

COVERED BRIDGES

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IN 1841 Charles Dickens visited America and when he returned to England he had some varied experiences to record, often in a critical way, of places and things he had seen in the United States. One such experience I wish to cite here. "We crossed the river by a wooden bridge, roofed and covered on all sides, and nearly a mile in length. It was profoundly dark, perplexed with great beams, crossing and recrossing it at every possible angle; and through the broad chinks and crevices in the floor, the rapid river gleamed, far down below, like a legion of eyes. We had no lamps; and as the horses stumbled and floundered through this place, toward the distant speck of dying light, it seemed interminable. I really could not at first persuade myself as we rumbled heavily on, filling the bridge with hollow noises, but what I was in a painful dream; for I had often dreamed of toiling through such places, and as often argued, even at the time, 'This cannot be reality'."¹ The bridge in question was one over the Susquehanna River at Harrisburg.

After more than a century we can view with different eyes what the covered bridge has meant in the development of our country, practically as well as sentimentally. Bridges are more than just useful structures. They are the familiar and romantic landmarks of our countryside. The first question that naturally arises when the individual sees a covered bridge is: Why was the wooden bridge covered with a roof? Simply, one can answer by asking another question: Why is a roof put on a barn or a house? Primarily, of course, a roof over a bridge preserved the wooden structure from rotting during the summer and from freezing its joints during the winter. Yes, there were other, though less important reasons, for roofing the bridge: to keep the roadway dry, for the floor was often

An address delivered before the Society by C. W. W. Elkin, M.D. on March 24, 1958. Dr. Elkin, Secretary of the Historical Society, is widely known as a physician, but he is also an archaeologist and historian. His paper "Remarks on Some Old Cemeteries in the Pittsburgh Region" in Volume 38 of this magazine is one of great interest and is in frequent demand.—Ed.

¹ Dickens, Charles. *American Notes*

oiled and was slippery when wet; to strengthen the structure; to give the bridge a barn appearance and thereby remove the fear of farm animals in crossing a rushing stream. The real reason for covering the bridges on top and sides was, as the farmer in New England stated it, the same reason that women wear petticoats—"to protect their underpinning." There were other less common uses made of the covered bridges. They served as protection against snow and rainstorms, as places for town meetings, as assembly and drilling ground for troops (during the Civil War), as background for advertising circuses and religious meetings, and as toll houses. But one thing that the covered bridge did that was not welcomed by the farmer with horses and sled was keeping the snow off the roadway. Probably few people of today ever heard of the expression "snow the bridge," but it was common fifty or sixty years ago when farmers used large sleds for winter hauling and fancy cutters were common. Since the roof of the bridge protected the floor, no snow fell inside on the bare floor. To overcome this obstacle to travel, either the driver of the horses or the farmers living nearby had to shovel or haul snow and spread it over the floor deep enough to permit the load to be hauled through.

Long before the National Pike came into existence, bridges were built across the Connecticut and Schuylkill Rivers. These first permanent bridges, made entirely of wood, were masterpieces of timber construction. They set the pattern for the thousands of covered bridges that were built from Maine to California. Among the most famous pioneer bridge builders were Timothy Palmer and Theodore Burr. They learned the art of timber construction in New England. The New Englander's skill as a wood joiner is well known. His barns, his wooden bridges are proof of his ingenuity in putting to good use the magnificent virgin forest that hemmed the coves along the coast and lined the river banks.²

The old National Pike, opened in 1818, created a means of reaching the developing West. The Pike crossed many streams requiring wooden bridges. Over them passed many noted persons on their way to Washington and the East. Henry Clay was a frequent traveler on the National Pike. Once he was crossing Dunlap's Creek (Fayette County) on an old wooden bridge when it gave way, dumping the statesman into the stream below. As he was helped

² Slone, Eric. *American Barns and Covered Bridges*

up the bank, he was heard to remark angrily that here was a case where "mud and clay did not mix."

As communities developed along the main highways to the middle and far west, the building of covered wooden bridges continued as in the east. These bridges were constructed largely by the rule-of-thumb methods handed down from one generation to the next. Hundreds of these bridges are still used on the main highways as well as on the rural roads from Ohio to the Pacific Coast—evidence that the original forests, largely of pine, extended over most of the middle west and Rockies.

While most bridges were constructed by local carpenters, the types were invented and patented by well known designers who gave their names to the type of truss used. The first American patent for a covered bridge was issued January 21, 1797, to Charles W. Peale, the famed painter of George Washington, who planned a bridge over the Schuylkill River. Other designers or engineers who became prominent in the early days of bridge building were Palmer, Burr, Town, Warren and Howe, whose names were attached to certain types of trusses.

