Suzanne Jamele

From: Eric Gilbertson
Sent: Tuesday, June 04, 2002 2:31 PM
To: Suzanne Jamele
Subject: FW: Lord's Creek Bridge

lordscrk.royce.jpg orne.walker.jpg

The Covered Bridge Society has a list of bridges that are not on the NR.
A project?

Eric Gilbertson, Deputy State Historic Preservation Officer
Division for Historic Preservation
National Life Building
Drawer 20
Montpelier, VT 05620-0501
(802) 828-3043

To visit the Vermont State Historic Sites:
http://www.historicvermont.org/
For information on Historic Preservation Programs:
http://www.uvm.edu/~vhnet/hpres/org/vdhp/vdhp1.html Note: This web site is out of date but contains some good basic information. A new site is under construction.

-----Original Message-----
From: Joseph Nelson [mailto:jcnelson@together.net]
Sent: Tuesday, June 04, 2002 1:54 PM
To: Eric Gilbertson
Cc: warren.tripp@state.vt.us; Nancy Boone
Subject: Lord's Creek Bridge

Dear Mr. Gilbertson:

Lord's Creek Bridge was named for the stream at its original site south of the village of Irasburg. Sometimes known as the Orne Bridge, it was built in 1881 by John D. Colton.

The bridge features the Paddleford truss, truss length 47' 9" overall length 57' 3". It is one of the last two surviving original Paddleford bridges in Vermont, the other being the Sanborn Bridge (1869) in Lyndon, next to Rt. 5. A third Paddleford bridge, the Black River, or Irasburg, or Lower Bridge was built in 1881 by John D. Colton and lost to arson in 1997.

The bridge was retired in the late 1950s and acquired by the LaBonds and moved over the Black River at the LaBond family farm.

I have attached two photos: one from "The Covered Bridge," H.W. Congdon, 1959, photo by E.M. Royce, the other from "Covered Bridge Ramblings," by C. Ernest Walker, 1959, photo by the author.

Lord's Creek Bridge is not the only Vermont Covered Bridge not on the National Register. It is one of 13 not listed:

CHISELVILLE (Sunderland) -East Arlington - Bridge floor replaced with self-supporting deck and mid-stream pier 1973
LORD'S CREEK (Irasburg)
MIDDLE (Woodstock) Union Street Bridge
MUSEUM (Shelburne) - Big Bridge while in Cambridge.
SALMOND (Weathersfield) - Removed from original site
SANBORN (Lyndon) - Center Bridge - Removed from original site
SCHOOL HOUSE (Lyndon Corner) - Removed from original site
SMITH (Pomfret) - Removed from original site
SPADE FARM (Charlotte) - Removed from original site
STOUGHTON (Weathersfield) -Titcomb Bridge. - Removed from original site
TWIN (Rutland) - Removed from original site
VICTORIAN VILLAGE (Rockingham) - Removed from original site
WESTFORD (Westford) -Browns River Bridge. - Removed from original site

Yours in bridging, Joe Nelson


"Orne"
Irasburg
VT

NR

VERMONT COVERED BRIDGES - 1973

County	Town	Name	Date	Truss	Owner
Addison	Cornwall - Salisbury	Cedar Swamp	1864-1865	Town	Towns
"	? Ferrisburg	debit find	c. 1850 ( )	Town	Private
"	Middlebury - Weybridge	Pulp Mill	c. 1820-1830	Burr	Towns
"	Middlebury	Halpin		Town	Town
"	Shoreham	Railroad	1897	Howe	D. of H.S.
Bennington	Arlington	Arlington Green	1852	Town	Town
"	Bennington	Henry	c. 1840	Town	Town
"	"	Bennington Falls	1889	Town	Town
"	"	Silk	c. 1840	Town	Town
"	? Sunderland	Chiselville - NOT LISTED ON INDEX	1870	Town	Town
Caledonia	Danville	Green Bank Hollow		Queenpost	Town
"	Lyndon	Bradley	1872	Queenpost	Town
"	"	Chamberlain		Queenpost	Town
"	"	? Schoolhouse NOT LISTED ON INDEX	1872	Queenpost	Town
"	"	Burrington	1872-1873	Paddleford	Private
"	"	Centre		Paddleford	Private
	St. Johnsbury	Fairbanks			

