

= Givors canal =

The Givors canal (French : Canal de Givors) was built between 1761 and 1781 to carry coal , other goods and passengers from Rive @-@ de @-@ Gier to Givors on the Rhone , running beside the Gier river .

The canal was approved in 1760 and after many problems opened in 1780 . The canal was originally 15 kilometres (9 @. @ 3 mi) long . Goods were loaded on flat barges that could carry several tons . It took about 18 hours for two or three men to pull a barge through the canal . The Givors canal played an important role in the early industrialization of Givors and the Gier valley , and became highly profitable . At its peak , in 1827 , the canal transported 332 @, @ 000 tons .

The canal became obsolete when the Saint @-@ Étienne ? Lyon railway , the first passenger railway in France , was built in 1828 ? 33 along the same route . In an attempt to compete , in 1839 the canal was extended to 20 kilometres (12 mi) long , with 42 locks to raise or lower boats moving between the sections of level water . Despite the extension , traffic volumes slumped , although the canal was kept open until the start of the 20th century . Little now remains of the canal , which has mostly been covered by the A47 autoroute between Givors and Saint @-@ Étienne .

= = Plans = =

The original plan conceived by Alléon de Valcourt in 1749 was to build a canal that would link the upper Loire to the Rhone . The route would run through the Gier basin from Givors on the Rhone most of the way to Saint @-@ Étienne , then through the Saint @-@ Étienne basin to Saint @-@ Just on the Loire . It was sometimes called the Canal des Deux @-@ Mers (Two @-@ Seas Canal) since it would link the Atlantic and the Mediterranean .

A more immediate need for a canal covering the section between Givors and Rive @-@ de @-@ Gier emerged in the 1750s , when a cheaper method than pack mules was needed to carry coal to heat houses in Lyon and to fuel the glass works that had been opened in Givors in 1749 . In 1751 , there were 1 @, @ 200 mules engaged in carrying the coal from Rive @-@ de @-@ Gier to Givors , from where it was taken by water north to Lyon and south to the towns of the Midi . Lyon was consuming 36 @, @ 000 tons annually . The coal sold for 5 francs a ton at the mine head and 21 @. @ 70 francs per ton at the Lyon docks .

The watchmaker and engineer François Zacharie proposed to connect the Loire to the Rhone by a navigable canal 56 @. @ 2 kilometres (34 @. @ 9 mi) long that would mount the Gier and its tributary the Janon , cross the watershed at Saint @-@ Etienne and descend the Furan to exit on the Loire near Andrézieux . He filed his proposal early in 1758 , and had to wait in Paris until 28 July 1760 for a favorable report from the Conseil du Roi .

Letters patent were issued to François and Guillaume Zacharie on 6 September 1761 giving them the right to build and then use the canal for forty years , after which it would revert to the crown . They would be responsible for building bridges for the roads cut by the canal and for paying for the lands taken . The letters @-@ patent were not registered in Parliament until 6 June 1768 . Zacharie was only authorized to open the channel from Givors as far as Rive @-@ de @-@ Gier , a rise of 80 metres (260 ft) .

= = Construction = =

Work began on the canal in 1763 . When water was let into the first section of the canal in 1764 the side walls of a lock chamber collapsed . Zacharie had to borrow money to continue . In 1766 , to satisfy his creditors , he prematurely opened the canal . The water broke the banks and the participants in the ceremony had to scramble to escape . Work was halted with the canal reaching only to Saint @-@ Romain @-@ en @-@ Gier . In 1768 , Zacharie died penniless of a heart attack .

Zacharie 's death threatened to disrupt the project , but King Louis XVI of France was personally interested , and Zacharie 's oldest son , Guillaume , was allowed to resume the work . On 14

December 1771 , new letters patent were given to Guillaume and his partners , replacing the earlier ones . Under the new terms , all the land needed could be expropriated including two toises , or 3 @. @ 6 metres (12 ft) , of land on either side for tow paths . The builder could take materials wherever they could be found .

The king appointed an engineer to oversee construction , and an inspector of roads and bridges , to be paid by the concessionary . The concessionary and his heirs , successors and assigns would enjoy the canal for sixty years before transferring it to the king . He could deploy as many boats as he chose , being paid defined fees for the weight and distance of goods carried , and for passage of empty boats through each lock . Passenger fees were also defined . He could deploy armed guards to enforce regulations .