While the virtues of the Burr truss were recognized by local bridge carpenters, they made their own slight variations. Although Burr's mode of construction was patented, his rural imitators never knew they were infringing on his patent. In one form or another his form of arch truss was used wherever timber bridges were built for over the next hundred years. One of the largest and most beautiful covered wooden bridges of the early 19th century was Weinwag's "Colossus" Bridge over the Schuylkill near Philadelphia. This bridge had a clear span of 340 feet, with two lanes of traffic, supported by five parallel trussed arches, sided with evenly spaced windows, with neoclassic portals. It burned down in 1835.

The simplest type of bridge, uncovered, was the corduroy bridge of logs where sawed lumber was not available (17th century). In the 18th century a truss was added to increase its strength. This truss was later boxed in to protect it from the weather; later it was roofed, and still later the framework was covered on top and sides. The ideas of construction went back to ancient principles. The simplest and first truss tried in America was the king-post truss. This consists of a center upright or king-post in the middle of the span, with two compression pieces slanting downward and outward toward each shore (an inverted V shape). This arrangement was

limited to small bridges because the compression pieces were limited in length. For longer bridges two uprights were spaced across the span and the result is a queen-post truss. By using a cross instead of an inverted V in the middle of a queen-post truss, a stronger design resulted, called a Warren truss. All these simple trusses were already used in barn structures, so the barn builder was right at home constructing small bridges.

A short covered bridge is very much like a barn with its ends left open. By the addition of extra diagonal bracing that would tie the upper and lower beams or chords together, such a barn could serve as a bridge. Most wooden bridges are supported by two parallel timber trusses resting on stone abutments. Burr's special innovation was the placing of a heavy bow or arch the length of these two trusses. The arch was fastened securely to the uprights and diagonals that formed the truss, while the two ends of the arch extended below the floor of the bridge and rested on the masonry foundations. Thus, Burr strengthened the truss by means of the arch.

The king-posts and queen-posts could not be enlarged indefinitely; to strengthen them Theodore Burr devised a series of king-posts combined with an arch. One of Burr's bridges was built across the Hudson at Waterford in 1804, and remained in good condition until burned over a hundred years later. So many bridges are traced to Burr that he is called by many the father of American bridge building. The lattice-truss type of bridge was designed and patented by Ithiel Town in 1820. This type is seen in most of the Vermont bridges.

If the bridge was laid out first on land it was made with a slight arch or camber to it to take care of any sag when put in place—an accomplishment that required skill on the part of the builder. Some of the single spans reached well over 100 feet.

Four types of siding were used in the construction of covered bridges: lap siding, drop siding, double V barn siding, and plain sheeting boards. Lap siding was usually used on older buildings. Drop siding was generally called weatherboarding. Most bridges of later construction were covered with plain sheeting board. Lap siding and drop siding were laid horizontally; double V barn siding and plain sheeting were laid vertically. On most bridges with plain sheeting the cracks were stripped to keep out the weather. Lap siding was generally cut from oak, often with a whipsaw; drop siding and double V barn siding were pine, and plain sheeting was

usually oak. Spruce or pine was used for most of the covered bridges, hemlock for a few. Oak was usually employed in the flooring, and the roofs were usually made from split oak shingles. The sides of the bridge were covered with oak or pine siding.

Because most of the covered bridges were constructed by local carpenters, their tools were largely those used in building barns. The trees used as beams were felled by ax and later by crosscut saw. Shaping the tree into a suitable timber was done in many cases by the broadax and adze. In some cases long beams were sawed with the pit saw with a man on each end of the saw. Later much of the sawed timber was made with an up and down saw run by water power. Still later the circular saw was usually employed. For crosscutting lighter material the bucksaw was used. For boring holes for the connecting wooden pins the early oak brace and later the auger were employed. Pins were shaped from oak or hickory wood.

Since many of the covered bridges were constructed a century or more ago, by necessity they were, like barns, built of wood that was plentiful, as pine, hemlock and oak. This made the most of construction and materials quite reasonable—many cost less than \$1,000. In the early days of wooden bridge construction little help could be expected from county, state, or town authorities. Often a group of farmers or business men would organize and agree to build a covered bridge and maintain it. Often shares were sold and eventually redeemed through tolls. In a majority of cases the covered bridges were planned and built by local carpenters, and just like barns, the framework was often laid out on the ground and raised by men of the neighborhood. Simple instruments were necessary, and wooden pins rather than nails and spikes were used to fasten the framework together.