County	Town	Name	Date	Truss	Owner
Chittenden	Charlotte	Quinlan's ✓	1849	Burr	Town
"	"	Holme's Creek		Burr	Town
"	"	Sequin		Laminated arch	Town
"	Shelburne	Museum	1845 (1951)	Burr	Private
"	Westford – NONE LISTED ON INEX			Burr	Town
Franklin	Enosburg	Hopkins C.B.		Town	Town
"	Fairfax	Fairfax C.B.		Town	Town
"	Fairfield	E. Fairfield C.B.	c. 1865	Queenpost	Town
"	Montgomery	Comstocks	1883	Town	Town
"	"	Fuller	1890	Town	Town
"	"	Hectorville		Town	Town
"	"	Longley C.B.		Town	Town
"	"	Hutchins		Town	Town
"	"	West Hill		Town	Town
"	Swanton	Railroad	1898	Town-Pratt	
Lamoille	Belvidere	Mill ✓	c. 1890	Queenpost	Town
"	"	Morgan ✓	1887	Queenpost	Town
"	Cambridge	Gates Farm ✓	1897 (1950)	Burr	
"	"	Grist Mill ✓		Burr	Town
"	"	Poland ✓	1887	Burr	Town
"	Johnson	Power ~~Plant~~ ✓ House	1870	Queenpost	Town

County	Town	Name	Date	Truss	Owner
Lamoille	Johnson	Scribner		Queenpost	Town
"	"	Waterman	1868	Queenpost	Town
"	Morristown	Red	1896	Queenpost	Town
"	Stowe	Gold Brook	c. 1850	Howe	Town
"	Waterville	Jaynes	c. 1877	Queenpost	Town
"	"	Montgomery	c. 1877-1887	Queenpost	Town
"	"	Village	c. 1877	Queenpost	Town
"	Wolcott	Fisher	1908	Town-Pratt	D. of H.S.
Orange	Chelsea	Moxsley	1886-1887	Queenpost	Town
"	Randolph	Braley C.B.	1903-1904	Multiple Kingpost	Town
"	"	Gifford C.B.	1903-1904	Multiple Kingpost	Town
"	"	Kingsley C.B.	1903-1904	Multiple Kingpost	Town
"	Thetford	Thetford Center		Haupt	Town
"	"	Union Village		Multiple Kingpost	Town
"	Tunbridge	Cilley	1883	Multiple Kingpost	Town
"	"	Flint	1845	Queenpost	Town
"	"	Howe	1879	Multiple Kingpost	Town
"	"	Larkin	1902	Multiple Kingpost	Town
"	"	Mill	1883	Multiple Kingpost	Town
Orleans	Irasburg	Orne	1881	Paddleford	Town
"	? "	- NO OTHER LISTING	1881 (1958)	Paddleford	Private
"	Troy	River Road C.B.		Town	Town

