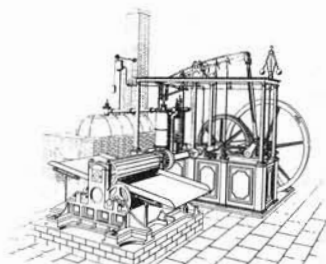




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COVER: The illustration on the cover is from *A Treatise on the Steam Engine* by John Farey (London, 1827). This ten-horsepower engine, built by Jukes Coulson and Company of London, is remarkably similar to the engine found in Haiti in 1927. Cornelius Von S. Roosevelt's interesting article on the Haiti engine begins on page 23.

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The Olean-Bayonne Pipeline

A Preliminary Survey

Edward J. Lenik

Introduction

Petroleum obtained from pitch deposits or from the earth's surface was known far in antiquity. It was used to caulk ships, as a lubricant, and even as a medicine. Not until the early nineteenth century was oil obtained from drilled wells, and this occurred purely by accident. The drillers were primarily after salt and because of this the petroleum was largely discarded. The discovery that kerosene could be distilled from oil, plus the demand for flammable liquids to fuel lamps, finally led to the deliberate recovery of petroleum. When the world's first oil well was drilled by Colonel Edwin Drake near Titusville, Pennsylvania, in 1859, the oil industry was on its way.

In the early days of oil recovery, tank cars from the Pennsylvania oil fields were the method of transporting crude oil. Kerosene was the principal end product and Eastern seaboard lamps, stoves and heaters were the market. However, in 1880, a pipeline connected western Pennsylvania to Bayonne, and with it, the era of mass movement of oil had begun.

Historical Background

In 1881, the Standard Oil Company built the first major pipeline system in the United States. This pipeline pumped oil through a single six-inch line from Olean, New York, to Bayonne, New Jersey, a distance of 315 miles (Figure 1). A second six-inch line was laid in 1882, a third in 1884, and finally a fourth in the late 1880s, which brought the total capacity of the system to over 50,000 barrels a day. A branch line was built from Garfield, New Jersey, to West New York on the Hudson River, which delivered oil to Standard Oil Company tank

farms and refineries in Long Island City and Brooklyn. Three lines connected the Saddle River station at Garfield with a tank farm at Bayonne.

The oil pipeline crossed fourteen rivers, twenty creeks, and eighty mountain peaks, and ran due east from Olean, New York until it swung to the south and crossed the New Jersey state line at Unionville. From that point it traversed northeastern New Jersey and continued down to Bayonne. Eleven sites along this route were selected for pumping stations, and were placed about 28 miles apart. During construction of the line, no attempt was made to bypass mountain ranges or to avoid river crossings. The line ran as straight as the terrain would permit and paralleled the Erie and the New York Susquehanna and Western Railroads to assure a constant supply of coal for the pumping stations.

Oil first began to move eastward from Olean to the Wellsville, New York station in July, 1880, where it was loaded on tank cars and sent to the seaboard. The last gaps in the Olean-Bayonne line were connected in 1881, but it was not until 1882 that the extension from the Saddle River station to the Hudson River crossing was completed.

The original pipeline under the Hudson River left the New Jersey shore at West New York and ran across the muddy bed of the river to the foot of West 79th Street, New York City, a distance of 4,600 feet. Warning signs were erected on both shores which read, "Pipeline Crossing—Do Not Anchor Here." To protect the crossing, Standard Oil had a dock at West New York with a cabin patrol boat, and a work scow which carried deep-sea diving equipment and spare anchors. Usually the company diver was able to detach snagged anchors before the strain broke the line, but in some cases, the anchor chain had to be cut and the ship supplied with a new anchor. The river line was patrolled daily to keep a