Now, more specifically, a word about the bridges of the immediate locality. The first bridge in Pittsburgh was a covered wooden one over the Monongahela River at Smithfield Street. A charter for this bridge was applied for in 1810. The Bank of Pittsburgh, chartered in the same year, made an offer to give \$20,000 to this and to the proposed Allegheny River bridge in case the charter was issued. Although this charter was not issued, a new one was signed in 1816. Under this charter a company was organized on July 8, 1816, with the following officers: President William Robinson, Jr., and James Adams, Ebenezer Denny, William Hays and

Alex Johnston, Jr., as Treasurer. The Monongahela Bridge cost about \$100,000. It was opened for traffic in November 1818, to the accompaniment of cannon salutes, drums and fifes of the swank military companies. Its superstructure was entirely of wood with shingle roof and weatherboarded sides containing windows at intervals. It had two abutments and seven piers of stone. It gave good service until 1832 when a sinking pier caused two arches on the Pittsburgh side to fall. It was completely destroyed by the Great Fire of April 10, 1845. The piers had been repaired and were retained in the new Roebling steel bridge. As late as the Civil War period there were only four bridges crossing the Monongahela up to Brownsville. These were the Smithfield Street Bridge and the three wooden ones at South Tenth Street, at Monongahela (1830), and at Brownsville. Now there are twenty-nine. The original Tenth Street Bridge was built and opened in 1840. The old wooden bridge at Brownsville was the occasion of prolonged litigation, the Federal Government opposing it as an obstacle to navigation, and forcing the old structure carrying the traffic of the National Pike to be torn down.

The first covered bridge across the Allegheny River was completed in 1820, extending from St. Clair Street (now 6th Street) to Federal Street. The cost was about \$80,000. It was opened with a banquet on the bridge. Tables extended the entire length of the bridge.

Over the bridge ran the stage coaches en route to Franklin via Federal Street and Butler. It was a dismal passageway but improved somewhat by the installation of gas lamps in 1837. Over it came many dignitaries and presidents. A suspension bridge replaced it in 1860, built largely on the old piers. Another covered bridge over the Allegheny was at Hand (now 9th) Street, completed in 1839. It was 1027 feet long, 42 feet wide with walks 12 feet wide, with hand railing and lattice work; there were two abutments and four piers. This was built by Sylvanus Lothrop who built the canal aqueducts here and at Freeport. In 1846 there was a legal contest to free the bridge of tolls, but in spite of the arguments of the brilliant Edwin M. Stanton, the bridge continued to collect toll. In addition to sidewalks the bridge had a promenade on top which was a fashionable resort. It was later closed because of the questionable female characters that paraded across it. The Mechanics Street (16th Street) Bridge was opened in 1838; it was burned down in 1851, rebuilt and then torn out by flood in 1865. Again it was rebuilt.

One of the last wooden bridges over the Allegheny River to be removed was the one at 43rd Street. Some of you may remember this bridge, as well as the Manchester Bridge at the Point, built in 1876.

All of these early bridges were maintained by tolls, usually one or two cents for males, free for women, with variable tolls for vehicles and animals. In the case of many early covered bridges it was the custom to raise bridge money by lottery, which was legalized by special acts of law wherever the Church frowned upon gambling. Because these toll bridges were frequent money makers, their number sometimes got out of control. One bridge owner built a tavern on the other side of the bridge. This meant a two-way toll for each trip. But often free access was given to doctors, clergymen, large families and church goers. The toll taker was usually a town character who could graciously take criticism, and pass on all the local gossip and scandal. Some kept diaries that were valuable on local history.

When these early bridges were opened for traffic, they reduced the importance of ferries which were handicapped in their service in times of high water or frozen rivers. Not only did the bridges make foot travel more convenient but they opened up a tremendous business traffic between the city and surrounding towns.

Pennsylvania's picturesque covered bridges are rapidly disappearing, the Department of Highways recently revealed. In 1945 there were 359 such bridges on the State highway system; at the last report only 132 of them survived destruction or replacement. Presumably many other bridges maintained by counties are meeting a like fate. "Painters and poets, photographers" and all others who enjoy scenery will be sorry to see the old bridges go. Henry Ford thought enough of covered bridges to buy and transport a bridge that crossed Wheeling Creek between Washington and Greene Counties and rebuild it in his Greenfield Village at Dearborn, Michigan. The great state of Pennsylvania which has the largest number of covered bridges in the United States can scarcely do less than preserve one of each of the different types of bridges still in good condition. Future generations will thank the past and present generations for their thoughtfulness.

Perhaps it comes as a surprise to most people to know that covered bridges have been constructed as late as 1943 when the Lippincott bridge over Ruff Creek in Morgan Township, Greene County, replaced another wooden bridge nearly a century old. Only

28 feet in its span, it was constructed of wood because iron was not available due to World War II demands.

