation problems near Bradford. In 1876, Bradford was a booming oil town with thousands of dollars worth of machinery and oil supplies awaiting delivery. Because of very muddy road conditions, deliveries to the oil fields were delayed. Construction of the railroad was already started by October 31, 1877, when the Railway Corporation was founded.

The railway consisted of a series of piles driven into the ground connected by 12" square timbers upon which set a single rail. Exactly three feet below the railhead was a stringer on each side. This stringer bore a wear strip upon which the rail cars pressed a wheel for balance. Road crossings operated like a fence gate, as did switches.

A variety of engines were constructed for the railway. The first engine had twin boilers and sat low on the rail. It wore out quickly, and was replaced by a heavier engine of more conventional single-boiler design. This engine had only two drivers and bore heavily on the rail, crashing through on its fourth trip along the railway. No one was hurt in the accident, although several people had to be fished out of the stream with some hazard to their dignity. That engine may or may not have continued to operate, however by the beginning of the next year, a third locomotive had been constructed, again using twin boilers.

This third locomotive had used boilers. They were tested to their specifications, however on the engine's trial run, one boiler ran dry and when too much water was introduced by an inexperienced fireman, the excess steam caused that boiler to explode, killing 6 people, and putting an end to the railroad.

Source: http://en.wikipedia.org/wiki/Bradford_and_Foster_Brook_Railway