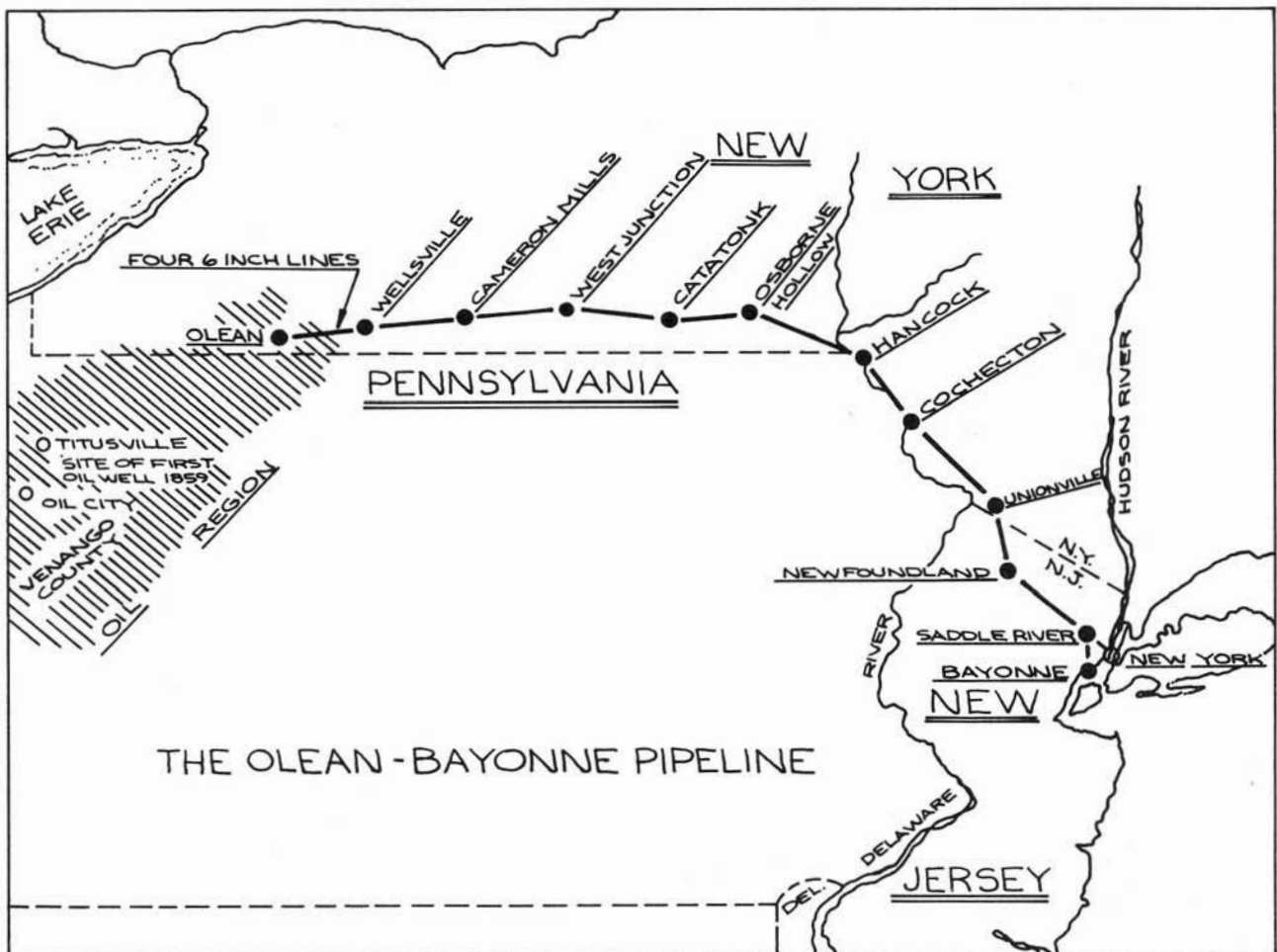


Figure 1. Map showing the Olean-Bayonne pipelines and pumping stations.

lookout for oil on the surface. Later, the Hudson River pipelines were relaid to West 97th Street, New York City.

In 1882, ownership of the pipeline was transferred to the National Transit Company, which was a subsidiary of Standard Oil of New Jersey. On January 8, 1892, the New York Transit Company was organized to take over all National Transit lines in New York and New Jersey.

The pipeline from West New York, New Jersey to Newton Creek was abandoned in 1921. The pipe was removed from the East River in 1921-22 and from the Hudson River in 1923. Following the abandonment of the river lines, oil was transported by barge to refineries in Brooklyn and Long Island City.

