

Prescott Bridge
Spanning the Lamprey River on Prescott Road
Raymond
Rockingham County
New Hampshire

HAER No. NH-16

HAER
NH,
8-RAYM,
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
MID-ATLANTIC REGION, NATIONAL PARK SERVICE
DEPARTMENT OF THE INTERIOR
PHILADELPHIA, PENNSYLVANIA 19106

HISTORIC AMERICAN ENGINEERING RECORD

PRESCOTT BRIDGE

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Location: Spanning the Lamprey River on Prescott Road, Town of Raymond, Rockingham County, New Hampshire.

Quad: Mt. Pawtuckaway Quadrangle, New Hampshire 1957.

UTM: 19.324800.4765800

Date of Construction: 1917

Engineer: United Construction Company, Albany, New York

Present Owner: Town of Raymond
Raymond, New Hampshire

Present Use: Vehicular bridge

Significance: Prescott Bridge is believed to be the sole surviving example of an I-beam through bridge with transverse jack arches extant in the state of New Hampshire. Constructed in 1917, Prescott Bridge is the last example of a popular bridge form built widely throughout the state, an example of what the United Construction Company called "a standard two-beam girder bridge." The structure is one of three bridges erected in Raymond in 1917 by the United Construction Company of Albany, New York, a contractor for the American Bridge Company. Prescott Bridge added a link to the network of north-south access across the flood prone Lamprey River on the eastern edge of the town of Raymond.

Project Information:

This documentation was undertaken in December and January, 1988-1989 in accordance with the Memorandum of Agreement prepared by the Federal Highway Administration, the New Hampshire State Historic Preservation Office, and the New Hampshire Department of Transportation and accepted by the Advisory Council on Historic Preservation as a mitigative measure prior to replacement of the bridge in 1989.

Prepared by Lynne Emerson Monroe, Preservation Company, 5 Hobbs Road, Kensington, New Hampshire, for the New Hampshire Department of Transportation, Concord, New Hampshire.

Site Features and Historical Background

Prescott Bridge is located on the Lamprey River at the eastern border of the town of Raymond, New Hampshire. The Lamprey River is formed from two smaller streams, which join in the northwest corner of Raymond to form the powerful stream that flows east, roughly bisecting Raymond, on through the towns of Epping, Lee and Newmarket, to meet the tidal waters of the Great Bay and the ocean at Portsmouth (Appendix 1).

The period following the town of Raymond's incorporation in 1764 was a time of expansion in the town as the population grew from 455 in 1767 to 731 in 1783. The town's building stock expanded accordingly and two important farmsteads were built in the section of Prescott Road directly abutting the bridge. These farmsteads are historically known as the Jedediah Brown House, c. 1773 and the Ebenezer Prescott House, c. 1793 (Monroe 1988:4). The earliest known documentation of a bridge at this crossing is a letter from the collection of Mrs. Luie Morse, owner of the Prescott House. This letter was written by Elisha Prescott to his uncle describing the death of his father, Ebenezer. Ebenezer met an untimely death of January 8, 1800, when he was thrown from his sleigh, when his horse slipped on the ice while crossing the bridge over the Lamprey River near his house. His widow also died shortly thereafter from injuries sustained in the same accident. Jedediah Brown, who was also in the sleigh, survived the tragedy.

The form of the bridge at that time is not known. The granite abutments of the current bridge were built some time after 1830. This is documented by the quarrying techniques evidenced on the granite blocks which began in use in New Hampshire after 1830 (Garvin, J., interview, 1989). The town of Raymond kept detailed records of repairs to their highways, which consistently included the date of the work performed, the work performed, the person performing the work and the amount he was paid, but they never included the location at which the work was done. This made it impossible to trace when repairs or construction of early bridges were accomplished (Town of Raymond 1850-1930).

The major transportation network in Raymond has historically been in an east-west direction, roughly bisecting the town. The Lamprey River runs in this course, and was followed by the major roads which cross at the town center. Roughly a hundred years after settlement, the railroad followed the same path. Now, a hundred and fifty years after the railroad, the major east-west highway in the southern part of the state of New Hampshire developed in the same path, using, for much of its length, the railroad right-of-way. Settlement was aided by the development of a series of north-south roads which ran the range lines. Most of the historic farmsteads were built on these roads using the hundred acres of back land for farming.