The project continued to run into difficulties with malfunctions , financial problems and threats of work stoppages . New letters patent were issued on 12 August 1779 that doubled the rates and extended the term to ninety @- @ nine years . The concessionary could now also expropriate land for shops , warehouses and housing for employees . The work was complete in May 1780 and was finally opened for navigation from Givors to Rive @- @ de @- @ Gier the following December . The concessionaries reported that they had spent six million francs , but the canal probably cost much more .

The canal from Givors to Rive @- @ de @- @ Gier had nine aqueducts and 16 bridges . At Tartaras a tunnel 100 metres (330 ft) long and 5 metres (16 ft) wide had been broken through solid rock . The canal was 15 kilometres (9 @. @ 3 mi) in length , and had 26 locks , several of them double . It was 1 @. @ 8 metres (5 ft 11 in) deep , and could accommodate vessels 2 @. @ 8 metres (9 ft 2 in) high . The maximum length of vessels was 22 @. @ 5 metres (74 ft) and maximum width 4 @. @ 65 metres (15 @. @ 3 ft) .

= = Operation = =

The canal had to contend with initial opposition from the carters , who used force to prevent coal being taken from the pits to the loading points . However , the canal provided a greatly superior method of transporting coal and was an immediate success . In 1782 it earned 114 @, @ 000 livres . The Compagnie du canal de Givors was established in December 1788 to take over operations . In letters @- @ patent of December 1788 , registered on 5 September 1789 , the concession was declared to be permanent .

Goods were carried on sicelandes , flat wooden boats about 20 to 22 metres (66 to 72 ft) long that could carry several tons . They were hauled by two or three margoulines , men who walked on the towpaths pulling the barge with a harness over their shoulder . It took about 18 hours to pull a barge through the canal . A marinier stood on the front of the barge steering it with a wooden pole . Lock @- @ keepers operated the locks and helped manoeuvre the barges using a boat hook . Porters loaded and unloaded the barges . They were called crocheteurs after the iron hooks that they used to move bales of goods .

The combination of the glass works and the canal transformed the sleepy rural village of Givors into an industrial town . The canal and the river both helped Givors distribute its manufactures . By the time the French Revolution began in 1789 Givors had 2 @, @ 800 inhabitants . Its nodal position , later reinforced by construction of various railways , explains the development of the glass works and later of iron and steel manufacture .

In December 1788 , King Louis XVI approved construction of a reservoir to supply water to the canal in dry periods . François Zacharie had proposed a site for the reservoir high up near Saint @- @ Etienne , but the chosen site was low down on the Couzon river near to Rive @- @ de @- @ Gier . This short @- @ sighted decision ruled out the plan to continue the canal up to Saint @- @ Etienne and then down to the Loire . The French Revolution (1789 ? 1799) delayed the work , but the Barrage de Couzon (Couzon Dam) was completed in 1809 , capable of containing 1 @, @ 000 @, @ 000 cubic metres (35 @, @ 000 @, @ 000 cu ft) of water . It was modeled on the dam built at Saint @- @ Ferriol for the Midi canal .

In 1821 , revenue was 816 @, @ 444 francs , and the company paid a dividend of 555 @, @ 500

francs . The company was able to raise its rates without reducing traffic . In 1822 , the canal earned almost a million francs from carrying 243 @, @ 200 tons of coal and 96 @, @ 000 tons of other merchandise . The concession holders had repaid most of the debts they had incurred to build the canal , including many improvements since it was opened , and were able to pay healthy dividends . By 1824 , the canal was giving annual revenues of 850 @, @ 000 francs . An 1824 account described a superb water station at Givors on the right bank of the Rhone , an excellent basin at Rive @-@ de @-@ Gier for loading , fine buildings for administration of the canal and spacious shops and warehouses .

In 1827 , at its peak , the canal transported 332 @, @ 000 tons . The main purpose of the canal was still to transport coal to Givors , from where it could be taken to other towns on the river Rhone . On the return trip , boats carried some of the merchandise of the Midi including iron , oak wood and other things needed by the factories of the Loire department . By 1831 , the population of Givors had risen to 9 @, @ 210 . There were many factories making window panes , bottles and glasses , and the port had a busy trade in coal shipment . Ten large glass works had been established at Rive @-@ de @-@ Gier that also transported their products by the canal .