When the production of the eastern oil fields waned, the Olean-Bayonne line had to depend more and more on shipments from western oil fields. However, it was tanker competition that dealt the Olean-Bayonne line its

death blow. Short pipelines were built from the mid-continent oil fields to terminate on the Gulf Coast where oil was loaded on giant tankers that circled around Florida, and delivered crude oil to Atlantic Coast refineries cheaper and quicker than it could be moved through the 1,817 miles of pipelines stretching from Tiffin, Texas, via Olean, to New York harbor. By 1927 the flow of oil had fallen to 6,700 barrels a day, and company officials decided to shut down the pumps east of Olean. The last shipment of oil from Olean station was made on October 3, 1927.

The Pipeline

The pipe trenches from Olean to Bayonne were dug by teams of oxen and plows, and by men with picks and shovels with rocky sections in the mountains blasted with dynamite. Twenty-eight men made up a typical

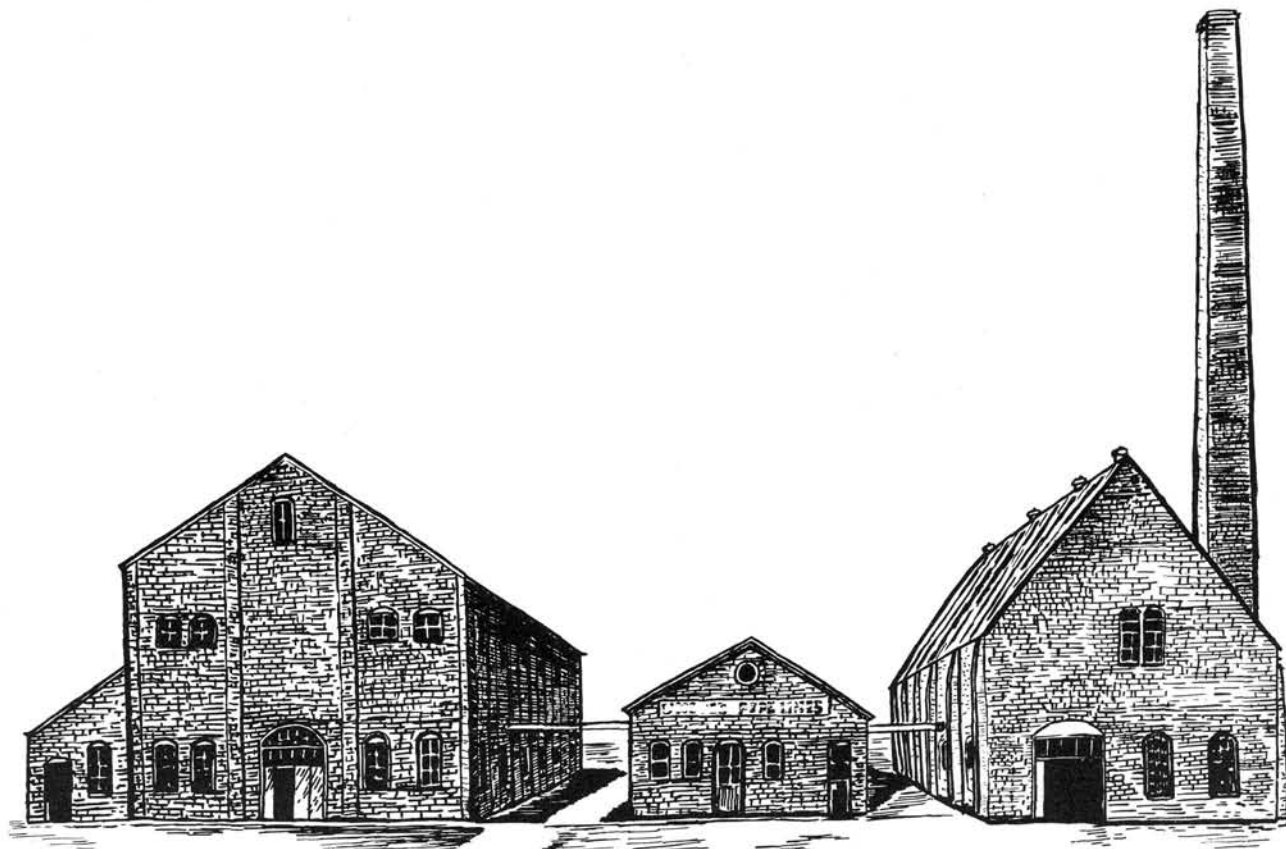


Figure 2. Sketch of typical oil pumping station.

pipe-laying crew. These men laid 200, eighteen-foot sections a day and were called "tong gangs."