Historically the role of Prescott Bridge in the local highway system appears to have been to provide a link on one of these north-south routes with the mills that developed in the smaller village center of Freetown and to open up sections of farm land. Later development in the town left this area isolated which, ironically, accounts for its fine state of preservation in the present. Recent development of housing, however, threatens to change the character of this isolated section of the town. The farmland, which is no longer viable for farming, is extremely productive for development housing, and the section of Prescott Road nearest the border is facing heavy development pressure.

Historically, bridges in Raymond and throughout New England were made of wood. The first steel bridges in Raymond were introduced at a special town meeting held in 1914 (Purinton 1914:1). The town undertook a campaign to replace all of its existing wooden bridges with steel bridges, pursuant to an article passed by the state legislature requiring heavier carrying capacities, Laws of the State of New Hampshire, Passed January Session, 1913. All of these bridges were done under contracts with the United Construction Company (Town of Raymond 1917:10). They were small, simple I-beam, and single and double spans on granite abutments.

Bridge Description

Prescott Bridge is a single span, I-beam through bridge of transverse concrete jack arches bearing upon dry masonry, cut granite abutments. The two lane structure, aligned on a northwest-southeast axis, is 40' in length out-to-out, with a deck width rail to rail of 16'4".

Two rolled steel I-beam girders, each 40 feet long, are exposed on the side elevations of the deck, and engaged in the top course of the granite abutment. The bridge deck is seated directly upon the stone masonry abutments. These girders are 1/2" thick, 27" deep with a 9" flange. Transversely is a series of 12 cross I-beams running from side to side, measuring 15'8" with a 4-1/2" flange. These cross beams are riveted to the girders with a grouping of four rivets at the base of each girder and a cross plate. The arches were formed of corrugated steel and concrete and the steel plates were left in place. The road surface, or wearing course, is asphalt. Underneath the series of jack arches is a wooden cribbing, which was bolted to the bottom flanges of the I-beams at each I-beam. This cribbing (date unknown) was likely added to hold the concrete, which was spalling.

The two bridge railings consist of five pipe posts with two pipe rails running between.

The two cut granite, dry-masonry abutments are massive. They are U-abutments, with parallel wing walls. These abutments pre-date the

existing steel bridge and supported an earlier wooden bridge, date unknown (Photograph 19). Some of the granite stones show evidence of having been quarried after 1830 (Photograph 8); the plug drill marks are clearly visible. The plug drill was used in this area after 1830 and is still in common use. The wing walls are longest on the southwest elevation. The river channel widens on this side of the bridge, and the abutments are accordingly longer.

Prescott Bridge is in poor condition and has been posted for lower loads. The wearing surface of asphalt is heavily cracked and patched, and the structural condition of the deck is poor, with heavy spalling and leaking. The pipe railing is substandard for today's usage. The girders are heavily rusted, with substantial steel loss. The floor beams have heavy rust and steel loss on the lower flanges. The abutments have several stone voids and a few cracked stones (New Hampshire Department of Transportation Bridge and Road Maintenance Records).

Construction

The name "Brown's Bridge" is used extensively in the 18th century deeds and letters which first document this crossing. Later this bridge is referred to as the Prescott Bridge, most specifically in the town reports of 1916 describing its replacement. The name "Brown's Bridge" refers to Jedediah Brown, who built a house here at the end of Page Road in 1773 (Monroe 1988:3). This house remained in the Brown family, but changed names when Plummer Corson purchased it from Jedediah Brown in 1867 (Brown to Corson). The Prescotts built their house in the area in 1793 and continued direct lineage until the mid-20th century (Monroe 1988:5). The houses are now commonly known locally as the Plummer Corson House and the Elisha Prescott House, accounting for the change in the name of both the road and the bridge.

