

Brady Street Bridge

(South Twenty-Second Street)

~~Brady Street~~ Bridge, 1895-96

Spanning the Monongahela River at the
Point of Pittsburgh
Pittsburgh
Allegheny
Pennsylvania

HAER PA-3

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APPENDIX
PITTSBURGH...

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

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HISTORIC AMERICAN ENGINEERING RECORD

SOUTH TWENTY-SECOND STREET (BRADY STREET) BRIDGE

PA-3

Location: Pittsburgh, Pennsylvania
UTM: 17.587080.4476110
Quad: Pittsburgh East

Date of Construction: 1895-96

Present Use: (Demolished May 29, 1978)

Significance: The Brady Street Bridge, contracted by the Schultz Bridge & Iron Co. of Pittsburgh, was a steel-riveted, through-highway bridge. The structure consisted of a tied arch for the central span with a suspended deck, and two through-trusses for the side spans. The bridge was the second to be owned by the city and the first free bridge in Pittsburgh.

Historian: James D. Van Trump, 1973.

NOTE: THIS RECORD ALSO SERVES AS THE HISTORICAL REPORT FOR PA-4 AND PA-5.

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FOREWORD

In Pittsburgh, everything begins at the Point in the flat peninsula of land between the two rivers that meet to form the Ohio. The land here thrusts away into the west, through and into the emergent and following waters, into the west which is a gate. That gate meant commerce and the opening of the continent beyond. The Point gave birth at first to forts, for the French, Duquesne; for the English, Pitts; the forts protected the developing commerce and having served their purpose, disappeared. Boats on the rivers were the earliest purveyors of commerce and for a season they carried the inhabitants of the Pittsburgh area across the dividing waters. But bridges became necessary, bridges -- those immemorial connectors -- were to appear at the Point, not at first, but gradually as the necessity for connection became apparent.

Bridges at the Point

Union Bridge (across the Allegheny River)

Begun - 1874
Opened to traffic - 1875
Demolished - May, 1907

Point Bridge I (across the Monongahela River)

Begun - July, 1875
Opened to traffic - April, 1877
Demolished - 1927

Manchester Bridge (across the Allegheny)

Begun - April, 1911
Opened to traffic - August, 1915
Demolished - summer and autumn, 1970

Point Bridge II (across the Monongahela)

Begun - April, 1925
Opened to traffic - June, 1927
Demolished - spring and summer, 1970

Fort Pitt Bridge (across the Monongahela)

Begun - November, 1953
Opened to traffic - 19 June, 1959

Fort Duquesne Bridge (across the Allegheny)

Begun - July, 1958
Main span and south approaches
Completed - April, 1963
Opened to traffic - 16 October, 1969

Brady St. Or South 22nd Street Bridge (across the Monongahela)

Begun - March 1895
Opened to traffic - March 1896

From the foundation of the first settlement at Pittsburgh until 1818 the only means of communication between the town and the further banks of the rivers was by canoe or skiff. As the settlement developed, some kind of ferry service became mandatory and in 1818 Jones' Ferry operated between the mouth of Liberty Street in Pittsburgh to the south bank of the Monongahela. Passengers were carried in skiffs while stock was taken over on flat boats. About 1840 the horse ferry was introduced in which blind horses, as a rule, were used as motive power--they were made to tramp upon a horizontal wheel, the revolutions of which propelled the boat across the stream.

A few years later Captain Erwin established a steam ferry from a point below the Point Bridge site on the south bank, but this was never a success. Subsequently the Jones' Ferry was abandoned and a steam ferry operated from Saw Mill Run on the south bank of Ohio to Penn Street in Pittsburgh.¹ This line was in use until the first Point Bridge was opened in 1877.²

Early Pittsburgh Bridges

No attempts were made early in the nineteenth century to bridge the rivers at the Point. The first bridges built were the Smithfield Street Bridge across the Monongahela (called in its early days simply the Monongahela Bridge) erected in 1818, and the St. Clair Street (later Sixth Street) across the Allegheny opened a year later.³ The former was a Burr-truss covered wooden bridge designed by Lewis Wernwa⁴ and built by John Thompson. The Allegheny span was also of timber and covered. These bridges, which were conveniently situated for commerce, could not carry all traffic as the century advanced, and among other sites the Point began to be considered for new bridge construction. Another wooden truss bridge was constructed in 1840 at Hand Street (Later Ninth Street) and at Mechanic's Street (later Sixteenth Street) in 1837--both across the Allegheny.⁵ Near the present Eleventh Street the canal aqueduct was erected in 1834, which was superceded in 1844-45 by John Roebling's famous wire suspension aqueduct.⁶ The Monongahela at Pittsburgh was not to be bridged by another highway span until the covered wooden bridge was built at South Tenth Street in 1861. At Pittsburgh the Ohio was unbridged until the twentieth century.

In the late eighteenth and early nineteenth centuries the three rivers at Pittsburgh presented rather a different appearance. Before the introduction of dams toward the end of the nineteenth century, the rivers at slack water were relatively shallow, and numerous islands and sandbars were in evidence. There was, for instance, a long sandbar in the Monongahela at the site of the Smithfield Street Bridge and two islands, Smokey and Kilbeck, near the north bank at the confluence of the rivers.⁷ It must be remembered also that there was an extensive traffic on all three rivers and the spans of the bridges had to be sufficiently high to allow boats to pass underneath them.

The coal interests in Western Pennsylvania were also particularly concerned with navigation on the rivers, especially the Monongahela, because it was the chief means of transporting coal from the mines in the southwestern part of the state. Certainly when bridges at the Point

were projected, the claims of navigation had to be respected and the height of the span and an unobstructed channel at the mouth of the Monongahela were of interest not only to local commerce but also to the United States government and the United States Army Corps of Engineers who were charged with keeping the navigable streams unobstructed.⁹

Early Point Bridges - Early Proposals

An important project in 1846 was to span the rivers at their junction with a tri-partite bridge, starting from the Point at the confluence of the two rivers, spanning with one trunk half of the breadth of the confluent streams and diverging on the breast of the bar into two trunks spanning also the Monongahela and Allegheny Rivers. A company was formed and chartered by the legislature¹⁰ and stock subscriptions were called for, one gentleman putting his name down for \$50,000. The structure was designed to cost \$300,000, but only 500 shares at \$500 each for a total of \$250,000 were authorized. Rivermen and their friends combated the project on the ground that it would result in the obstruction to the navigation of the rivers. A resolution favoring the construction of this bridge passed the Pittsburgh Select Council by a majority of one and the Select Council by a majority of two. An opposing resolution was passed by the minority in both councils. It was freely predicted that the necessary subscription could not and would not be raised. Whether this was the cause of the failure of the enterprise or whether the numerous railroads then projected usurped public attention and thus smothered interest in the tri-partite bridge would be difficult to state; at any rate, neither the necessary stock was subscribed nor the bridge built.¹¹ No plans or drawings for this project seemed to have survived.

According to another account the tri-partite bridge scheme was revived again in 1871. Charles Davis, the city engineer of Allegheny, Pennsylvania¹² submitted plans to a company formed at that time to carry out the project.¹³ It will be noted that the estimated cost was nearly a million dollars, considerably more than the earlier bridge. The writer, in this case, also has been unable to locate any surviving drawings or plans.

The undertaking failed only for want of proper support from parties who were directly interested in the bridge -- landholders whose property would have been greatly enhanced by the proposed connection.

The Union Bridge

No more attempts were made to bridge both rivers at the Point with a single structure. Shortly after the abandonment of the tri-partite scheme, an association of citizens with Mr. Joshua Rhodes as president applied for and obtained a charter for building a structure known as the Union Bridge from Allegheny to the Point. This bridge, which may also have been designed by Charles Davis, was constructed in 1874-75 and opened to traffic in the latter year.¹⁴

The Union Bridge was the last wooden highway river bridge constructed at Pittsburgh. It was a long Howe truss bridge with auxiliary arches and twin sidewalks.¹⁵ There were elaborate portals at each end which Allen says were stone, but which were probably constructed of wood to represent stone. It was constructed in five spans whose numerous piers were undoubtedly an obstruction to navigation and this factor, together with the low clearance of the spans, caused the eventual demolition of the bridge in 1907.¹⁶

A recent writer on Pittsburgh bridges, Mrs. Elizabeth Taylor Herbertson, has stated in her book that "the Manchester Bridge was also the site of the first rope span,"¹⁷ but this ambiguous statement has absolutely no foundation in fact. There was no bridge at the Point prior to 1874, as we have stated above.

The Point Bridge I: 1877

During 1874 while the Union Bridge was in process of construction, the question of a bridge to provide access from the Point to the South Side was much discussed in Pittsburgh City Councils. The Pittsburgh Daily Post reported on 16 June, 1874, that the first business of the Common Branch of Councils was to provide for a Point Bridge. "Certain individuals were opposed to the City erecting the bridge because of the great burden on the taxpayers. It was argued that the bridge might operate at a loss instead of paying for itself in a few years; were there enough residents at the Point to justify it--also at Temperanceville (a small settlement at the south bank of the Monongahela)? It was also argued that the ordinance was merely a scheme to force bridge companies to sell and also a device of some politicians to court votes. . . . Passage of ordinance lost when put to vote, but passage to be reconsidered."

An ordinance requiring the City of Pittsburgh to erect a bridge--which was, however, a compromise document--was finally pushed through as reported in the Daily Post of 22 October, 1874. "At a meeting of the bridge committee held yesterday afternoon, the City Attorney was directed to prepare an ordinance empowering a private company to erect a bridge at the Point and collect toll for fifty years, at the expiration of which time the City will take possession at a price not exceeding the original cost." Accordingly, there would appear at the Point a structure destined to be unique in America--a rigid suspension bridge.

The Point Bridge Company was formed and a charter was obtained from the State dated 26 December, 1874.¹⁸ The directors were R. F. Smythe, H. Darlington, A. E. Painter, Jacob Henrici, Robert Marshall and Robert Stevenson and the officers were Joshua Rhodes, president; R. W. McConnell, secretary; George Crook, treasurer; Charles Davis, consulting engineer; P. F. Brendlinger, resident engineer.

The survey for the bridge was begun in 1875.¹⁹ The Engineering News account in its issue of 14 April, 1877, of the erection of the bridge, taken from the Pittsburgh Leader of 1 April, 1877, is undoubtedly the best and fullest extant chronicle of the undertaking, so we cannot do better than quote it extensively.