County	Town	Name	Date	Truss	Owner
Rutland	Brandon	Dean ✓	c. 1840	Town	Town
"	"	Sanderson ✓	1838	Town	Town
"	Clarendon	Kingsley ✓	1870	Town	Town
"	Pittsford	Cooley ✓	1849	Town	Town
"	"	Depot ✓	c. 1840	Town	Town
"	"	Hammond ✓	1842	Town	D. of H.S.
"	Pittsford - Proctor	Gorham ✓	1841	Town	Towns
"	Shrewsbury	Brown ✓	1880	Town	Town
Washington	East Montpelier	Coburn ✓	1851	Queenpost	Town
"	Marshfield	Orton Martin Covered Bridge	1890	Queenpost	Private
"	Northfield	Slaughter House		Queenpost	Town
"	"	Lower Cox Brook C.B.		Queenpost	Town
"	"	Northfield Falls C.B.	1872	Queenpost	Town
"	"	Slaughterhouse C.B.	1872	Town	Town
"	"	Stony Brook C.B.	1899	Kingpost	Town
"	? Waitsfield NO LISTING	Upper Cox Brook C.B. Old Arch	1833	Burr	Town
"	"	Great Eddy C.B.	1872	Kingpost	Town
"	Warren	Pine Brook C.B. Warren Covered Bridge	1879-1880	Queenpost	Town
Windham	Brattleboro	Creamery ✓	1879	Town	Town
"	Dummerston	West Dummerston ✓	1872	Town	Town
"	Grafton	Kidder ✓	c. 1870	Queenpost	Town

County	Town	Name	Date	Truss	Owner
Windham	Guilford	Green River ✓	c. 1870	Town	Town
"	Newfane	Williamsville ✓	pre 1869	Town	Town
"	Rockingham	Bartonsville ✓	1871	Town	Town
"	"	Hall ✓	1867	Town	Town
"	"	Worrall ✓	1870	Town	Town
"	" — NO OTHER LISTING		(19)	Kingpost	Town
"	Townshend	Scott ✓	1870	Town-Kingpost	D. of H.S.
Windsor	Hartland	Martin's Mill ✓	c. 1880	Town	Town
"	"	Willard ✓		Town	Town
"	? Springfield	Baltimore - NO LISTING	1870 (19)	Town	D. of H.S.
"	? Weathersfield	Stoughton's - NO LISTING	(19)	Multiple Kingpost	Private
"	"	Upper Falls ✓		Town	Town
"	West Windsor	Best's ✓		Laminated arch	Town
"	"	Bowers ✓		Laminated arch	Town
"	Woodstock	Lincoln ✓	1877	Pratt	Town
"	"	Taftsville ✓	1836	Queenpost-arch	Town
"	? "	Middle NO LISTING	1969	Town	Town

CONNECTICUT RIVER (N.H.) COVERED BRIDGES

Essex	Lemington	Columbia	1912	Howe
"	Lunenburg	Mount Orne	1911	Howe
Orange	Newbury	Bedell	1866	Burr
Windsor	Windsor	Cornish	1866	Town

VERMONT COVERED BRIDGES - 1973

County	Town	Name	Date	Truss	Owner
Addison	Cornwall - Salisbury	Cedar Swamp	1864-1865	Town	Towns
"	Ferrisburg	Old Ford	c. 1850 ( )	Town	Private
"	Middlebury - Weybridge	Pulp Mill	c. 1820-1830	Burr	Towns
"	Middlebury	Halpin		Town	Town
"	Shoreham	Railroad	1897	Howe	D. of H.S.
Bennington	Arlington	Arlington Green	1852	Town	Town
"	Bennington	Henry	c. 1840	Town	Town
"	"	Bennington Falls	1889	Town	Town
"	"	Silk	c. 1840	Town	Town
"	Sunderland	Chiselville NOT LISTED ON INDEX	1870	Town	Town
Caledonia	Danville	Green Bank Hollow		Queenpost	Town
"	Lyndon	Bradley	1872	Queenpost	Town
"	"	Chamberlain		Queenpost	Town
"	"	Schoolhouse NOT LISTED ON INDEX	1872	Queenpost	Town
"	"		1872-1873	Paddleford	Private
"	"			Paddleford	Private