Although there are historical references to a bridge in this location, no details as to its construction are known. (See Section 1.) The annual town reports of the town of Raymond describe replacements and repairs to bridge materials, such as stringers, but never describe work by location, so it is impossible to know which repairs were done on Prescott Bridge. The first specific record referring to this bridge appears in the annual report for the year ending February 15, 1917. The item listed under "Outlay for New Construction and Permanent Improvement" lists work on the Prescott Steel Bridge, United Construction Co.....\$1040.00. The total amount of money spent that year on new bridge construction was \$2880.00. Two other steel bridges were built that year, the Stingy Steel Bridge, for \$340.00, and the Freetown Steel Bridge, for \$1500.00. All of the work was done by the United Construction Company of Albany, New York. These actions were the result of a decision to upgrade the town's bridges made at a special town meeting as follows:

Minutes of Special Meeting, August 1st, 1914
Meeting was opened by the Moderator Walter J. Dudley
Warrant was read by the Moderator.

Art. I To see what action the town will take relative to rebuilding the highway bridges throughout the Town, that they may safely sustain the load requied by Chap. 19 of the Session laws of 1913.

Motion by C. J. Whiting that we replace all the bridges in the town as they need to be replaced, with Steel and Concrete. It was so voted in the affirmative.

Motion by Sherburn Gove that the expense of rebuilding the bridges be provided for by a bond issue not to exceed Eleven Thousand dollars (\$11,000) at 4% to run for Twenty Years
And that the Selectmen apply to the next Legislative for an act allowing the same. It was so voted in the affirmative.

Art. 2

Motion by Geo. E. McClure that the completion of the State Road be left with the Selectmen. It was so voted in the affirmative.

No other business to come before the meeting it was so adjourned.

A true record

Attest:

George W. Purinton
Town Clerk

In 1914, the annual report shows a steel bridge account item paid to the United Construction Co., "bridges as per contract", was \$5150.00. railing was purchased from the Wallworth Manufacturing Company for \$3.82. However, the location of these bridges was not listed.

The aforementioned Chapter 19, Section 1 of the Laws of the State of New Hampshire, passed in January of 1913, amended Chapter 76, Section 3 of the Public Statutes passed in 1891 for "DAMAGES HAPPENING IN THE USE OF HIGHWAYS. LAW OF THE ROAD." This act made towns liable for damages through defect of highways, but made towns not liable when the load exceeded 5 tons. With the advent of the automobile and the deterioration of New Hampshire's roads and the inadequacy of wooden bridges, it became clear that most loads would indeed exceed 5 tons. The new law of 1913 made the towns not liable if loads exceeded certain amounts. These laws were supporting the general campaign for better roads and highways which was taking place across the state (Garvin and Garvin 1989:185).

Originally, there was a builder's plate affixed to this bridge, which has been missing for approximately six years. The location of the plate was on the southwest side of the bridge, near the southeast corner. This plate read "Constructed in 1917, Selectmen, Plummer B. Corson, Ivan B. Morrison and Will B. Gile." (Morse, L., interview 1987, 1989).

Plummer B. Corson was a prosperous farmer who married into the Brown family and purchased the Jedediah Brown homestead and 120 acres in 1867. The land is clearly described in the deed as connecting to the river, beginning "at a bridge near said Prescott house and known as Brown's Bridge." (Brown to Corson). Ivan B. Morrison, who was a selectman during this time, was a mailman (Morse, interviews). Will B. Gile seems to have been something of a local character with no known profession. Sherburn Gove, who was road agent at this time and selectman in 1916, was a locally prominent builder. Other selectmen in 1916 were Andrew C. Smith, who was a farmer, Walter J. Dudley, who was also a farmer (Gove, I., interview 1989).

The former wooden bridge, which was built at an unknown date, consisted of wooden beams (stringers) running lengthwise exactly the same length as the current girders, with a board deck running in a transverse direction. The railings were made of wooden posts with flat boards stretching between. The top rail was a log. At the end, on each abutment, large, cut granite blocks served as terminal posts for the railings (Photograph 19).