The Company did try to take into account the factors applying to navigational interests on the Monongahela, and thus the Engineering News' account begins - - - "The difficulties encountered in the beginning of the undertaking can hardly be understood or appreciated by parties not directly connected with the work. The navigation interest exercised almost absolute control over the river, and was not to be conciliated by any measure short of one granting it an uninterrupted channel of the natural breadth of the river and with head room to admit of the largest sized boats passing under the bridge at an ordinary boating stage, for manoeuvring their coal fleets. With such unreasonable conditions, and with the unfavorable topography of the banks in front of the city, it was no easy problem to make a design that would not obstruct the river, and at the same time give easy grades for the approaches to the bridge. The short level on the Pittsburgh side being only 27 feet above low water, while on the south side the banks comes abrupt against the water line, with a railroad cutting its face and at an elevation of 70 feet above the river bed. The consulting engineer prepared no less than four plans to endeavor to harmonize the different conflicting interests and at the same time to get a practicable and economical construction. The president and consulting engineer of this company was before the coal exchange on several different occasions on this business; and only after several protracted interviews were they enabled to reach an agreement on the present plan. All these conflicting elements had to be harmonized in carrying out the design of and construction of the bridge.

"Under ordinary circumstances bridging the Monongahela would have been of trivial importance."

The plan adopted would have necessitated an artificial approach on the north side of a depth of some fifty feet at the abutment and some six feet deep at the foot. The approach is about 1,000 feet long, and extends along the wharf outside of Water Street to Penn Avenue, and along Penn Avenue to Point Alley, giving an easy ascent to the bridge. An approach connecting the two bridges will be formed by filling up the Point. The plans for the work were approved in May, 1875.

The Point Bridge Company invited bids for building the bridge in May of 1875, with the understanding that they might be for cable suspension, according to specifications and plans prepared by their consulting engineer, which called for an 800 foot middle span and two independent side spans of 145 feet each or for any other plan. Proposals were made by most of our most prominent bridge builders of the country, among whom were Roebling Sons and the Keystone Bridge Company of this city, based upon various plans, viz: Cable suspension, braced arch, Ordish system, cantilever, unstiffened and stiffened chain suspension. In selecting the proper plan the directors and engineer of the Point Bridge Company were well aware that their bridge was of unusual dimensions and they took care not to adopt an experimental plan. The only long span bridges in the world to compare with the requirements of the point bridge were the Niagara railroad bridge and the Cincinnati bridge, both being wire-cable suspension, built by Mr. John Roebling, with 820 foot and 1057 foot spans respectively, and the chain suspension bridges-- one, the Clifton bridge over the Avon, in England, 702 feet long, and the

one across the Danube at Pesth, Austria, which has a span of 666 feet--all other long span bridges being either of less length or are only built for light traffic. The plan finally adopted was a stiffened chain suspension bridge, submitted by the American Bridge Company of Chicago,²⁰ and designed by their chief-engineer, Mr. Edward Hemberle.²¹ This plan represents all the good features of a modern chain suspension bridge and has, in addition, a novel stiffening system, which, as far as theoretical investigations and judgment can determine, seems to obviate all the faults of wire-cables and of the formerly built chain suspension bridges.

In ordinary suspension bridges the roadway is suspended by hanging rods from chains or cables which stretch from pier to pier. In such a structure the chains or cables and the platform are flexible longitudinally, and this is shown whenever the bridge is loaded at one end more than at the other by a moving load, or is subjected to wind pressure from above or below. To improve the suspension bridges in this respect has been the aim of many engineers. The simplest improvement has been effected by keeping the points of the curved chain or cable which are more liable to deformation in their proper places by attaching them to the top of the towers by straight chains or wire-rope stays, which plan was first adopted by Ordish in Europe and by Roebling in this country.

A method for rendering the chain itself rigid has been attempted by dividing it into two parts, placed one above the other and bracing them together. A railway bridge upon this system, with a span of 260 feet, is in actual use in Vienna, in Austria, but would not be efficient for a long span. A system according to which a single chain is connected to the platform of the roadway by bracing was adopted in the construction of Lambeth bridge across the Thames in London, having spans of 180 feet, built in the year 1862, and in a footway bridge over the Main at Frankfort, Germany, of 262 feet span in 1869. This system properly improved may fulfill all the requirements to ensure stiffness; but in long spans the bracing between roadway and chains will have to be of such great length as to make it ineffective and expensive.

Mr. Hemberle's plan, as represented by Point bridge, consists of towers, chains with platform suspended there-from in the same manner as in a regular chain suspension bridge; In addition thereto is a stiffening system above the chains, and are rigid posts arranged between chain and platform to prevent the roadway to undulate or oscillate independent of the structure above. The stiffening arrangements above the chains consist in rigid chords running in straight line from the top of the towers toward the center of the chain, and being connected thereto by a hinged joint at each end. Between these chords and the chains is a system of bracing, consisting of posts and diagonal tie-rods. All connections are pin-jointed. The chain, being a catenary or curve of equilibrium, takes up all the permanent load of the structure, without bringing strains on the stiffening trusses. This object was accomplished by erecting the bridge completely before connecting the ends of the straight top chords to the center joint. The rods are provided with turn-buckles, and are so adjusted as to be strained under moving load only.

When the bridge is half-loaded the top chords of the trusses on the loaded side will be in compression and the unloaded side in tension. There are lateral and vibration braces between the top chords and also between the chains, proportioned to take up the strains from win-pressure upon the strains and trusses.

A model of Point bridge was exhibited at Philadelphia and received an award, and Mr. Hemberle was the recipient of quite a number of complimentary letters from most prominent American and foreign engineers approving his new plan.²²

The total length of the Point bridge is 1,245 feet from back to back of the anchorages, with one middle span 800 feet between center of piers, and one independent-trussed side span of 145 feet in length at each shore. The roadway rises from both shores toward the center of the channel with grades not exceeding 3 feet in 100--the highest point of the roadway being 83 feet above low water. The saddles upon which the chains rest on top of the towers are 180 feet above low water. The deflection of the chain is 83 feet, which is considerably more than usual for suspension bridges, but the stiffening allows of increasing the deflection and thereby reduces the strains in the chains and their weight. The bridge is 34 feet wide from center to center of outside rails and the space is divided into a roadway 21 feet wide and two sidewalks of 6 feet each by inside iron handrails. The piers up to the roadway and the anchorages are built of masonry. They are founded upon timber platforms sunk to a gravel bed below low water. The masonry is of the best quality--Baden sandstone laid in cement mortar.

The towers are entirely of wrought-iron except the bases of the columns. Four columns each 30 inches square braced together by lattice work form the support for each chain, which carried at the top of the towers on wrought-iron saddles, which are movable on steel rollers to allow for expansion and the elongation of the back chains under strain or from changing temperature.

The chains are formed of link bars, 20 ft. 6 in. long, varying in size from 8 by 2 inches to 8 by 1 inch, connected by pin bolts 6 inches in diameter. There are 12 and 13 bars alternately in the back chains, and 11 and 14 bars in the main chains. Stiffening trusses on top of the chains are 22 feet high in the middle and their upper chord is box-shaped with full rivet splices to resist tension as well as compression.

Outside of the floor are roadway trusses 8 feet high, part above and part below the floor. They are built continuous in lengths of 100 feet, and are jointed together at their in-ends in such a manner as to allow for expansion and contraction of the iron work. These trusses are suspended from the chains by iron rods placed in pairs every 20 feet and by rigid posts every 100 feet. Iron cross girders, 3 feet in depth, connect these roadway trusses every 20 feet and support two intermediate lines of iron stringers. These stringers and the roadway trusses form the bearers across which are placed the wooden joists for the flooring.

The roadway consists of two courses of 2 -inch oak planks, the lower course being laid diagonal and the upper lengthwise to the bridge. Two street-car tracks are laid upon the floor. The side-walks are laid with narrow 3-inch plank of southern pine. The lateral stiffness of the floor is secured by a double system of tie-rods and the wind pressure is taken up by four horizontal steel wire cables, placed under and connected to the floor.

The specifications for the Point bridge call for a moving load of 1,600 lbs. per lineal foot, to be carried by the structure in addition to its own weight, with a factor of safety of 5, that is, it would require five times the above load to break the bridge down. The 1,900 lbs. per lineal foot is for the 800-foot span, equal to 1,280,000 lbs. which weight is equal to 16 locomotives or equal to the weight of a crowd of 9,000 good-sized people. Such a load is very unlikely every to come on the middle span of the bridge, and five times that load would not injure the iron works. The back chains on each of the bridge have a sectional area of 384 square inches, and were all put to actual test of 10 tons per square inch without showing any injury, which will make their reliable supporting power equal to 3,840 tons. For the floor system and the suspenders the proof load is taken at 896 tons for the middle span.

There are 156 suspension-rods carrying the floor, each with a strength of 47 tons, as proved by actual tests which will make their supporting power equal to 7,132 tons, which is equal to the weight of 180 locomotives.

Each of the towers has a sectional area in columns of 504 square inches, and their resistance against failure under the load would be equal to 10,080 tons, whereas the load which ever may come on is only 1,800 tons.

The lateral cables under the floor are at each side, double 2 -inch cast-steel wire ropes, each having an ultimate strength of 210 tons. They would resist the greatest strains brought sideways against the bridge in case of a hurricane, and the bridge has already, under severe winds, proved to be absolutely rigid sideways.

The total cost of the bridge is about \$525,000, which is very low compared with other structures of the same magnitude; Cincinnati bridge, being only 200 feet longer, cost \$1,800,000. The chain suspension bridge at Pesth, Austria, having a middle span of 666 feet only, cost \$2,700,000. St. Louis railway bridge, having spans of 520 feet, cost seven millions.

The president and directors of the Point bridge company deserve great credit for the manner in which they conducted this enterprise. It is due to their efforts and management that this bridge was finished in such short time and at so small cost compared with other bridges in this and other countries.

The American Bridge Company of Chicago, H. A. Rust, president, presented not only the best plan, but also were among the lowest bidders, and the contract was awarded to them for the whole structure complete. The American Bridge Company transferred the contract for the masonry and the foundations to John Megraw, of Allegheny, who has done his share of the work in the most

satisfactory manner, and is right in claiming to have the best job of mason work done along our rivers. The award of the contract to an outside company created quite a feeling amongst the Pittsburgers, who are right in claiming their superiority in manufacturing of iron-work, and it may be quite a satisfaction to them that after all most of the work has been done here, with the exception of the forged linkbars in the anchorages and parts of the iron-work, for the manufacture of which the American Bridge Company have special tools in Chicago, all the iron-work was manufactured by Pittsburg parties. Graff, Bennett & Co., furnished the iron in quality unrivaled for the purpose. It is superior in strength and other qualities required for bridge iron to the manufacture of parties making bridge iron their speciality. Mr. Williams, the superintendent of their mill, deserves a great deal of credit for his efforts in obtaining for the unusual large bars a quality of the iron in strict conformity with the specifications.

The manufacture of the iron-work was done at the Pittsburgh Locomotive-Works, under the supervision of the American Bridge Company's agents. The manufacture of the large link-bars was, after some experimenting, brought to perfection, so as to insure the same strength throughout the entire bar and eyes, which before has been only obtained by the process of Mr. Sellers at Edgemoor.