The pipe was lap-welded wrought iron with long, heavy collars which tested to 1,500 pounds. The ends and sockets were cut on a taper with nine threads to the inch, making a perfect joint. The lines were buried eighteen inches in the ground, except on rocky terrain where they were simply laid on the surface. In very cold weather, the oil thickened where the pipelines were exposed and this retarded passage through the line. The problem that could not be determined in advance during construction was the lasting qualities of wrought iron pipe which would be buried in the ground and subjected to enormous strain.

The Hudson River pipeline was of heavy wrought iron with special couplings. A cast iron clamp, made in halves, was bolted around the pipe to increase the strength of the threaded joints, and the line weighted

down with heavy parallel chains and anchors.

The Olean-Bayonne line was patrolled daily by pipe-line walkers who covered the 28 miles between stations in two days. Each man carried a portable telegraph instrument, a pair of pole climbers, a hammer and a chisel, corking tools, a wire stretcher, a pair of pliers, plug boxes, and a hatchet. These patrols inspected the line for breaks, leaks, wash-outs and tampering. All trouble was reported by telegraph.

Due to changes in temperature, precipitation of paraffin caused wax to stick to the pipe walls, and reduced the quantity of oil passing through the lines. To clean the line, revolving "go-devils" were sent from station to station, traveling at the same speed as the oil. A go-devil was a device three feet long, slightly under six inches in diameter and weighing thirty pounds. It was made of brass, jointed in two places to enable it to traverse any angle or curve in the line. Revolving fins of

hardened steel, with leather cups screwed to a round steel plate, fitted tightly inside the pipe and scraped away the film of paraffin. When a go-devil was started through the line, men were assigned to follow it, guided by the rumbling sound which could be plainly heard on the surface.

If the patrols lost contact and the scraper stuck, the line had to be cut to recover the go-devil. Later, two go-devils were sent at intervals to jar loose the one that was stuck. When sweet and sour or light and dark oil was pumped through the same line, they were separated by two go-devils to prevent a mixture of the oils, an improvement over the previous method of using a five-foot spacing of water to separate the crude oil.

The Pumping Stations

Eleven pumping stations were built on the main route of the pipe line. Each station consisted of three iron-roofed red brick buildings (Figure 2). One building was 40' x 60' with a 115-foot brick stack for the boiler. The second building was the pump house and midway between the two was a small office building for the foreman and telegraphers. There were two 35,000-barrel iron tanks at each station into which oil was pumped, gauged, then forced to the next station. Loop lines made it possible to pump oil around a station, and bypass it if necessary. Water for the boilers was supplied by local creeks or rivers and occasionally by artesian wells. The fuel requirements for continuous operation of a pumping station were large, and a reserve coal supply was a necessity.

Pumping stations were equipped with duplicate boilers, engines, and pumps so that in case of a breakdown the streams of oil would continue to flow without interruption. Boiler houses were equipped with seven 80-horsepower steam boilers and a mercury gauge recorded the line pressure. Another gauge recorded each stroke of the pumps and registered the number of barrels of oil that passed through the station. The pressure on the main lines averaged 900 pounds. When the line was pumping 40,000 barrels of oil a day, 42,000 pounds of anthracite coal were used at each station; hence a saying developed, "A barrel of oil needs a pound of coal to keep it moving." Oil moved through the lines at an average speed of four miles an hour.

By 1902, the growing volume of traffic made it necessary to increase the number of steam boilers at each station from seven to nine, and to enlarge the pump houses to make room for two 1,000-horsepower Kline

engines and pumps. The Kline pump had eighty suction and discharge valves.

Eleven men were employed at each pump station working twelve hours a day—a foreman, two engineers, two assistant engineers, four firemen, and two telegraph operators. Add to this workforce other people such as line walkers, repairmen and family members meant that a substantial village grew up near each station. Two-story houses, alike in plan, were built at pump stations, and rented to employees for \$6.60 a month.