The road surface of the former wooden bridge and the original steel bridge was gravel. It was paved during the 1940's. The road was still unpaved as late as the burial of Joseph Prescott in 1932. (Joseph Prescott was buried in either March or April, and it was too muddy for the hearse to pass on the road to the Prescott Cemetery) (Morse, L., interview 1987, 1989).

The history of the United Construction Company is closely tied to the history of the American Bridge Company. According to Matthew Roth and Bruce Clouette "The American Bridge Company is a classic example of the monopolistic practices of big business at the turn of the century. J. P. Morgan "the capitalist's capitalist" incorporated American Bridge in 1900. The company lasted barely a year as an independent entity, because United States bought most of the stock of the new firm and operated it as a subsidiary. In its first year, American Bridge purchased twenty-four companies, representing fully one half of the nation's fabricating capacity at that time. Eight of the purchased firms were in New York, and they operated under the umbrella organization known as Empire Bridge Company, a subsidiary of American Bridge Company. Another subsidiary, American Bridge Company of New York also took charge of construction, unless another building firm won the job in its own right and simply ordered the steel from American. American Bridge opened a new fabricating

plant in Ambridge, Pennsylvania, in 1903 and began de-commissioning the older plants of the purchased firms. The new plant was by far the largest in the country, three times bigger than the prior record holder. Until a major corporate reorganization in 1914, much of American Bridge's work in Vermont and New Hampshire came through United Construction Company, a nominally independent contracting firm based in Albany, New York. After 1914, the number of joint contracts between the two firms diminished, although later examples exist. American Bridge is still in business today as the nation's largest structural fabricator" (Roth and Clouette 1985:A6-2,3).

United Construction had its main offices in Albany, New York. The first listing for the United Construction Company in the Albany directories is in 1902 with offices at 467 Broadway. Later they are listed at 24 James Street, and by the 1930's the United Construction Company is no longer listed. In the business directories they are listed under "Bridge and General Construction." The directors listed are Homer R. Briggs, James R. Watt and John H. Hoff. Later directors include Arthur H. Kitteredge, secretary, Walter R. Marden, vice president and civil engineer, and James R. Watt, president and treasurer. James Watt was the mayor of Albany after World War I, from 1918 to 1921 (City of Albany 1902-1930).

Arthur H. Kitteredge started his own construction firm in the early 1920's. Called the Kitteredge Bridge Company, it was a construction firm based in Concord, New Hampshire. "Kitteredge ran the bridge department for the Colburn Construction Company, also of Concord, before beginning his own firm. It appears that Kitteredge may have taken over the Colburn business and changed its name. Kitteredge Bridge, like so many others, benefited from the enormous demand of the 1928-1930 reconstruction program, winning a contract to construct a span fabricated by American Bridge Company. Like many others, this firm did not survive the 1930's" (Roth and Clouette 1985:A6-7).

United Construction and Kitteredge both had contracts and relations with John W. Storrs. Storrs was appointed first state engineer by Governor Batchelder in 1913. He was a civil engineer who was well known in New Hampshire and throughout New England. In 1918, he published a handbook for the use of those interested in the construction of short span bridges. Storrs urged the replacement of existing bridges with steel spans. He predicted that state improvements to roads would encourage heavier loads. Even as early as 1905 Storrs predicted the new challenge, both to road surfaces and to bridges - the automobile. "The impact caused by automobiles is a serious strain on bridges, the effect being similar to that of a train of railroad cars." (Garvin and Garvin 1988:189).

Design and Technology

Prescott Bridge appears to be the last surviving bridge of its particular type of through I-beam girder bridge with transverse jack arches surviving in the state of New Hampshire. This bridge was designed by the United Bridge Company of Albany, New York and listed in their plans as "Standard Two Beam Girder Bridge". It was an extremely popular design and many examples of it were built. The difficulty with this type of bridge is that its obsolescence is inherent in its basic design. The entire load is carried by the two girders so that if something happens to one or the other, the entire bridge has to be replaced. Since this design was easy to build, many of them were built throughout the state, but most of them received more use and had to be replaced sooner than this one which was isolated in the back woods of Raymond.

One other problem with the two beam girder bridge is that there was no way to widen it as needs changed. It was set at the width it was built. Since it was impossible to repair or widen, replacement was the only remedy.