On July 1, 1875, work was commenced, and by the following winter the masonry was well advanced. Early in the spring operations were again resumed and continued without interruption to the present date. A great deal of the most difficult work, such as the stiffening-truss, was prosecuted in mid-winter, with the thermometer ranging near zero, and with heavy winds prevailing. Much of the time the material was covered with snow and ice. The rough weather severely taxed the endurance of the men, but in no instance did it get the mastery. Much credit is due Mr. George C. Thorn, superintendent of erection, for the masterly manner in which he conducted the work through such adverse circumstances, and without the occurrence of any accident.

The specifications were drawn with considerable minuteness and required very rigid tests for iron. The links were to be made of the best quality of double refined iron, and in addition to other tests were submitted to a proof strain of ten tons per square inch, sectional area, before they were admitted into the chains. This testing, as well as the inspection of the work, and the giving of levels and distances connected with the bridge, in compliance with the specifications, was intrusted to the resident engineer, who was also the estimating engineer.

The records of the iron test have been carefully preserved, and form a valuable record.

The quantities of the material used in the construction of the bridge are as follows, viz:

Timber in foundations, 1,442,000 feet, board measure.

Masonry in anchor-walls, 1,868 cubic yards.

Masonry in piers, 7,507 cubic yards.

Iron in foundations, 12 tons.

Wrought-iron in superstructure, 2,084 tons.

Cast iron in superstructure, 52 tons

Steel in superstructure, 32 tons

Timber in superstructure, 810,000 feet, board measure.

Number of links in the chain, 1,832.

As an immediate result of the building of the bridge we should note the approaching completion of the Duquesne Inclined Plane designed to overcome the gradient of Coalhill, and so situated as to connect with the Point bridge. And yet another, in the proposed street car railway, starting from Fifth Avenue and Liberty Street then along either Penn or Duquesne Way to the bridge, across the bridge to Carson Street, along the same to Saw-mill Run and continued to the Old Stone tavern.

The Point Bridge Company are already engaged in constructing a portion of this line connected with the bridge and approaches on their own account.

Also another improvement, diverting travel through new channels, in the shape of a proposed freight and passenger depot for the Panhandle R.R., at the terminus of the bridge.

It is impossible to calculate the benefits to be derived by the different portions of the city in the increased facilities for intercourse afforded by the erection of this bridge. It will undoubtedly restore the old part of Pittsburgh about the Point to its former vitality, and will greatly contribute to the speedy development of heretofore almost inaccessible territory on the South Side. By such schemes of internal improvement at this, the thrift and general prosperity of the city is enhanced, and additional comforts to the citizens secured.

And we have no doubt that the parties interested in the construction of the bridge will be amply repaid in this investment.

The bridge will not be open for general traffic before ten days, the approaches not being finished yet. The bridge itself is completed, except the finishing of the hand-rails and the ornamental work of the towers. The ornamental work of the towers will be done quite elaborately and it will greatly add to the beauty of the structure. It is to be of galvanized iron, and the work, already done by Messrs. Stevenson & Cartwright, of Allegheny, awaits only good weather to be put in place. Two more coats of paint are to be put on the bridge as soon as continuous good weather can be expected.

The bridge was opened in April 1877. The light construction of this bridge was, however, in the end a drawback because the company did not maintain it properly. It was hardly in safe condition when the City of Pittsburgh acquired it in 1896, as the result of an ordinance introduced

into City Councils in 1895. A Board of Viewers considered \$420,000 as a fair price for the span, but the City acquired it for \$400,000.²³ The clamor for "free" bridges in Pittsburgh had by now become insistent and the Point Bridge was the first local span to be municipally acquired as the South Twenty-Second Street Bridge of 1895-96 was the first to be constructed by the City.

A thorough inspection of the Point Bridge was undertaken in 1897 by John Brunner for E. M. Bigelow,²⁴ the Director of Public Works of the City of Pittsburgh, but no appropriation could be obtained for executing repairs. In 1901 Brunner's plans were revised by Willis Whited, assistant engineer of the Department of Public Works, but no action was taken until December 1903 when it was discovered that three floor beams were broken and the bridge was then closed to heavy traffic and a \$92,000 contract was made with the Pittsburgh Construction Company for complete repairs.²⁵

Reconstruction work was begun 1 June, 1904, and completed 28 November, 1904. The anchor piers were taken down and rebuilt and all cables were examined and strengthened. Stay bolts and anchor bolts were renewed so as to tighten the entire structure and whole bridge was painted and re-floored. Ornamental sheet metal domes were substituted for the former light grill work at the top of the suspension towers. Strengthened though it was, the engineers conceded that the bridge was still fragile and would eventually have to be replaced.²⁶

Even so, for many years the delicate web of the first Point Bridge rose above the confluence of the rivers, its large suspension towers like cathedral turrets soaring against Pittsburgh's sulphurous skies. The writer, as a small child, remembers motoring across it on a foggy morning in 1915 and the passage was like a dream as we proceeded in the old high-slung motor car through the truss and cables as through notes and bars of music. The great bridge was essentially a sonata, a poem, the music and poetry of the engineers, flung into the air by some calculated and yet incalculable sorcery and it achieved an effect perhaps never envisioned by its "practical" designers long vanished now; long vanished too, it lingers in the memory as something strong and beautiful and good, an ambassador of grace to the manufacturing principalities of nineteenth century Pittsburgh.

But, alas, all its poetry could not save it (the same could be said for many other engineering triumphs of the nineteenth century) and by the early 1920's it was more than evident that its days were numbered. In 1924 the bridge was closed to heavy traffic and in January of that year a mass meeting was held by the citizens of the West End, a large suburban area on the south bank of the Monongahela, to advocate prompt action by Allegheny County in building a new bridge.²⁷

The Point Bridge II: 1927

As a result of such public agitation the County Department of Public Works began to study the situation and in due course the County Engineers, V. R. Covell, C. M. Reppert, and their associates completed a number of general designs for the bridge on the span lengths and clearances which the government has approved.²⁸ A committee of engineers then made a study of the several plans. Meanwhile funds for the new bridge were provided-- a sum of \$2,325,000--in an Allegheny County people's bond issue and a discussion continued among City and County officials as to which plan should be adopted. A bridge at right-angles to the old bridge was considered but was rejected because approaches at either side would be too difficult.²⁹

Finally plans for a bridge that would run parallel to the old bridge were approved by the County Commissioners. To avoid obstructions in the river channel a through-cantilever type of construction was adopted. The total length of the bridge was to be 1330 feet with approaches. The main span clearance for river traffic was 430 feet and the span supported as well a 38 foot roadway, allowing four lanes of traffic and two 12 foot sidewalks.³⁰

A preliminary perspective sketch for the new bridge was published in the local architectural magazine, The Charette V:6 (June, 1925), frontispiece, and in the same magazine another sketch of the final design with a brief article appeared, V:10 (October, 1925), frontispiece. The design also carried the approval of the Pittsburgh Art Commission, who had recommended that the cantilever, in which both the top and bottom chords curve downward, should be given a convex outline to harmonize with the nearby Manchester Bridge.³¹ The architect for the bridge was Standley L. Roush.³²

Work on the new bridge began in April, 1925, when Sprague and Henwood, core-drilling contractors started test borings to determine what foundation conditions would be encountered in the sinking of the two main piers.³³ In June, 1925 the contract for the piers and the approaches was awarded to the Dravo Construction Company of Pittsburgh for \$591,195.³⁴ In December of the same year the contract for the steel superstructure was awarded to the Fort Pitt Bridge Works of Pittsburgh for \$907,685.³⁵ The engineer in charge of design for the Department of Public Works was George S. Richardson.³⁶ Final working drawings for the bridge were completed in September, 1925.

On 21 July, 1925, the Pittsburgh Gazette-Times reported that "the first caisson for one of the two river piers of the new Point Bridge was towed up the Ohio River from the Neville Island plant of the Dravo Construction Company to the bridge site. It will be filled with concrete and sunk in the river bed at the pier site, enabling workmen to construct the pier below water line. The laying of the substructure is to be completed by 1 June, 1926 and erection of the superstructure will start later."

In November it was reported that "the masonry of the new Point Bridge has just been completed by the Dravo Construction Company of Pittsburgh at a cost of about \$657,000. Steel erection has been going on since early summer beginning on the north side where the masonry was first completed, and at the present time most of the steel work is in place. Fort Pitt Bridge Works is fabricating and erecting the superstructure. Present expectations are that the steel work will be finished in January 1927 and that the bridge will be open early next year."³⁷

The construction of the superstructure was something of an engineering hybrid, that is, a cantilever arch-truss, with a suspended central span. The three primary elements comprising this type of construction are an anchor arm, cantilever arm and suspended span. The bridge is anchored in tension to the shore abutments and pivots about the river piers. The central span is hung from the arch construction which cantilevers out from each pier. The portals compared with the ornamental delicacies of those of the nearby Manchester Bridge were stark and brutal, being composed of unadorned steel plates, but nonetheless impressive. Technology was totally triumphed, having cast off all historical masks. The day of the adorned bridge portal has vanished.

On 20 June, 1927, the new bridge was opened to traffic in a ceremony in which some 2500 persons took part. The completed span was turned over to the people of Allegheny County by the Commissioners who accepted it from Norman F. Brown, the Director of Public Works.³⁸

For a time the new bridge was sufficient for all traffic needs at the Point, but after 1945 with the development of the new Point Park scheme and the increasing motor traffic to the South Hills beyond the Monongahela, it became apparent that the days of the cantilever span were numbered and it too was closed in June 1959. Truly, the days of a modern highway bridge are as grass, but the last years and death of the Point Bridge are so intimately connected with those of its fellow Point span--the Manchester Bridge--that the two will be discussed together later.

The Union Bridge

Meanwhile, we must return to the Union Bridge, the first of all the Point spans, that with its stolid wooden trusses and its ornamental Italianate portals was still doing duty at the turn of the century, albeit it also needed repairs after 25 years' service.

Unfortunately, from the very beginning there had been complaints about the bridge on the score of obstructing navigation on the Allegheny River. At low water the clearance height of the span was 37 to 40 feet, but at high water only 7 to 9 feet.³⁹ In 1902 the dissatisfaction became so acute that a petition was sent to the Secretary of War by persons, corporations, and companies in and about Pittsburgh--"There can be no doubt that this bridge is an unreasonable obstruction to the free navigation of the Ohio, Allegheny, and Monongahela Rivers on account of insufficient height . . . We respectfully request that you will investigate this matter, having full confidence that after making such an investigation you will find it to be your duty to take action against its owners under provisions of

Section 18 of the River and Harbor Act approved 3 March, 1899. The Union Bridge is an old wooden structure and will soon need, in fact it already needs extensive repairs to make it safe for public use."⁴⁰

The matter was referred by the Secretary of War to the proper officers of the Engineering Corps of the Army for examination and report. Under the date of 8 December, 1902, Captain Sibert, Captain of Engineers, who conducted the examination reported and recommended to the Chief of Engineers that the company be given notice to make alterations. On 16 December, 1902, the Chief of Engineers transmitted that report to the Secretary of War.