The Field Survey

When the Olean-Bayonne Line was abandoned the pipelines were sold to subsidiaries of the Columbia Gas and Electric Company. In November, 1928, the lines between Olean, New York and Unionville, New York were transferred to the Home Gas Company of Binghamton. Finally, in March, 1929, the lines in New Jersey were transferred to the Eastern Pipeline Company.

The pumps and engines and other equipment were sold to western pipeline companies, the telegraph lines to rural telephone companies, and some pumping stations were sold to highway departments and others to wrecking companies.

During a period of several months, an extensive archaeological field survey was conducted along the 315-mile route of the Olean-Bayonne Line. The purpose of this survey was to locate and record existing sites relating to the oil pipeline. The field work consisted of systematically walking or driving along sections of the pipeline right-of-way, and examining, photographing and recording the remains of the pipe, pumping stations, telegraph lines, bridge abutments, etc. Local residents were often consulted in the attempt to locate the remaining sites.

Almost all visible signs of this once great engineering effort have been eradicated. But for those who wish to explore, many of the original oil pumping stations still exist. Some of the sights and scenes along the route of the line are:

1. The *Olean, N.Y.* pumping station site was probably destroyed by the construction of the Southern Tier Expressway (New York Route 17). Little remains of this once active site except some outcroppings of brick and mortar among the weeds and a portion of a railroad spur along Route 17 just past the Olean exit. The site is presently owned by the Buckeye Pipeline Company.
2. No trace of the *Wellsville, N.Y.* pumping station was found in the course of the field survey. Also, Elm



Figure 3. Photo of postcard showing Standard Oil Pipeline Crossing and Susquehanna Railroad Bridge at Smith Mills, N.J.

Valley, which is located two miles east of Wellsville and was a large oil storage depot, also has disappeared without a trace. At one time, there were 79 huge red tanks at Elm Valley with a storage capacity of over 2½ million barrels of oil, but none could be found.

3. The pumping station at *Cameron Mills, N.Y.* is still standing and can easily be found. The original three red brick buildings are still there—the old boiler house, pump house, and foreman's office. The tall smokestack of the boiler house has been removed and all structures have been altered to some degree. The site is presently being used by the Steuben County Highway Department.

4. Early maps and records indicate that there was a pumping station at a place called "West Junction." However, this name has disappeared from usage as well as present-day maps of New York State. The site referred to is probably at *Horseheads, New York*, just west of Elmira. An early photograph has been found showing the pumping station and it is clearly labeled Horseheads, New York. Unfortunately, no evidence of this station could be found. In several areas nearby, the pipeline itself is being dug up and removed for its scrap value by the J. V. Construction Company, Elmira.

5. The boiler house and pump house of the *Catatonk, N. Y.* station are still standing. The small foreman's and telegrapher's building has been removed as well as the 115-foot boiler house smokestack. The remaining buildings are virtually unchanged and are presently being used by the Tioga County Highway Department. This site is located along Route 96 north of Owego, New York.

6. The next station heading east along the line was located at *Osborne* or *Osborne Hollow, New York*. Unfortunately, this name also has disappeared from usage and present-day maps. This oil pumping station was not located.

7. The *Hancock, N. Y.* oil pumping station can easily be found along Route 94 just a short distance west of town. The structures remaining at this site have been modified to some extent to accommodate a sawmill operation. The original roof of the boiler house has been removed and replaced with an arched metal one. However, the smokestack is still standing. The Hancock Station site is presently used to manufacture "rough" or unfinished baseball bats.

8. The ruins of the *Cochecton, N. Y.* pumping station lie between State Highway No. 94 and the Erie Railroad. Only the skeletal remains of what was once the boiler house remains. The roof of this structure has collapsed and the smokestack is gone. It was conveniently located near a fast-flowing stream undoubtedly to utilize the water for the boilers. Surface evidence can still be found of the pipeline itself as well as the railroad spur that brought in the coal.

Several homes of similar architecture are located immediately to the south of the Cochecton ruins. This little village was undoubtedly built to house employees of this pumping station.