Previously, it was mentioned that the covered bridges of Pennsylvania are disappearing rapidly. On the 18th of March, 1958 the Oyster Mill bridge in East Pennsboro Township, with three 123 foot spans over Conodoguinet Creek, one of the longest covered bridges in the state, was destroyed by fire. This bridge was built in 1881 at a cost of \$5,410.

The last covered bridge built in Pennsylvania, and probably in the United States, was a private one over Darby Creek near West Chester, constructed by Robert Smith in 1952. That many of these recently built bridges in the East were built from parts of an older bridge is shown by the fact that many of the beams were hewn rather than sawed. And, of course, the presence of wooden pins rather than spikes and bolts helps to place the date of construction.

It is impossible to determine accurately the number of covered bridges in the United States, in any state or county, since some are maintained by the state, some by the county, and a few by townships. In 1954 Richard S. Allen listed 1617 covered bridges in the United States, with 390 credited to Pennsylvania, without differentiation of state and county maintenance. The latest report of Pennsylvania state-maintained bridges by Secretary of Highways is given at 129, with a loss of thirteen bridges in the past two years. Greene County continued to lead in number of bridges: 20 state-maintained, 11 county-maintained, and two maintained jointly by Greene and Washington Counties. Washington County has ten state and 17 county bridges. The next counties in number of bridges are Bedford and Columbia Counties with 14 each.

The longest covered bridge on the Pennsylvania state system is the one over Conodoguinet Creek in Cumberland County. Its two spans cover 318 feet. The oldest covered wooden bridge on the state system still standing was constructed in 1834 over the Tulpehocken Creek in Berks County; it has a span of 141 feet. Only two bridges are posted to carry up to 15 tons: one in Indiana County, one in Perry County.

Again may I make a plea for the preservation of a few of the best types of covered wooden bridges in Pennsylvania. With this in mind I close with a quotation:

The world goes on with noise and clatter
 Old landmarks down—what does it matter?
 A bulldozer here, an ax blade there
 A covered bridge—then empty air!³

BRIDGES REMAINING IN COUNTIES OF WESTERN PENNSYLVANIA

ERIE

Five, all Burr Type:

- (1) On Keepville-Tracy Road 1½ miles N. W. Pennside—in bad shape.
- (2) On McKee Road—over west branch of Conneaut Creek—known as Sherman covered bridge—from builder.
- (3) Low Bridge on McKee Road, ½ mile west of East Springfield, built in late 20's, in good condition.
- (4) Gudgeonville Bridge, southeast of Girard, 90 feet, built in late 1860's, well maintained. In the most picturesque spot, in a deep valley, reached by a winding road, over Elk Creek.
- (5) Waterford Covered Bridge over Le Boeuf Creek 1½ miles southeast of Waterford. Built in 1870's.

In 90's there were 15 covered bridges, one a two-way at Cherry Hill—gone 40 years.

Framework of Burr bridge of heavy plank 4"x16"

WARREN—CRAWFORD—FOREST

None

WESTMORELAND

Only one covered bridge remains—Bell's Mill Bridge (a county bridge over Sewickley Creek, between Sewickley and South Huntingdon Townships), ½ mile east of Route 71, between Madison and West Newton.

Bell's Mill Bridge—one span, 104 feet wide, 6"x12" arch, 6"x6" stringers. Lap siding.

LAWRENCE

- (1) Banks Bridge over Neshannock Creek, off Volant-Neshannock Falls Road. One span 134 feet. Built in 1889; in good condition.
- (2) McConnell's Mills Bridge over Slippery Rock Creek off Route 422, 11 miles east of New Castle. One span of 108 feet, built in 1874, in good repair. Part of a State Park.

³ Stull, Gail R. quoted in the *Pennsylvania Farmer*

If you want personally to have and own a covered bridge, just a short time ago (March 15, 1958) there was offered to anyone who will take it away, a bridge spanning Smith's Brook near Newfane, Vermont, to be replaced by a steel-concrete bridge.

BRADFORD

One bridge over Brown's Creek at Luthers Mills. Built in 1853. One span of 95 feet. In good repair.

GREENE

Eleven bridges maintained by County, two by Greene and Washington Counties, fifteen by State. One in Carmichaels, over Muddy Creek; one in Waynesburg over Purman Run.

WASHINGTON

Eight State covered bridges and 19 by County. Single spans, 18 to 104 feet.

NOT HEARD FROM:

FAYETTE—BEAVER—BUTLER—JEFFERSON—INDIANA—
ARMSTRONG

None but Indiana has any State or County bridge.

Note: A letter requesting information concerning covered bridges was sent to the commissioners of all the above named counties. C. W. W. E.

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4. Slone, Eric. *American Barns and Covered Bridges*. New York: Funk & Wagnalls, 1954.