On 20 January, 1903, Mr. Root, then Secretary of War, issued notice to the company to alter the bridge, giving them 18 months in which to comply.

At the request of the company the time was extended by successor Secretary Taft to 1 December, 1904, and again extended by him to 1 January, 1905. Subsequently, a rehearing was requested by the company but was refused by Secretary Taft, who in his reply said that at the time the bridge was erected, the Army engineer in charge of the district, Colonel Merrill, publicly announced that the bridge was an obstruction to navigation.

Finally, the last court of appeal, the Supreme Court, ruled that the company must comply with the government order. Rather than alter the aging structure, the company decided to close and dismantle it. The date for the beginning of demolition on file at the Department of Public Works in Pittsburgh is 4 May, 1907. The Pittsburgh Chronicle-Telegraph for 31 May, 1907, goes on to say that "The Dravo Construction Company has the contract for dismantling the bridge . . . The bridge charter is now on the market (there is no record in the charter books at Harrisburg that it was ever sold). One million feet of timber are being removed--principally white pine--and it is in remarkably good condition. Within the next thirty days all timber will be down and then the work of taking down the piers and abutments will begin. If a new bridge is built it must be 72 feet above low water mark and have a channel span of not less than 100 feet."

Thus passed the archaic wooden bridge at the Point; it was essentially an artifact of early nineteenth century America and could not have endured much longer in any event. In old photographs its rough spans betray a curious stilted awkwardness, and for all the provincial sophistication of its "architectural" portals, it still looked crude, homespun and egregiously out of fashion. A "rugged individualist" bridge, built in a free-wheeling age by rugged individualists who took no account of navigable streams, it vanished because it could not survive in the twentieth century. But as a document of medieval industrial America, its history is instructive.

Unfortunately, the passing of the Union Bridge left its important and strategic site bridgeless and an increasing volume of traffic was thrown upon the bridges farther up the Allegheny--the Sixth, Seventh, and Ninth Street bridges. Many former patrons of the bridge, especially baseball

"fans" who had used it to reach the Old Exposition Park on the North Side, watched its demolition with regret.⁴¹ Despite the need of a new bridge, the fact that toll bridges over the rivers were rapidly becoming a thing of the past, made it very unlikely that any bridge company would buy the charter of the old Union Bridge. A new bridge would have to be built either by the City of Pittsburgh or Allegheny County.

Even before the old bridge was demolished there was talk of a new bridge--"Many influential citizens of Pittsburgh and Allegheny are said to favor a bridge plan that was outlined by Director E. J. McIlvain, of the Department of Public Works of Allegheny...It is proposed to build an immense bridge to span the Allegheny River from a point near the Exposition Buildings (on the Pittsburgh side) to Coleman Street with an elevated approach spanning the Baltimore and Ohio tracks and yards, Rebecca, Lacock, Ann, Robinson, and Kilbuck Streets, the approach to extend to Coleman Street by Monument Hill."⁴²

The Manchester Bridge

A bridge on the same site, however, still seemed to be the most desirable because it would form a companion to the Point Bridge, and with proper integration of new with existing approaches at the Point, traffic moving between the North Side and the South Side could be handled with great ease. Also, with private bridge companies now obsolescent, it was conceded that the City would have to construct the new span. It would also have to be constructed of steel; not only was timber not a viable material for early twentieth century bridges, it had also become too expensive.⁴³

Accordingly, at the general election of 3 November, 1908, the question of increasing the City's indebtedness in the amount of one million dollars was approved. In the early part of 1909 sixty thousand dollars worth of bonds were sold to cover the cost of preparing preliminary plans and this work was immediately begun. A contract was advertised in June 1910, and bids were received during June and July of that year for building the three main piers.⁴⁴ Before the contract could be awarded, however, a decree from the Pennsylvania Supreme Court nullified the bond issue of 1908. For the moment this effectively stopped work but in the election of 6 November, 1910, another bond issue was approved and the work went forward once more.

The bridge was designed under the direction of the Department of Public Works of the City of Pittsburgh with Joseph G. Armstrong as Director, and N. S. Sprague, Superintendent of the Bureau of Engineering of the Department, as superintendent of the work, assisted by T. J. Wilkerson of the Division of Bridges. Booth & Flinn, Ltd., of Pittsburgh, were the general contractors for whom M. J. Feeny was general superintendent.⁴⁵ Emil Swensson was consulting engineer.⁴⁶

In March 1911, bids were again advertised for the three main piers of the "North Side Point Bridge" at an estimated cost of \$210,000. The lowest bid of \$182,750 was submitted by Dravo Contracting Company and the contract was awarded to them in April of the same year.⁴⁷ These piers constructed of concrete faced with Beaver sandstone were completed by October, 1912. They were supposed to have been completed by January of that year, but an accident occurred in construction of the river pier which delayed the work. The final cost of the substructure (the piers) was \$196,000.⁴⁸

During the summer of 1912 bids were advertised and received for the two steel truss spans of the superstructure. On 16 August, 1912, the contract was awarded to the American Bridge Company at \$297,792. Because of the delay on the substructure work could not be begun on the spans until 1 August 1912, and it was completed 5 November, 1913. The final cost for the two spans was \$300,000.⁴⁹

The superstructure consisted of two truss spans of the modified Baltimore type with subdivided panels, each 531 feet long, with a clearance of 70 feet above harbor pool level. The spans were heavy, being designed for a solid floor of buckle plates, concrete, and wood block paving. The roadway was 36 feet wide and flanked on each side by 12 foot sidewalks, making in all a 60 foot deck.⁵⁰

During the summer of 1911 plans were started for the approaches. During the latter part of that year an Art Commission was appointed to deal on an aesthetic basis with the public works of the City of Pittsburgh and henceforth all bridge plans had to be submitted for approval. Late in 1911, also, the Commission had introduced into City Councils, ordinances authorizing the advertisement and submission of competitive plans for the approaches, and this acted to stop the work that the Department had been doing on this part of the project. It was not until 29 April, 1913, that the Department could once more continue with its own plans.⁵¹

The work was advertised and the first bids were received on 15 July, 1913, but owing to the fact that all bids exceeded the amount of money available for the construction, they were rejected. The plans were then revised and bids were re-advertised. Bids on the revised plans were received on 3 November, 1913, and the contract was awarded 23 December, 1913, to Booth & Flinn, Ltd., of Pittsburgh. Construction was begun 9 January, 1914. Plans were then begun for paving the main spans and approaches and the contract was awarded 30 December, 1914. Work was begun on the paving early in 1915 and completed during the first half of that year.⁵²

The north approach consisted of a series of 6 reinforced concrete arches of varying spans and a long fill between concrete retaining walls--the total length of the approach being about 865 feet. The clear spans of the arches were 85 feet; 73 feet, 6 inches; 63 feet, 5 inches; 54 feet, 8 inches; 47 feet; 40 feet, 4 inches, the longest span being adjacent to the 531 foot river span. The arches rested on concrete pile foundations. The retaining wall construction had a length of about 442 feet and the entire approach was on a 4.9383 per cent grade.⁵³

The south approach at the Point had a total length of about 913 feet and consisted of two concrete arches with clear spans of 73 feet, 6 inches and 85 feet, together with 728 feet of retaining wall construction on about a 5 per cent grade. Since this approach joined the already existing ramp of the Point Bridge, the combination resulted in a Y, one arm of which branched to cross the Monongahela and the other the Allegheny, an echo, perhaps, of the old tri-partite bridge schemes of the nineteenth century.⁵⁴

Finally the Pittsburgh Chronicle-Telegraph reported on 9 August, 1915, that--"As a climax to almost 7 years effort, balked at several instances by legal procedure, the new \$1,000,000 Point Bridge leading from the Point district over the mouth of the Allegheny River was dedicated at 2 o'clock this afternoon, Mayor Joseph G. Armstrong christening the structure Manchester Bridge.⁵⁵ Speeches were made by the Mayor, John M. Goehring, President of City Council, and Attorney Charles W. Dahlinger.⁵⁶ The North Side, particularly the old Manchester section, was in gala attire for the occasion, the actual dedication ceremony taking place at the north end of the bridge."

Not only did the opening of an important bridge become an occasion of public rejoicing in the earlier years of this century--rejoicing with banners, processions, and speeches--but the portals of the bridge itself--the entrances and exits--were still accounted worthy of some architectural accentuation and commemoration. Our present day, which is not one of ceremonies and respects, will have none of this "superflous" adornment. A bridge is a bridge, its passage is not memorable, its gate is not glorious, nor is its terminus splendid. But responsible citizens in the teens of our century still felt that art should be called upon to bless the rigors of the new technology and ratify municipal pride. Art was accordingly called upon.

This was also the age of the City Beautiful, the last grand-flowering of the Renaissance-Baroque ideal of city planning. This ideal had no small part in the formation of Pittsburgh's Municipal Art Commission in 1911 and for the term of its existence it was to be dominated mostly by Classical ideas of Beauty and Order. As we have already seen, it took its duty very seriously in regard to the Manchester Bridge.

When the bridge was dedicated it was still naked of any ornamental adornment. As we have already seen, bridges at the "historic" Point were considered worthy of special recognition. The first Point Bridge, in itself a kind of early technological cathedral, possessed great quasi-Egyptian pylons as anchor piers, between which traffic moved. The homely wooden tunnel of the Union Bridge had vernacular Italianate wooden architectural screens at both portal--portals which imitated stone.

The Manchester Bridge had been originally designed to incorporate stone portals, but they were never constructed. Perhaps the best account of the bridge portals is contained in a magazine article of the time⁵⁷--"Highly

sculptured ornamental portals are to be added to the North Side Point Bridge, Pittsburgh, at a cost of about \$60,000. Stone archway portals were designed, but for various reasons, principally that of cost, they were abandoned. New plans are the result of a year's study by the Pittsburgh Department of Public Works in cooperation with the Municipal Art Commission. General plans were shaped mainly by Stanley L. Roush, architect, in collaboration with the sculptor selected for the work, Charles Keck, of New York City.⁵⁸

Several drawings and a photograph of a small scale model are reproduced here.⁵⁹ The steel portals to which the ornamental work will be fixed is already in place, being part of the original design. Although the bridge is of the regular curved-chord type with inclined end posts, a vertical portal was provided at each end with posts footing over the end pins; and the top lateral system was extended out to this portal in order to deliver the wind shear to it. This steel gate was to have formed the core of the ornamental stone portal and the designers held the view that by actually transferring the wind forces to the plane of the vertical portal, the stone portal would place true emphasis on a structurally vital element, namely that which secures the stability of the bridges.