County	Town	Name	Date	Truss	Owner
Chittenden	Charlotte	Quinlan's	1849	Burr	Town
"	"	Holmes Creek		Burr	Town
"	"	[illegible]		Laminated arch	Town
"	Shelburne	Museum	1845 (1951)	Burr	Private
"	Westford -	NONE [illegible]		Burr	Town
Franklin	Enosburg	Hopkins C.B.		Town	Town
"	Fairfax	Fairfax C.B.		Town	Town
"	Fairfield	Fairfield C.B.	c. 1865	Queenpost	Town
"	Montgomery	Comstocks	1883	Town	Town
"	"	Fuller	1890	Town	Town
"	"	Hectorville		Town	Town
"	"	Longley C.B.		Town	Town
"	"	Hutchins		Town	Town
"	"	West Hill		Town	Town
"	Swanton	Railroad	1898	Town-Pratt	
Lamoille	Belvidere	Mill	c. 1890	Queenpost	Town
"	"	Morgan	1887	Queenpost	Town
"	Cambridge	Gates [illegible]	1897 (1950)	Burr	
"	"	Grist Mill		Burr	Town
"	"	Poland	1887	Burr	Town
"	Johnson	Power Plant	1870	Queenpost	Town

County	Town	Name	Date	Truss	Owner
Lamoille	Johnson	Scribner		Queenpost	Town
"	"	Waterman	1868	Queenpost	Town
"	Morristown	Red	1896	Queenpost	Town
"	Stowe	Gold Brook	c. 1850	Howe	Town
"	Waterville	Jaynes	c. 1877	Queenpost	Town
"	"	Montgomery	c. 1877-1887	Queenpost	Town
"	"	Village	c. 1877	Queenpost	Town
"	Wolcott	Fisher	1908	Town-Pratt	D. of H.S.
Orange	Chelsea	Moxsley	1886-1887	Queenpost	Town
"	Randolph		1903-1904	Multiple Kingpost	Town
"	"		1903-1904	Multiple Kingpost	Town
"	"		1903-1904	Multiple Kingpost	Town
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"	"	Union Village		Multiple Kingpost	Town
"	Tunbridge	Cilley	1883	Multiple Kingpost	Town
"	"	Flint	1845	Queenpost	Town
"	"	Howe	1879	Multiple Kingpost	Town
"	"	Larkin	1902	Multiple Kingpost	Town
"	"	Mill	1883	Multiple Kingpost	Town
Orleans	Irasburg	Orne	1881	Paddleford	Town
"	"		1881 (1958)	Paddleford	Private
"	Troy			Town	Town

County	Town	Name	Date	Truss	Owner
Rutland	Brandon	Dean	c. 1840	Town	Town
"	"	Sanderson	1838	Town	Town
"	Clarendon	Kingsley	1870	Town	Town
"	Pittsford	Cooley	1849	Town	Town
"	"	Depot	c. 1840	Town	Town
"	"	Hammond	1842	Town	D. of H.S.
"	Pittsford - Proctor	Gorham	1841	Town	Towns
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Washington	East Montpelier	Coburn	1851	Queenpost	Town
"	Marshfield	Orton	1890	Queenpost	Private
"	Northfield	Slaughter House		Queenpost	Town
"	"	Lower Cox Brook C.B.		Queenpost	Town
"	"	Slaughter House C.B.	1872	Queenpost	Town
"	"	Colony Brook C.B.	1872	Town	Town
"	"	Upper Cox Brook C.B.	1899	Kingpost	Town
"	Waitsfield	Old Arch	1833	Burr	Town
"	"	Great Eddy C.B. Pine Brook C.B.	1872	Kingpost	Town
"	Warren	Warren Covered Bridge	1879-1880	Queenpost	Town
Windham	Brattleboro	Creamery	1879	Town	Town
"	Dummerston	West Dummerston	1872	Town	Town
"	Grafton	Kidder	c. 1870	Queenpost	Town