9. A road sign near *Unionville, N. Y.* which reads "Oil City Road," is a visual reminder of the pumping station activity in this area. The original site is still standing just south of State Line Road. The pumping station is presently a plastics manufacturing company. However, no trace could be found of the tank farm in the area. There were nine 35,000-barrel tanks located here but they have been removed.

10. The *Newfoundland, N. J.* oil pumping station has been totally destroyed and a modern building and construction company storage yard cover the site. This station was located along the New York Susquehanna Railroad just south of N.J. Highway 23 in Newfoundland. Surface evidence of the site can still be found in the form of brick, mortar, ash and several circular earth embankments that originally enclosed the emergency oil storage tanks.

11. With the formation of the huge Pequannock Watershed in northern New Jersey, the oil pipeline running through the watershed area became a constant concern, as any leak would endanger the purity of the north Jersey water supply. Because of this fear, in 1916, a line

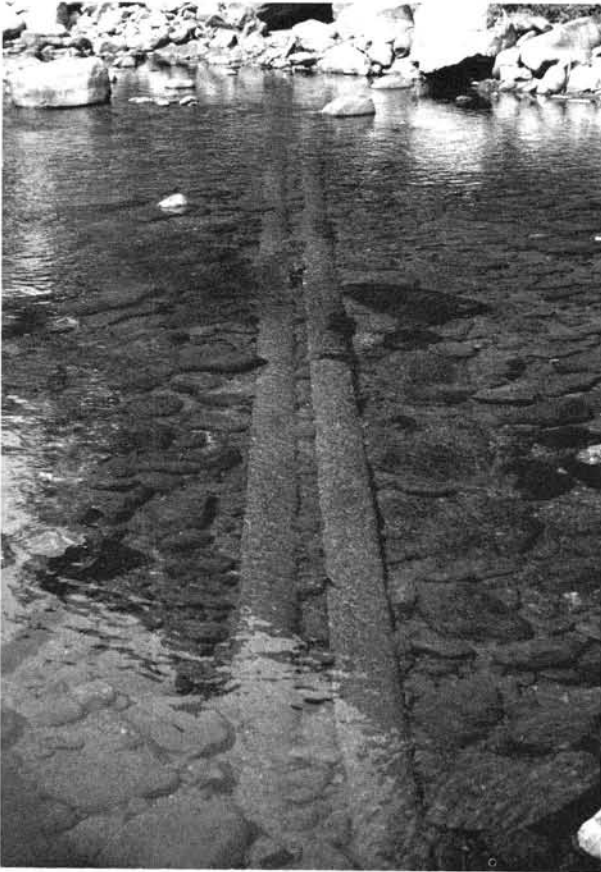


Figure 4. Remains of Standard Oil Pipeline in Pequanock River, Butler, N.J.

was built to bypass the watershed area. Along the top of Bearfort Mountain in *West Milford, New Jersey* the pipeline was encased in concrete in areas that were swampy. The pipe has been torn up and removed for the most part, but the route of the bypass can still be followed. An occasional section of the pipeline can still be found as well as the concrete casings and abandoned rotting telegraph poles.

12. At *Smith Mills, Butler, and Riverdale, New Jersey* the bridge abutments of the pipeline river crossings are still in existence. The pipeline in the area continued to parallel the Susquehanna Railroad and crossed the Pequanock River in several locations. Figure 3 is a photograph of an early postcard showing the pipeline crossing the river at Smith Mills, New Jersey.

13. The pipeline can still be seen lying in the bed of the Pequanock River just off the Hamburg Turnpike in *Butler, New Jersey*. Two 6-inch lines are clearly visible here (Figure 4). At several points along the abandoned

railroad right-of-way in Riverdale, New Jersey, the bank has eroded revealing sections of the Standard Oil pipeline.

14. There is no trace of the *Saddle River Pumping Station* in Garfield, New Jersey. This station was located in the southern part of the Borough near the now abandoned Hammersley Manufacturing Company. Extensive industrial and commercial development in this area has completely eradicated the site.

The Olean-Bayonne Pipeline was one of the most energy efficient systems for moving oil, but unfortunately it was abandoned and the pumping sites and pipes are being slowly and totally erased. The passage of time has proved that the Standard Oil engineers had done their job well. Despite being buried in the ground and subjected to enormous strain, the pipeline has survived for nearly a hundred years in remarkably good condition.

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