"The stone portal would have concealed the steel portal, but the new cast iron, steel and bronze design utilizes the general outline and appearance of the steel portal with the addition of surface ornamentation. 'It was the idea', states the architect, 'to evolve an ornamental portal which would harmonize with the steel structure, all needed members to be shown, and the ornamental parts made subordinate to them.' In the evolution of the design, sketches of various possible portals were prepared by the Department and submitted to the Art Commission and the latter selected the design that promised the best result.

"More extensive drawings were then made and development of the main ornamental elements was elaborated in conference with the sculptor and a half-inch scale model was constructed. When the Art Commission passed on the model . . . construction contracts were let. A further process will be to prepare quarter-size models for final criticism and revision and then full-sized models for the foundry.

"The cost of the two portals will be \$45,000 and changes in the steel work of the portals about \$5,000 more."

The ornamental portals were finally affixed in 1917.⁶⁰ On the Pittsburgh side are shown kneeling on either side of the Arms of the City of Pittsburgh, Christopher Gist, the pioneer, and Gwaysuta, a local Indian chief. The Northside portal had a coal miner and a mill worker on either side of the same municipal escutcheon. On the upright of each portal were fixed ornamental lighting fixtures and flag staffs. The flag poles were removed some years ago, but the lighting fixtures and other cast iron ornaments are, since the demolition of the bridge in 1970, in the possession of the Pittsburgh History and Landmarks Foundation. The bronze reliefs are now in storage, later to be affixed to the north pier of the bridge which is to be retained for that purpose.⁶¹

The Fort Pitt and Fort Duquense Bridges

For a number of years the second Point Bridge and the Manchester Bridge continued to carry an ever increasing volume of traffic, but as the 1930's merged into the '40s, the sloping banks of the river that converged on the Point were transformed into elaborate modern highways. New and larger bridges would certainly be needed. But traffic was not the only reason why the old spans would have to go. The so-called Pittsburgh Renaissance with its large scale plans for the Point area was the prime mover in their vanishment.

A group of prominent Pittsburgh men, the Allegheny Conference on Community Development, established the Point Park Commission in 1945. In the same year the Pittsburgh Regional Planning Association, under the leadership of R. K. Mellon, authorized Charles M. Stotz and Ralph E. Griswold, to make a study of the lower triangle area that was to establish the essential features of the park. Their plans, refined through subsequent studies over intervening years in association with the firm of Clark and Rapuano, were incorporated in plans and specifications prepared for the General State Authority by Charles M. and Edward Stotz, in association with Griswold, Winters and Swain, landscape architects.

After the land was cleared of the tangle of commercial installations and decaying buildings, the park work was carried out between 1963 and 1968. Also planned was a great new highway that bisected the park, and to provide the necessary traffic interchanges, the bridges at the Point had to be removed and new ones built 900 feet upstream. The chief reason for this change was an aesthetic one, a "monumental" treatment of the Point itself which was to include a great fountain jet at the confluence of the rivers.⁶²

Once the new plans were determined, it was merely a matter of finding a time when the "old" bridges could be most expeditiously demolished. The new spans have no real part in this chronicle, but it will be necessary to mention them to the degree that they played a part in the last days of the Point and Manchester Bridges.

The Fort Pitt Bridge across the Monongahela was opened on 19 June, 1959, and accordingly the Point Bridge was closed on 21 June of the same year.⁶³ The Fort Duquesne Bridge over the Allegheny was completed not long afterward, but it could not be used for some years because it could not be connected with the ramps of the uncompleted highway system on the North Side. It was referred to locally as the "Bridge to Nowhere". Consequently the Manchester Bridge remained open until 1969. It is interesting that both these double-deck bridges were designed by George S. Richardson, of Richardson, Gordon and Associates, the engineer who had a prominent part in the design of the second Point Bridge.⁶⁴

Meanwhile the closed Point Bridge was exciting considerable controversy. In 1962, bids were opened for the demolition of the bridge. The Pittsburgh Post-Gazette of 28 March, stated that: "The County appraised that it will

cost \$391,589 . . . The County is in the position of being responsible for the demolition . . . because it still owned the bridge when the Fort Pitt Bridge and Tunnels were built, although it was stated to be turned over to the State eventually. On the other hand the State had already taken over the Manchester Bridge from the City when the Fort Duquesne Bridge was planned, so the State will finance the demolition of the Manchester Bridge." However, none of the bids were taken up and the demolition was left in abeyance.

Suggestions were made that the bridge be moved and relocated. The Emsworth Business Men's Association proposed that it be floated down the Ohio and relocated so that it could act as a river crossing between Neville Island and the Ohio River Boulevard.⁶⁵ Director Duff of the County Works Department said that the truss was too tall to be gotten under the Ohio River bridges.⁶⁶ Again, Robert Cummings, Jr., an independent engineer, proposed that it be floated up the Monongahela to a point near the Glenwood Bridge to be part of a proposed connecting link with the Parkway West.⁶⁷ This suggestion proved equally unfeasible.

Traffic congestion at certain times began to be a problem on the Fort Pitt Bridge not long after it was opened. The Pittsburgh Motor Club in 1964 tried to get the Point Bridge reopened.⁶⁸ But after much controversy the County Commissioners decided not to reopen the bridge, after traffic experts said that opening it might worsen rather than ease congestion at the Point.⁶⁹

Last minute attempts, as is usual in such cases, were made to "save" both bridges. New Uses were suggested,⁷⁰ but the truth was that the future of the Point had been decided 25 years before and the decision concerning the bridges was now irreversible. The Pittsburgh History and Landmarks Foundation, not long after its establishment in 1964, had already looked into the matter but deemed it useless to pursue it further.

To complicate the issue, the question of who was going to pay for the demolition of the Point Bridge--the County or the State--was bruited about for several years, but to tell the complete story would be tedious and unrewarding. The Pittsburgh Post-Gazette reported on 8 January, 1969, that the cost of razing the Point Bridge was now \$600,000, \$200,000 more than in 1962 when bids were first taken and rejected. The General State Authority, which funded the Park project, agreed to pay for the removal of the bridge ramps.⁷¹ Fred de Pasquale, assistant district engineer for the State Highway Department, said that the State would handle the demolition of the Point Bridge but that the County would have to pay for it. It was cheaper to demolish both bridges at once.

Finally an agreement was reached and the State awarded a demolition contract to the Dravo Corporation for \$2,600,000 on 31 October, 1969; the subcontract for the razing of the steel superstructures was given to the American Bridge Company on 8 December, 1969.⁷³ Thus two companies that had been participants in the birth of the two bridges were, in a sense, in at their death.

The Pittsburgh Press reported on 9 November, 1969, that--"Work on the long awaited one-year \$2,600,000 demolition of the Point and Manchester Bridges will get under way on 13 November with the North Side approach to go first to make way for Stadium roadways. Next to go will be the ramps on the Pittsburgh side to permit the final development of Point Park. The bridges themselves won't be demolished until May, 1970, because the U.S. Coast Guard restricts such work in winter."

Accordingly, the demolition of the Point Bridge was begun in the early summer of 1970. The dismantling of the great truss span was begun from the center by a large crane mounted on a barge and the removal followed a kind of reverse cantilever method.⁷³ George Richardson told the writer that in order to allow for such a method of demolition the suspended span of the cantilever arms had to be firmly pinned--thus making the whole structure a continuous truss for destruction's sake--otherwise the center span would have fallen bodily into the river. By the end of the summer nothing was left of the great bridge.

Then came the turn of the Manchester Bridge. After demolition crews had removed the deck, railings, and fittings from the south span, explosive charges were placed strategically among the trusses on 30 September, but when they were detonated the span still stood firm.⁷⁴ A second attempt was made 11 hours later and this time the span fell into the river from whence it was later removed by barges. On 28 October, the north span was razed by the same method.⁷⁵

So ended the story of the bridges at the Point. Should they have been preserved? This writer is inclined to think so. Certainly the Manchester Bridge could have provided a sorely needed pedestrian access to the new Three Rivers Stadium on the North Side. Now the spans have vanished, and the Point innocent of traffic encumbrances and still lacking its great fountain jet, thrusts its historic and immemorial length into the waters flowing always to the west.

The South Twenty-Second or Brady Street Bridge

The South Twenty-Second or Brady Street Bridge across the Monongahela River is included in this study because its impending demolition makes it imperative that some record be made of its history and construction. Also it is important to Pittsburgh because it was the second bridge owned by the City,⁷⁶ as well as the first toll-free river bridge in the area. As far as its construction is concerned, the steel superstructure, although it resembles the inverse cantilever construction of Point Bridge II, is in reality a continuous truss and thus unusual in its day.⁷⁷

The bridge is thus alternately known because it was built to connect the mouth of Brady Street on the Pittsburgh side with the South Side's South Twenty-Second Street.⁷⁸ The north bank of the Monongahela from the Triangle up the river for some distance consists of a relatively flat and very narrow "bench" overhung by steep hills and bluffs. About two miles from the Point, a narrow ravine--the valley once drained by Soho Run⁷⁹--bisects these hills tortuously. Here in the early nineteenth century a small suburban settlement known as Soho grew up, which as the city overtook it, became an area of heavy industry and workers' housing. Here two of Pittsburgh's important arterial streets, Fifth and Forbes moved close to each other, connected at the ravine by Brady Street.

The south bank of the Monongahela, which is quite narrow for a short distance above the Point, gradually widens out into a wide alluvial plain which probably reaches its greatest extent at South Twenty-Second Street. This area, which had formerly comprised the boroughs of Birmingham and East Birmingham, became part of the City of Pittsburgh in 1868. Like Soho, the South Side was heavily industrialized (common to both districts were the plants of the great Jones and Laughlin Steel Corporation) but it had much other commercial and mercantile activity, as well as a large middle-class residential population.⁸⁰

Until 1896 the whole South Side area was served by only one bridge--that erected at South Tenth Street--which was a covered timber span. It had, like other Pittsburgh bridges of the period, been constructed by a private company that charged tolls.⁸¹ The citizens of the South Side, since it had become part of the city, had been agitating not only for a new bridge farther up the river but also for toll-free bridges. The Brady Street Bridge was to meet both requirements.