County	Town	Name	Date	Truss	Owner
Windham	Guilford	Green River	c. 1870	Town	Town
"	Newfane	Williamsville	pre 1869	Town	Town
"	Rockingham	Bartonsville	1871	Town	Town
"	"	Hall	1867	Town	Town
"	"	Worrall	1870	Town	Town
"	" - NO OTHER LISTING		(19)	Kingpost	Town
"	Townshend	Scott	1870	Town-Kingpost	D. of H.S.
Windsor	Hartland	Martin's Mill	c. 1880	Town	Town
"	"	Willard		Town	Town
"	Springfield	Baltimore NO LISTING	1870 (19)	Town	D. of H.S.
"	Weathersfield	Stoughton's NO LISTING	(19)	Multiple Kingpost	Private
"	"	Upper Falls		Town	Town
"	West Windsor	Best's		Laminated arch	Town
"	"	Bowers		Laminated arch	Town
"	Woodstock	Lincoln	1877	Pratt	Town
"	"	Taftsville	1836	Queenpost-arch	Town
"	"	Middle NO LISTING	1969	Town	Town

CONNECTICUT RIVER (N.H.) COVERED BRIDGES

Essex	Lemington	Columbia	1912	Howe
"	Lunenburg	Mount Orne	1911	Howe
Orange	Newbury	Bedell	1866	Burr
Windsor	Windsor	Cornish	1866	Town

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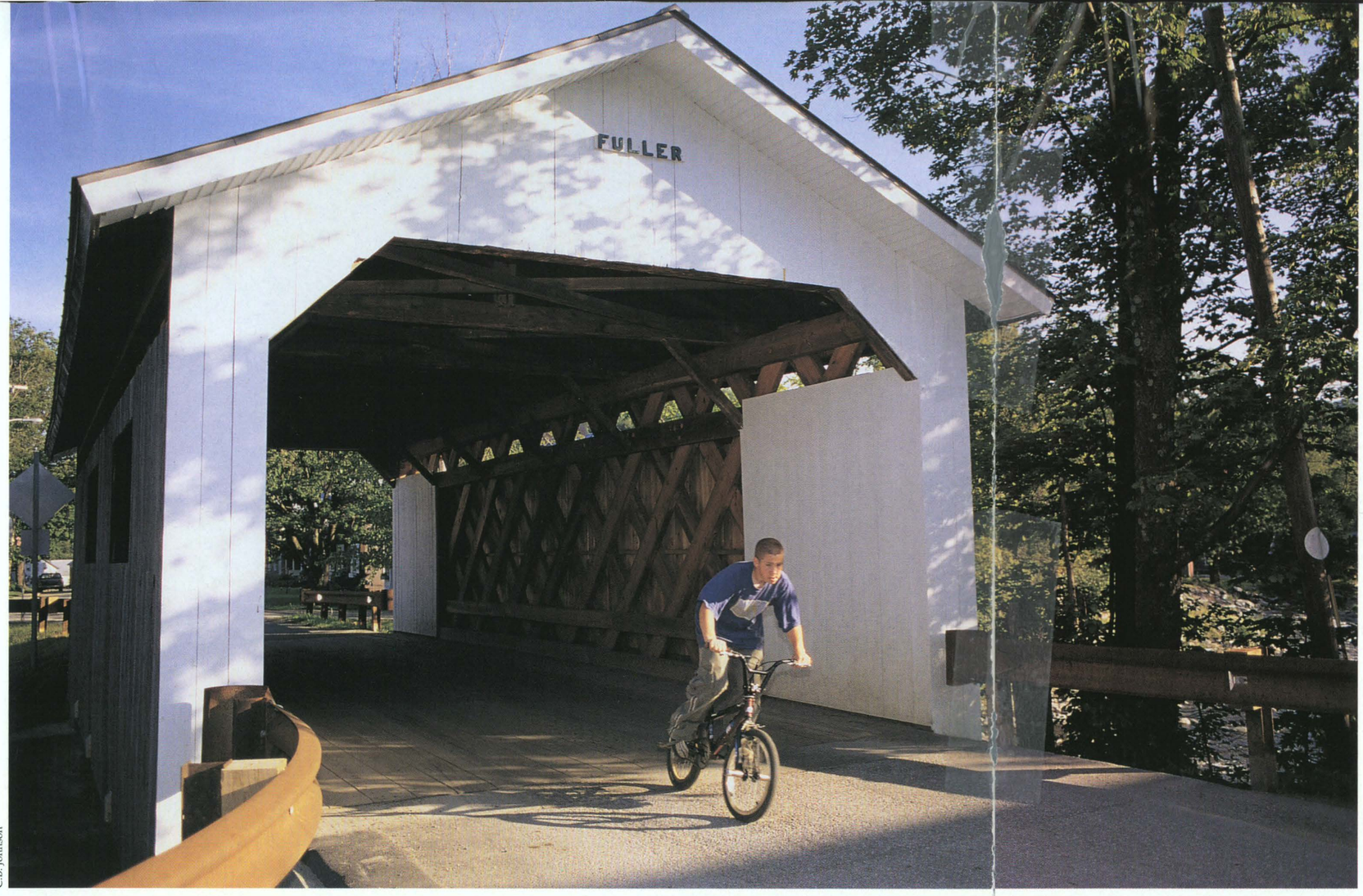