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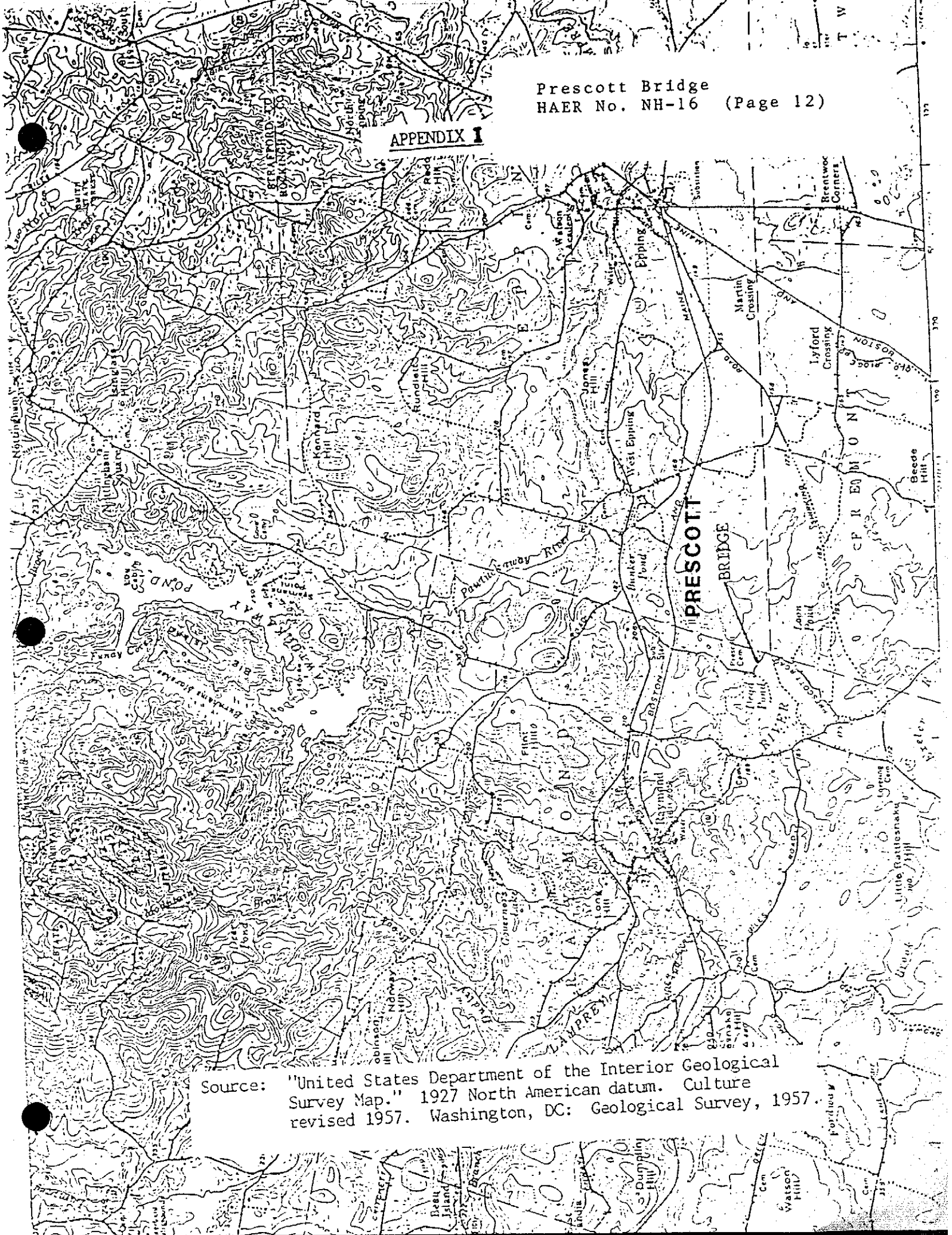
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APPENDIX I



Source: "United States Department of the Interior Geological Survey Map." 1927 North American datum. Culture revised 1957. Washington, DC: Geological Survey, 1957.