Prior to the construction of the Brady Street span, a ferry owned by a Captain Harger, of Soho, had provided transportation between the north and south banks of the river. His ferry boat was called the "Josephine", and in 1896, still in good condition, it was moored below the new bridge. Captain Harger had owned the ferry franchise, which had to be purchased from him by the city before the bridge could be built.⁸²

The Engineering News reported on 1 February, 1894, that "Plans have been prepared for a free bridge at 22nd Street for the South Side. It is expected that the plans will be approved this week and the construction

commenced as soon as the necessary authority has been secured from the Congress." On 12 April, 1894, the same source declared that "The Director of Public Works will soon ask for bids on the South 22nd Street Bridge." On 19 April, 1894, "Both branches of Councils have voted to authorize an issue of \$1,500,000 of 30 years 4% bonds for erection of a free bridge." On 10 May, "The Council has ordered construction of the bridge." On 17 May, "The Director of Public Works is reported as stating that bids for construction . . . will be received as soon as the plans have been approved by the Secretary of War."⁸³

Again the News reported on 6 September, 1894, that--"The contract on the South 22nd Street Bridge will be awarded as soon as some minor details in the plans have been changed." On 15 November, 1894, "Bids are asked until 24 November for the erection of a steel bridge over the Monongahela River . . . E. M. Bigelow, Director of Public Works."⁸⁴ On 29 November, "The following bids have been received for the 22nd Street Bridge:

Pittsburgh Bridge Company, Pittsburgh	\$570,000
King Bridge Company, Cleveland.	\$485,000
Penn Bridge Company, Beaver Falls, Pa	\$454,000
Edgemoor Bridge Company, Edgemoor, Del.	\$576,000
Groton Bridge & Mfg. Company, Groton, N.Y.	\$435,000
Masillon Bridge Company, Masillon, Ohio	\$473,000
Schultz Bridge & Iron Company, Pittsburgh	\$399,750 ⁸⁵

The Schultz Bridge & Iron Company, who were the lowest bidders, were awarded the contract. The Pittsburgh Bulletin for 1 December, 1894, published a drawing with the caption--"Drawing of the new free bridge to be built over the Monongahela River at Soho by the Schultz Bridge and Iron Company, drawn by W. G. Walter."⁸⁶

One of the organizers of the Schultz Bridge and Iron Company was Albert Louis Schultz (1851-19?) who was president, general manager and chief engineer of the corporation until it was absorbed by the American Bridge Company. One source⁸⁷ credits Schultz with the design of the bridge, but it is difficult to give complete credence to this statement because there is no supporting documentation. Schultz was undoubtedly a competent bridge engineer who received his engineering education in Berlin. He returned to Pittsburgh after his graduation in 1874 and entered the employ of the Iron City Bridge Company as designer, until he formed his own company. Apparently the plans were prepared in the engineering division of the Department of Public Works before Schultz's company received the contract, but to what degree he may have been consulted either before or after the fact is at present obscure.⁸⁸

The Engineering News reported again on 27 June, 1895--"A correspondent writes us that the new 22nd Street Bridge will be the first of a series of free bridges. The Schultz Bridge Company has the contract for the entire structure and the Keystone Bridge Company will build the channel span. Drake, Stratton and Company have the contract for the foundations. The channel piers rest on a timber grillage 30 x 66 feet made up of 8 courses of 12 x 12 inch pine spiked together with square spikes . . . This was surmounted by a crib or box in which piers were built. The bottom of the river was dredged out to a depth of about 10 feet. The timber rests on gravel."⁸⁹

This work should have begun in December of 1894, but the severe winter weather made it necessary to delay operations until March, 1895, when ground was broken for the north abutment which was finished on 4 July. The masonry on the river piers was begun as soon as the river was free of ice, and it was completed on 15 August. The main span was constructed on floats moored on the river bank and the superstructure was swung into position on 24 November. The iron work was completed on 6 December. The ornamental work and paving were finished by 1 February, 1896.⁹⁰

The opening of the bridge on 25 March, was an occasion of great municipal rejoicing, particularly for the South Side. The Pittsburgh Chronicle-Telegraph reported on 27 February, 1896, that: "The people of the South Side are making great preparations for the opening of the free bridge on 25 March. A committee has formed to prepare a design for a medal which will be sold on the day of celebration." The same paper on 6 March reported that: "The dedication arrangements are practically completed." The Pittsburgh Press on Sunday morning, 22 March, 1896, ran a special section on the South Side and the coming opening of the bridge.

Among the advertisements for this section appears one for Bernardi's, a department or dry good store at 12th and Carson Streets; "All this week a beautiful souvenir free! With every purchase of goods, to the amount of one dollar or more, a souvenir will be given, a handsome plate with a picture of the new 22nd Street Bridge--something suitable to put on a mantel in any room"

It would be interesting to know if the souvenir medal was ever struck or if any of the souvenir plates have survived.

The Pittsburgh Press of 25 March, 1896, gave a very full account of the opening ceremonies and the procession that filed across the bridge and then down Carson Street: "Business was practically suspended on the South Side this morning by the different mercantile houses along the route of the inauguration ceremonies incidental to the opening of the new bridge. From daylight merchants spent hours decorating the buildings that lined the route of the parade. Carson Street from South 12th to South 22nd Streets was a mass of waving flags and tri-colored bunting which was draped in artistic festoons on the building fronts. Many businesses also had flags and banners stretched across the streets. In the throng, men were selling badges as well as books describing the bridge."

The Pittsburgh Chronicle-Telegraph of 25 March, 1896, described the bridge as follows: "The new bridge begins at a point on Forbes Street at Brady and follows the center line of Brady Street to Second Avenue, thence westwardly to a pier on the shore, thence across the Monongahela River in a direct line to Wharton Street, South Side, about 50 feet east of South Twenty-Second Street. The length of the bridge proper is 2,250 feet, the length, including the steel viaduct approaches is 2,530 feet." The north viaduct approach starting at the north abutment at Forbes Avenue is 837 feet long and the south 350 long; they are composed of plate girders and riveted lattice girder spans from 30 to 85 feet long upon steel columns. The channel span is a bow-string truss of 520 foot span. The flanking span at each end of the channel span is 260 feet long. These are modified Pratt trusses with riveted web members and eye-bars for the bottom chords.⁹¹

Tyrell in his History of Bridge Engineering gives a slightly different description of the superstructure--"The central 520 foot span consists of a pair of 3-hinged arch trusses of the Bonn type, 60 feet deep at the ends and 30 feet at the center with a lower chord rise of 44 feet. At each side of the center is a 260 foot span connected by false members with the larger span, the upper outline resembling somewhat the Northfield cantilevers. Trusses are 32 feet on center giving space for 2 lines of car tracks, a paved road of concrete on trough floor. The 8 foot walks at each side have asphalt over concrete and buckle plates."⁹²

White and von Bernewitz in the Bridges of Pittsburgh have given an erroneous description of the superstructure as "a through cantilever highway and street car bridge. Both top and bottom chords curve downward."⁹³ George Richardson told the writer that the engineer, Marcel Fertig, examined the bridge for the State in the 1960's and found that the channel span was a continuous truss.

Soon after the bridge was completed, cracks developed in the masonry of the piers and efforts to strengthen them and support them were without success. The upstream end of the north pier settled until the bridge had dropped 16 inches and was thrown out of line 11 inches. In 1909 a contract was awarded to the Dravo Contracting Company to rebuild the piers and a sub-contract was placed with the John Eichleay Company to raise the bridge, so that the old piers could be taken down and new piers constructed.⁹⁴

For many years the Brady Street Bridge gave good service, but in the 1960s the inevitable aging and the increase in traffic caught up with it. In 1963, trolley cars were forbidden to use the bridge because of movements in the floor system causing track displacement.

The Pennsylvania Department of Transportation acquired the bridge in 1962. In 1964, a consulting engineering firm submitted a location study for a new bridge. The bridge project was put on the Department's 6-year capital improvement program in 1967.⁹⁵

Because of deterioration the bridge was closed for repairs in September, 1968, the Conn Construction Company having been awarded a \$435,000 contract in April, 1968. The span was re-opened again in October, 1969. Meanwhile the concrete piers for the new bridge were being constructed on the down-river side of the old span.⁹⁶

However, at the moment of writing, the City of Pittsburgh is short of funds and does not want to pay for its share of a large interchange in Soho. Because of indecision on the part of City officials, work on the new bridge has been stopped for almost a year.⁹⁷ One official has said that perhaps a new Brady Street Bridge is not needed.

What is needed nowadays? The answer is far to seek. The giant concrete piers down-river seem merely to mock the motorist who now traverses the aging span, but if the motorist looks up he can take some comfort in the beauty of the old pride of the engineers. Whatever we need, one thing is certain: we have lost the assurance and the joy of those who celebrated on 25 March, 1896, the majesty and freedom of the bridge.

FOOTNOTES

1. J. N. Boucher, A Century and a Half of Pittsburgh (New York, 1908), II, p. 387. See also C. W. Dahlinger, Pittsburgh, Sketches of its Early Social Life (New York, 1916), pp. 29-30.
2. The route of Jones' Ferry appears on the McGowan map of Pittsburgh of 1852, together with other ferry routes plying the local rivers.
3. Richard S. Allen, Covered Bridges of the Middle Atlantic States (Brattleboro, Vermont, 1959), pp. 75-76.
4. Lewis Wernwag (1769-1843) was perhaps the most famous of all early American bridge engineers. Born in Germany, he came to the United States at the age of 17, settling in Philadelphia. He specialized in wooden truss bridges, his first famous work being a bridge of a single span constructed in 1812 over the Schuylkill at Philadelphia. See biographical notice in the Dictionary of American Biography, X, pt. 2, pp. 2-3.
5. Joseph White, and M. W. Von Bernewitz, The Bridges of Pittsburgh (Pittsburgh, 1928), p. 32.
6. D. B. Steinman, The Builder of the Bridge: The Story of John Roebling and His Son (New York, 1945), pp. 80-86.
7. This sandbar which was of sufficient extent that grain would be grown on it at low water, appears on the very early maps of Pittsburgh. Smokey and Kilbuck Islands, had like the sandbar, disappeared by the mid nineteenth century.
8. Newspapers of the early 1870's in Pittsburgh bear witness to the interest of the coal companies in the height of the Point Bridge span, and it was the non-compliance of the Union Bridge Company with the U. S. Government requirements that brought about the demolition of Pennsylvania Charter Books. Union Bridge Company. July 12, 1850.
9. State of Pennsylvania Charter Books. Union Bridge Company. July 12, 1850.
10. Erasmus Wilson, Standard History of Pittsburgh (Chicago, 1898), p. 117.
11. Engineering News, V (April 14, 1877), p. 90.
12. Davis (1837-1907) was one of those American engineers of the nineteenth century who seems to have learned his trade mostly "in the field", so to speak, particularly in railway surveying. Later he was consulting engineer for the Point Bridge and also designed a new structure for the Smithfield Street Bridge (to succeed