C.B. Johnson

Montgomery's Fuller covered bridge, left, was rebuilt in 2000, a job that exemplified the challenges and rewards of maintaining these historic structures. The Fuller Bridge, like most of Vermont's covered bridges, uses the trellis-like Town lattice truss, below.

Covered Bridge Comeback

By Joe Sherman

The twentieth century was tough on covered bridges. In the United States they once numbered more than 10,000 and were found in 40 states. But progress, arson, neglect and floods took their toll. In Vermont, the Flood of 1927 alone swept more than 200 of 500 bridges into oblivion, including two at one blow on the Passumpsic River in St. Johnsbury, where the Hastings Street Bridge battered the Arlington Bridge and both went over a waterfall. By the mid-1940s Vermont had 170 covered bridges, by the early 1980s only 114. But then, as the remaining bridges seemed endangered, Vermonters realized they were losing something precious and irreplaceable. These architectural icons, which had made many engineers grimace and town road commissioners roll their eyes, began being rehabilitated and, in some cases, totally rebuilt. Nostalgic symbols of a disappearing rural landscape, the bridges were tough and still did an admirable job carrying vehicles and pedestrians across brooks and rivers.

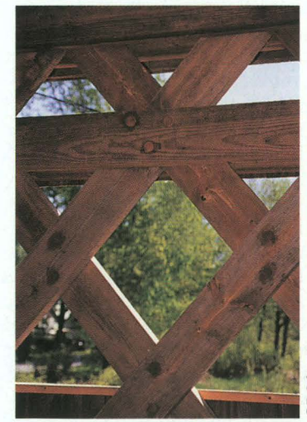
Today, 110 survive in Vermont and approximately 800 across the United States. Most of Vermont's bridges are on the National Register of Historic Places. They have been individually assessed and command diligent attention from state agencies, ad-hoc groups and organized covered-bridge fans.

One of them, the Fuller Bridge, crosses Black Falls Brook about 100 yards upstream from my house in Montgomery. Its predecessor, built in 1890 by the Jewett brothers, was a replacement for a bridge that collapsed beneath the weight of a four-horse team hauling a wagon back in an era when Montgomery was the buttertub-making capital of the world. Throughout the first half of the 20th century the Fuller Bridge was memorialized in poetry, photographed for books, functioned as a bulletin board for ads for shoes, circuses and corsets, as well as for Kendall's Spavin Cure from nearby Enosburg Falls ("Cures spavins, ringbones, splints without blistering or causing any sores. TRY IT"). During the second half of the century the bridge endured its share of indignities. These included cement trucks overloading its timbers, a logging truck zipping through with its cherry picker too high and clipping the crossties, dropping the roof in a neat, upside-down V on the plank floor. Meanwhile, with a new roof in place, hardwood-loving powder-post beetles took up residence in some of the pegs, gradually compromising structural integrity. Then in 1997 a flash flood practically tore the bridge from its footings. It survived — a nearby steel-and-concrete cousin did not — but was crippled. A steel I-beam was cabled to the floor as a crutch. Ironically, the flood made the bridge eligible for money from FEMA, the Federal Emergency Management Agency. Already earmarked for repairs by the state, in May 2000 the bridge was lifted off its footings and joined the covered bridge revival.