= = Railway competition = =

The canal 's high tariffs and excellent profits attracted interest in building a competing railway . This was a bold venture . Planning for the Saint @-@ Etienne railway preceded the Liverpool and Manchester Railway , opened in 1830 , which was used as the prototype by other pioneering railways , so many new technical problems had to be solved . In fact the steep section from Rive @-@ de @-@ Gier to Saint @-@ Etienne was beyond the power of steam traction engines of the day .

Construction of the Saint @-@ Étienne ? Lyon railway began in September 1826 under the direction of Marc Seguin . The section between Givors and Rive @-@ de @-@ Gier was open for freight traffic on 28 June 1830 . The wagons were drawn up the slope by horses . One horse could pull five or six empty wagons at about 3 kilometres per hour (1 @. @ 9 mph) . On the downhill return journey , the horses were placed in wagons , and the 22 kilometres (14 mi) distance could be covered in an hour . In early 1831 the steam locomotive Seguin came into operation , able to tow seven cars loaded with 21 tons or up to 28 empty cars from Givors to Rive @-@ de @-@ Gier in an hour and a half . The full line from Saint @-@ Étienne to Lyon was open for goods and passengers on 4 April 1833 .

The population was hostile to the railway since it threatened many trades . Trains were derailed and wagons set on fire . In 1835 the poet Guillaume Roquille published his Franco @-@ Provençal language collection Ballon d ? essai d ? un jeune poète forézien (Trial balloon of a young Forézien poet) . He violently attacked the arrival of the Saint @-@ Étienne ? Lyon railway , which would ruin the canal on which his father worked as a porter . The canal company responded to competition by lowering rates but still lost business . They had steam boats built in England that could tow barges from Givors to Lyon , avoided the expense of transferring the coal to river boats . On 3 December 1831 a royal ordinance allowed the company to extend the canal west to La Grand @-@ Croix . Work began at once and was completed in 1839 . The 5 kilometres (3 @. @ 1 mi) extension brought the length to 20 kilometres (12 mi) and the number of locks to 42 .

However , economics were on the side of the railway . An 1836 report noted that coal had never been carried directly from Saint Etienne to Lyon using the canal . It would first have to be carried by land for 18 to 20 kilometres (11 to 12 mi) , then for 16 kilometres (9 @. @ 9 mi) by the canal , and then up the Rhone for 20 to 22 kilometres (12 to 14 mi) . With the opening of the railway , all the coal could be carried non @-@ stop by the much cheaper land route . Only the mines of Rive @-@ de @-@ Gier had use for the canal , and for those mines the charges were excessive .

= = Obsolescence = =

The canal was leased to the Compagnie des Mines de la Loire on 1 January 1846 . Tonnage had

fallen from 246 @, @ 000 tons in 1830 to 172 @, @ 000 tons in 1840 . It rose to 238 @, @ 000 tons in 1850 , then resumed its decline : 146 @, @ 000 tons in 1860 , 82 @, @ 000 tons in 1870 and 24 @, @ 000 tons in 1878 . Until the end of the 19th century the municipality of Givors held that the canal was essential to development of the town , and that barge traffic was still a viable industry , fighting against closure of the canal and demanding that it remain navigable for its entire length despite mounting evidence that it was obsolete . However , by 1881 , it was clear that the canal was in poor shape . The natural shores were eroded and the sides of locks 1 ? 32 needed to be completely rebuilt . From locks 32 to 35 the canal was mostly silted up and in some places had disappeared completely , taken over by vegetable gardens .

The industrial development of the Gier valley had its negative aspects . An 1884 writer described the region of Échalas and Saint @-@ Romain @-@ en @-@ Gier , where the country was furrowed by the river , the canal , the railway and the national road . He described the people as the most miserable in the canton of Givors . He said that everything showed this misery : agriculture , roads , houses , church . Work in the mines was the only choice for the poor villagers . An 1885 travel guide mentions the station of Givors @-@ canal on the railway south from Lyon , where the Nîmes line separated from the line to Saint Etienne . The canal then was mainly used by coal barges . The route from Givors @-@ Canal to St. Etienne passed coal mines , large smelting works and iron foundries .

The canal company went bankrupt and was bought by the state in 1886 . This briefly gave it a new lease of life , but the canal had an obsolete gauge . By the start of the 20th century it was almost abandoned . The canal was neglected and parts were filled in . In the 1970s the A47 autoroute between Givors and Saint @-@ Étienne covered almost all the sections that remained , apart from the site at Tartaras where the double lock and tunnel have been preserved as a heritage site .