12. Roebing's aging suspension span), but Davis' design was discarded in favor of Gustav Lindenthal's bow-string truss structure of 1883-1886. Davis was elected Engineer of Allegheny County in 1881, a position he held until his death. See Biographical Reivew (Pittsburgh and vicinity), (Boston, 1897), XXLV, pp. 475-477 and Memoirs of Allegheny County, Pennsylvania (Madison, 1904), I, pp. pp. 37-38. There is also an obituary notice in the Pittsburgh Gazette-Times, February 22, 1907.
13. Engineering News, V (April 14, 1877), p. 90. This account makes no mention of a charter nor is there any mention of one in the State of Pennsylvania archives at Harrisburg, Pa.
14. Ibid, p. 90. See also the Supreme Court Reporter, 27 (October term, 1906), (St. Paul, 1907), p. 368.
15. Allen. Op. Cit., p. 76.
There are a number of exterior photographs of the bridge. White and Von Bernewitz has a photograph of the interior, p. 47. The Art Work of Pittsburgh has an excellent photo of the Point portal which was executed in the heavy Italianate style of the 1870's.
16. The Supreme Court Reporter, V. 27, (October term 1906), p. 368.
17. The Bridges of Pittsburgh (New York, 1970), p. 65.
This statement is probably due to a misreading of an inscription on a bronze tablet placed on the Manchester Bridge in 1932 commemorating "a rope walk" established on the hank of the Allegheny in 1812. The same writer (P. 65) also gives the date of the opening of the first Manchester Bridge, i.e. the Union Bridge, as 1820.
18. State of Pennsylvania Charter Books, Point Bridge Company, December 26, 1874. See also Engineering News Record, V (April 14, 1877), p. 90.
19. Pittsburgh Gazette-Times, Thursday, 21 July, 1921.
20. S. S. Schoff, The Glory of Chicago-Her Manufactories, (Chicago, 1873).
21. There is some biographical material on Edward Hemberle in Deutsch-Amerikanische Geschicht-sblatter (Erlevnisse und Beobachtungen eines deutschen Ingeneurs in den Vereincten Staaten), 1867-85, Vol. I, no. 3, pp. 22-25, no. 4, p. 1-12, vol II, 1, p. 15-24, no. 2, p. 10-19, no. 3, p. 21-31, no. 4, p. 12-21. Chicago V. 2, no, 1, p. 15 ff.
22. The Engineering News, III: 9 (February 26, 1876), p. 67 reproduced a perspective drawing of the proposed bridge, and the issue of

22. July 8, 1876 has two pages of drawings, part of which were reproduced here. Other contemporary descriptions of the bridge are to be found in the following:

"Point Bridge Pittsburgh", Scientific American Supplement, 2:34 (19 August, 1876), pp. 533-534; and "The New Bridge at Pittsburgh", 3 (May 5, 1877), p. 1107.

C. M. Garie1, "Le Pont Suspendu de Pittsburgh", Annales des Ponts et Chaussées (Memoires et Documents), 2 (1879), pp. 323-333. J. Seefeelner, "Long-Span Stiffened Suspension Bridge over the Monongahela River at Pittsburg" Institution of Civil Engineers, London-Proceedings, 58 (1879), p. 369.

Later descriptions are to be found in A. A. Jakkula, History of Suspension Bridges (Texas A and M. Engineering Experiment Station Bulletin 57, 1941), pp. 194-195. Henry Grattan Tyrell, History of Bridges Engineering (Chicago, 1911), p. 235.

Carl Condit, American Building Art: 19th century, (New York, 1960), p. 318. Although the author concedes that the bridge was unique in America, he takes an unfavorable view of both its construction and its architectural adornments.

G. A. Hool, and W. S. Kinne (comps), Movable and Long Span Steel Bridges, (New York, 1923), p. 325. Department of Public Works, (Pittsburgh, Company 1916), p. 36.

"Pittsburgh Bridges. . ." Pittsburgh Post, December 3, 1905. In this article the well known architect, Henry Hornbostel (1867-1961) who was famous for his architectural adornments for several New York bridges, including the Hell Gate Bridge, considered that the first Point Bridge was the finest in Pittsburgh from the standpoint of design and visual effect.

23. "The City's Bridges:", Construction, I:12 (March 25, 1905), pp. 22-23.
24. Edward Manning Bigelow (1850-1916) was the man, who more than any other, changed the physical aspect of Pittsburgh at the turn of the century and began its transformation into a modern city. His concern with bridges, street and highway systems, and the park system is still evident despite much recent re-planning. The first of the City's great traffic boulevards bears his names. At the time of his retirement, a notice in Construction III: 19 (March 19, 1906), p. 299, said of him--"With the passing of the present month... the city of Pittsburgh will lose one of its oldest one of its most faithful, and one of its most efficient public servants. Except for three brief periods, one of which was spent in the completion of his college course, he has been connected with the engineering department of the City for thirty-eight years.

24. Mr. Sigelow is pre-eminently a municipal engineer as distinguished from the civil, structural, or mechanical engineer—and as such he is typical of the class of men developed along engineering lines by municipal needs and conditions." He became City Engineer in 1880 and Director of Public Works in 1888. See the Book of Prominent Pennsylvania (Pittsburgh, 1913), p. 18, and obituary notice in Pittsburgh Gazette-Times, December 7, 1916.
25. "Reconstruction of the Point Bridge" (I), Engineering Record, 51:18 (May 6, 1905), p. 517-519.
26. "Reconstruction of the Point Bridge" (II), Engineering Record, 51:19 (May 13, 1905), pp. 540-543. See also Pittsburgh Leader, December 1, 1904.
27. Pittsburgh Post, February 1, 1924.
28. Pittsburgh Sun, April 8, 1925.
29. Pittsburgh Gazette-Times, November 4, 1924.
30. Pittsburgh News-Record, 97:20 (November 11, 1926), p. 804.
31. Roush (1885-1946) at that time County architect, is chiefly remembered for his alterations (1926) to H. H. Richardson's Allegheny County Court House and Jail at Pittsburgh and his County Office Building (1929-1931).
33. Pittsburgh Sun, April 8, 1925.
34. Engineering News-Record, 94:24 (June 11, 1925), p. 337.
35. Engineering News-Record, 95:23 (December 3, 1925) p. 313.
36. Richardson George S. (1896-), a noted bridge engineer, now senior partner in the Pittsburgh firm of Richardson, Gordon and Associates, who designed the Fort Pitt and Fort Duquesne Bridges at the Point, was associated with the Allegheny County Department of Public Works from 1924 to 1927.
37. Engineering News-Record, 97:20 (November 11, 1926), p. 804.
38. Greater Pittsburgh, June 25, 1927, p. 28.
39. Article by William Rimmel in Pittsburgh Post Gazette, 29 February, 1964.
40. This statement and those following which have to do with the litigation in connection with the bridge are taken, except where otherwise noted, from The Supreme Court Reporter, 27 (October term, 1906) (St. Paul, 1907), p. 367-381, Union Bridge Company vs.

40. U.S. See also United States Reporter, 204, U.S. 364, (October term, 1906), pp. 364-402. Union Bridge Company vs. U.S.
41. Pittsburgh Post, July 7, 1907. In 1909, however, the ball park and the Pittsburgh Pirates moved to the new Forbes Field in the Oakland district of Pittsburgh. Now in 1970, both are back at the Three Rivers Stadium, which is on the site of Exposition Park.
42. "A New Bridge Project," Construction, III; 12 (March 24, 1906), p. 275.
43. Pittsburgh Post, July 7, 1907. "Today a structure built of white pine (the material of the old Union Bridge) would cost more than one of steel because of the scarcity of lumber--a comment on the waste of our natural resources and the need for reforestation." It is good to be reminded that conservation had become a matter of great concern even in the first decade of this county.
44. Engineering News 63:23 (June 9, 1910), p. 247; 63:26 (June 30, 1910) p. 281; and 64:1 (July 7, 1910), p. 3.
Pittsburgh Chronicle-Telegraph, August 9, 1915.
See also Engineering News, 63:10, suppl., (March 10, 1910), p. 91. "Plans have been completed for a two span bridge to be constructed over the Allegheny at Water Street and South Avenue. . . Estimated cost \$1,000,000."
45. Engineering News, 72:23 (December 3, 1914), pp. 1124-26 and Engineering and Contracting, 41 (March 25, 1914), pp. 360-361. See also the bronze tablet affixed to the balustrade of the Pittsburgh abutment of the bridge some time after the dedication in August, 1915. This tablet is now in possession of the Pittsburgh History and Landmarks Foundation.
46. Emil C. P. Swensson (1858-1919) was a well know bridge engineer in the Pittsburgh area. Born in Alborg, Denmark, he was educated in Sweden where he graduated in 1879 from the Chalmers Polytechnic Institute of Gothenburg. He emigrated to the United States in 1881 and entered the service of the Phoenix Bridge Company of Phoenixville, Pa., where he became an expert in bridge engineering. In 1887 he moved to Pittsburgh and took a position with the Keystone Bridge Company, which in 1892 became a department of the Carnegie Steel Company. In 1895 he became superintendent and in 1896 chief engineer of that department. In June, 1900, the American Bridge Company bought Keystone and he became manager of the Pittsburgh plant, but he shortly resigned to open his own office as consulting and structural engineer. See Story of Pittsburgh and Vicinity (Pittsburgh, 1908), p. 101-102. Information also obtained from S. J. Swensson, the engineer's son, resident (1970) in Pittsburgh.

47. Engineering News, 65:10 suppl., (March 1911), p. 110; 65: 12 (March 23, 1911), p. 123; and 65:14 (April 4, 1911), p. 158.
48. Engineering News, 68:16 (October 17, 1912), p. 706-710. Engineering and Contracting, XLI: 24 (June 17, 1914), p. 684-686 contains a complete description of the design features of the sub-structure with plates.
49. Engineering News, 68:16 (October, 17, 1912), p. 706-710 and Pittsburgh Chronicle-Telegraph, August 9, 1915.
50. Engineering News, 68:16 (October 17, 1912), p. 706-710. Also Engineering and Contracting, XLI: 12 (March 25, 1912), p. 358-361 contains a complete engineering description, with plates, of the steel spans.
51. Pittsburgh Chronicle-Telegraph, August 9, 1915.
52. Ibid.
53. Engineering and Contracting, XLII:9 (August 26, 1914) pp. 196-198 and Sprauge, N. S., "Highways, Bridges of the City of Pittsburgh", Journal of the Engineer's Society of Pennsylvania, 6:11 (November, 1914), pp. 291-297.
54. Ibid. Also Engineering News, 72:23 (December, 1914), pp. 1124-26.
55. This marks the first use of that name for the bridge. All previous news items had called it either the Union Bridge or the North Side Point Bridge.
56. Joseph Armstrong (1868-1931) who had been associated with the construction of the bridge became major in 1914. As Director of Public Works from 1909 to 1914, he helped initiate several important public improvements during that period of which the Manchester Bridge and the removal of the "Hump" on Grant's Hill, were the most important. Other equally important projects were carried out during his term as Allegheny County Commissioner in the 1920's. The Armstrong Tunnels, completed in 1927, were named for him. Charles W. Dahlinger (1858-1933), a Pittsburgh banker and lawyer, is chiefly remembered as a writer on local history.
57. "Ornamental Portals for Point Bridge", Engineering News, 76:26, (December 28, 1916), pp. 1242-1243.
58. Charles Keck (1875-1951) was one of that company of talented and competent sculptors of the Academic, Classical tradition who flourished in the late nineteenth and early twentieth centuries in America. Born in New York, he studied at the Art Students' League and the National Academy of Design. From 1893 to 1898 he was an assistant in the studio of Augustus Saint-Gaudens; although he was a student from 1900 to 1904 in the America Academy at Rome, he continued to receive criticism from Saint-Gaudens.