Here was proof of the revival's momentum. The Fuller Bridge is generic. At 50 feet, it wins no size prizes. Although it may fit in the "kissing bridge" category, meaning that couples once passing through took certain amorous liberties, it never had a guillotine toll gate that dropped in front of horse and buggies to make sure the driver paid, nor did a famous politician deliver a speech in its shade or some movie director dress it up with starlets and villains for a melodramatic scene. The Fuller Bridge's claim to fame was simply that it survived a century when thousands of bridges just like it didn't.

But it had problems.

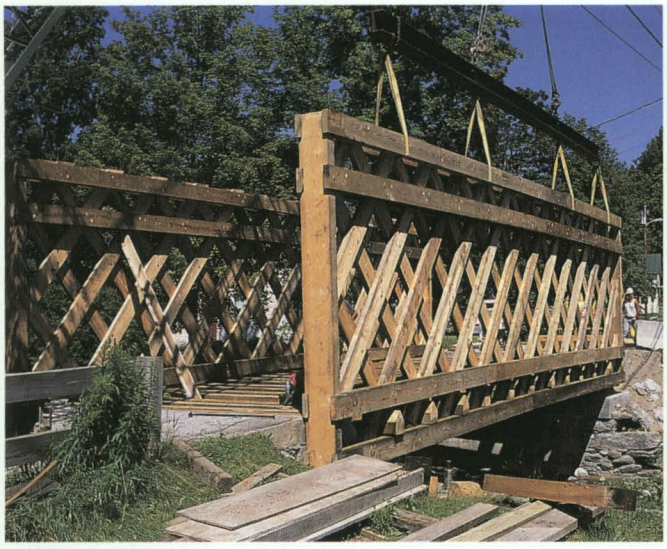
"The upstream truss was shot," Marc Cote, president of Blow and Cote Inc., the general contractor, explained, once the bridge lay in pieces alongside the brook. "It was no longer symmetrical. That threw everything off." He gestured to the roof, on cribs nearby. "That's all we could reuse."

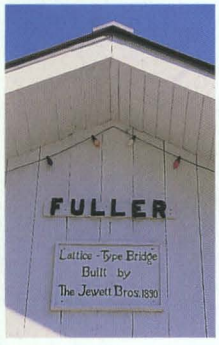


C.B. Johnson

The decision was made to rebuild the bridge rather than to repair it.

Originally budgeted at $185,000 for repairs, the rebuild cost $280,000.





C.B. Johnson

"We take pride in knowing that loaded gravel trucks are using the bridge. We built this bridge with our strength and send it forward in time with the hope that it will come to be as precious to the generations that will use it as its predecessor was to generations gone by."

— Roland Blais,
member of the crew that rebuilt the Fuller Bridge, in a letter to the Vermont Covered Bridge Society's newsletter.

FEMA paid $40,000, the Town of Montgomery $24,000, and the Vermont Agency of Transportation the rest.