58. He established a studio in New York on his return to the United States, where in the course of a long career he received commissions for many large monuments and sculptural adornments for public buildings. See Mantle Fielding, Dictionary of American Painters, Sculptors, and Engravers (addendum by James F. Carr) (New York, 1965), p. 484; E. Benezet, Dictionnaire. . . des Peintres, Sculpteurs, etc. (Paris, 1952) V. p. 224; Who's Who in American Art, I (1936-37), p. 231; and American Art Annual, 30 (1933), p. 582.
59. Both photographs of the model for the rejected stone portal and the approved new design are reproduced in Annual Report of the Art Commission, City of Pittsburgh, Pittsburgh, 1916, pp. 8-9. On page 7 photos of the models of the two bronze reliefs are shown. The report also states that the preliminary drawings and models were approved by the Commission on May 4, 1916, and the working drawings on October 9, of the same year.
60. Recorded on the bronze tablet mentioned in number 48.
61. Pittsburgh Post-Gazette, 12 April, 1969.
62. Charles M. Stotz, "Point State Park and the Fort Pitt Museum", Western Pennsylvania Historical Magazine, 52:3 (July, 1969), pp. 263-267.
63. Pittsburgh Sun-Telegraph, June 28, 1959.
64. Interview with George Richardson.
65. As was Theodore Cooper's third Sixth Street Bridge of 1893, the two through-truss spans of which were floated down the Ohio to Corapolis where they were installed in 1926. Even so the top chords of the trusses had to be dismantled to get the barges under the Manchester Bridge.
66. Pittsburgh Press, November 27, 1958.
67. Pittsburgh Post-Gazette, May 22, 1964.
68. Pittsburgh Post-Gazette, August 2, 1964.
69. Pittsburgh Press, June 27, 1927.
70. John Schurko, a local architect, suggested a 350-room motel and a museum atop the Point Bridge and he would like to have had a public library, an art gallery, a restaurant, and shops built on the Manchester (See Pittsburgh Post-Gazette, January 30, 1970). James Lesko, a local artist, wanted to turn the Manchester into a modern American Ponte Vecchi where pedestrians could shop and dine (See Pittsburgh Post-Gazette, 1 November, 1969). In 1967 a group of Pittsburgh artists, known as STL, had also to preserve the bridges for public use in connection with an

70. expanded use of the Point facilities.
71. Coincident with the removal of the bridge ramps the Pittsburgh History and Landmarks Foundation undertook some archeological excavations in the historic Point area. After the steel and concrete has vanished, a number of artifacts were found. See Pittsburgh Post-Gazette, July 10, 1970.
72. Information from the Public Relations Office, Dravo Corporation, Pittsburgh.
73. Pittsburgh Press, July 13, 1970.
74. Pittsburgh Press and Post-Gazette, September 30, 1970.
75. Pittsburgh Press, 28 October, 1970.
76. The first Point Bridge, had been acquired by purchase in 1896, shortly before Brady Street was opened.
77. On authority of George S. Richardson, the Pittsburgh bridge engineer.
78. Pittsburgh is essentially a collection of settlements in valleys among hills. Due to the extremely "broken" topography it has always been difficult here to lay out any large gridiron areas and thus "number" streets in the usual American manner. After the city had reached something of its present dimensions, in 1868, the short streets on the south bank of the Allegheny were numbered as far out as the '60's, but then the pattern disappears. Similarly on the flat alluvial plane of the South Side the streets were numbered but the pattern disappears in the '30's. To differentiate the South Side numbered streets from those along the Allegheny, the titles of the former have always been qualified by the word "South".
79. Soho Run has long since been covered over, but it still appears in the Hopkins Atlas of the City of Pittsburgh of 1872.
80. See the section on the South Side in James D. Van Trump, Arthur P. Ziegler, The Landmark Architecture of Allegheny County, Pittsburgh, 1967), pp. 30-33.
81. White and von Bernewitz, p. 32. The South Tenth Street Bridge has been replaced twice, once in 1903 and again in 1931.
82. Pittsburgh Press, March 22, 1896.
83. Engineering News, 31:15 p. 97; 31:15, p. 310; 31:16, p. 330. 31:19, p. 397 and 31:20, p. 417.

84. Edward M. Bigelow has already been noticed in this study in connection with the first Point Bridge. He was, as well, one of the moving spirits behind the erection of the Brady Street Bridge.
85. Engineering News 32:10; 32:20. p. 415; 32:22, p. 455.
86. Bulletin, 30:4, p. 7
87. The Story of Pittsburgh and Vicinity (Pittsburgh, 1908) p. 100.
88. There is another description of the work of the Schultz Bridge and Iron Company in the Pittsburgh Press, March 22, 1896, p. 17. The company was also contractor for the Schenley Park bridges of the City of Pittsburgh.
89. Engineering News, 33:26, p. 204.
90. Pittsburgh Chronicle-Telegraph, March 25, 1896.
91. This description is contained in "The City's Bridges", Construction, I:12 (March 25, 1905), p. 22.
92. Tyrell, p. 334.
93. White and von Bernewitz, p. 38.
94. Industrial World, July 25, 1910, p. 874.
95. Pittsburgh Post-Gazette, August 6, 1970.
96. Pittsburgh Press, October, 1969.
97. Pittsburgh Press, July 17, 1970.

ILLUSTRATIVE MATERIAL FOR BRIDGE BOOKUnion Bridge (1874-75)

Photographs in photographic archives of the Carnegie Library of Pittsburgh:

B 10 - Point Portal of Union Bridge. Several photos showing both Union and first Point Bridge of which the best are the following: P 1608 (c. 1895).

A 120 (taken from Mt. Washington c. 1896).

B 23 (c. 1900) photo of river steamer trying to pass beneath Union Bridge.

A 307 (c. 1900 - from files of U.S. Army Engineering Corps.)

Photograph of the interior of Union Bridge in White and Von Bernewitz Bridges of Pittsburgh, p. 47.

Point Bridge I (1875077)

Elevation and plan of bridge in Tyrell History of Bridge Engineering, p. 235, fig. 115.

Two pages of engraved plates of drawings for bridge in Engineering News III (8 July, 1876) p. 220, ff. This is the best engineering diagram of the structure. Should by all means be reproduced.

Wood engraving of bridge as opened in 1877 in Scientific American (11 September, 1880). This is also in the Carnegie Library Photo Archive - No. 1433.

Photo taken from hillside just above bridge portal in Pittsburgh Illustrated (1889) - unpagged. This is perhaps best extant photo from this angle.

Carnegie photo archive - see above under Union Bridge. There is also an excellent photo of structure taken from the Pittsburgh shore - L 1363. This is perhaps the best early photo (c. 1892).

Photo of both old and new Point Bridge side by side in White and von Bernewitz. The Bridges of Pittsburgh, p. 33.

(Bridges)

2Manchester Bridge (1911-1915)

Photo as nearing completion in N. S. Sprague "Highway Bridges of the City of Pittsburgh" in Journal of the Engineers' Society of Pennsylvania, 6:11 (November, 1914, pp. 291-297. Photo on p. 294.

Two photos of structure in White and von Bernewitz, The Bridges of Pittsburgh - p. 12 - sculptured portal, p. 47 - over-all view.

Photos of ornamental portals of bridge in Engineering News 76:26 (28 December, 1916). pp. 1242-1243

Photo of interior of bridge taken in September 1950 in Carnegie Photo Archive - A 1012.

Photo of Point in 1947 showing both Manchester and Point II bridges in Carnegie Photo Archive - L 1436.

Point Bridge II (1925-1927)

Preliminary sketch - Charette 6 (June, 1925) frontispiece.

Final drawing - Charette 5:10 (October, 1925). frontispiece.

Photo of interior in Pittsburgh Post Gazette, 1 November 1969. An excellent photo made from a poster by James Lesko.

There are a number of good photos of the demolition of both the Manchester and Point II bridges in the Pittsburgh newspaper of 1970.

Brady Street (South twenty-second Street) Bridge (1895-1896)

Elevation drawing in Tyrell, History of Bridge Engineering, p. 334, fig. 238.

Photo in White and von Bernewitz The Bridge of Pittsburgh, p. 38

Wood engraving (large cut) of entire bridge and smaller one of ornamented north portal in Pittsburgh Press of 25 March 1896.

Drawing of bridge by W. G. Walter in the Pittsburgh Bulletin
30:4 (1 December, 1894), p. 7

Photo of bridge taken from hillside above Soho with piers of
the new bridge in Pittsburgh Post Gazette, 6 August, 1970.

Views of the Point before construction of bridges - and after.

Photographs in Carnegie Library photo archive

Views of the Point from an engraving after a water color made in
1817 by Mrs. C. F. Gibson of Philadelphia - L 1296

View taken from Mt. Washington in 1849.

A colored lithograph by Tappan and Bradford after a contemporary
drawing by B. F. Smith - A 505

Also the same view from an engraving in the Pennsylvania Room
of Carnegie Library - L 157.

View in 1850, used as a letterhead - B 24

View taken from Gleason's Pictorial for 30 April, 1853. Wood
engraving, very tenebrous and Romantic - L 224.

View in 1923, photograph, showing both Manchester and Point II
bridges - L 1434

View in 1964, photograph, showing both sets of bridges -
Manchester and Point II as well as the new Fort Duquesne and
Fort Pitt bridges. - P 1646

Addendum to:
Brady Street Bridge
(Twenty-Second Street Bridge)
Spanning the Monongahela River
Pittsburg, Pennsylvania
Alleghany County

HAER No. PA-3

HAER
PA,
2-PITBU,
3i-

PHOTOGRAPHS

Historic American Engineering Record
National Park Service
Department of the Interior
Washington, D.C. 20240

ADDENDUM
FOLLOWS...

ADDENDUM TO
BRADY STREET BRIDGE
(South Twenty-Second Street Bridge)
Spanning Monongahela River
Pittsburgh
Allegheny County
Pennsylvania

HAER No. PA- 3

HAER
PA,
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31-

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