Cote's company got the job because it was the low bidder and had rebuilt two similar bridges, the 120-foot Henry Bridge and the 125-foot Papermill Bridge, both on the Walloomsac River in Bennington. Like the Fuller Bridge and the other covered bridges built in Montgomery by the Jewett brothers, they were Town lattice truss designs. Also known as the plank-lattice truss because it uses planks rather than timbers, the design was patented by a New Haven, Connecticut, architect named Ithiel Town in 1820. Not a bridge builder himself, Town sold his design through agents for a royalty of one dollar per foot. It was popular because it was easy to fabricate. "It was once said the Town plank-lattice truss could be built by the mile and sawed off to suit the site," Joseph Nelson writes in *Spanning Time: Vermont's Covered Bridges*. Regular carpenters could then erect the finished product.

In modern Vermont, the Fuller Bridge is the shortest Town lattice truss design handling regular traffic; the longest is the 267-foot West Dummerston Bridge. The majority of Vermont's remaining covered bridges are of this design, and the 460-foot Windsor-Cornish Bridge spanning the Connecticut River from Cornish, New Hampshire, to Windsor, Vermont, is too. The bridge, owned by New Hampshire, is the longest covered bridge in the United States.

The lattice truss can be traced back to Andrea Palladio, the 16th-century Italian architect most noted for his villas. A New England builder named Theodore Burr adapted some of Palladio's structural concepts for bridges around 1800. The Burr kingpost truss combined an arch with a primitive truss and was good for short spans. Ithiel Town's design, with its ease of construction and strength, dominated the covered bridge-building scene in the mid-1800s.

A Town lattice truss can be easily distinguished from, say, a Burr kingpost truss or a Paddleford truss, because it closely resembles a huge garden trellis. Standing alone it would be ideal for climbing vines. A lattice truss is made of planks pegged together where they crisscross, then pegged again at the top and bottom into the chords, the main horizontal planks. The resulting structure, a series of triangles, is immensely strong and stable. It distributes weight evenly and seldom fails. If it does, watch out.

Eric Gilbertson, deputy state historic preservation officer, recalls when a Town lattice-truss bridge literally exploded. A truck driver, hearing groaning wood, made the mistake of stopping on the bridge, leaping out and running. He should have kept going. Had he, the bridge probably would have held. "There were pieces scattered from hell to breakfast," said Gilbertson.

Although the Fuller Bridge lacked that kind of drama, it did have a certain mystery to it, according to Marc Cote. "We think the Jewett brothers used up all their pieces on other bridges in town," he said. "Then they came here and did this one with the leftovers."

Cote could be right.

There were eight Jewett brothers. They lived in the upland valley of Montgomery called West Hill and were led by Savanard and Sheldon Jewett. Relying on water power from West Hill Brook, which turned the saws in one brother's sawmill and powered another

The Fuller bridge is rebuilt, from left: the upstream lattice truss is installed; the floor goes in; the roof is re-installed.
Photos by Joseph C. Nelson

brother's small shake factory, the Jewetts built bridges from 1863 to 1890. Since the Fuller Bridge was the last, it may very well have been an amalgamation of lumber and trusses from other sites. Still, as Marc Cote thought the possibility over, he voiced doubts.

"Maybe they had good reason for varying the trusses," he said. "Maybe they did it that way on purpose. You know, everybody had their own system back then."

That is no longer true.

A completed covered bridge project nowadays may look like a historic bridge, but the process it has to go through is narrowly defined. When a town seeks state funding to repair a covered bridge, the Agency of Transportation inspects the bridge and reports to the state's Historic Covered Bridge Committee on its condition and the traffic it handles. Using the state preservation plan for covered bridges as their guide, the committee, formed in 2000 and made up of historic preservationists, engineers from the transportation agency and representatives of the Vermont Division for Historic Preservation, discusses options that would best preserve the bridge, its historic materials and design. Sometimes preservation is as simple as replacing timber or adding new materials to support or strengthen the bridge.

"Our goal is to keep as much historic material in the bridge as possible," said Nancy Boone, state architectural historian in the historic preservation division.

Once the committee makes a decision on what's to be done, the transportation agency finalizes the plans and puts the project out to bid.

Watching all this with interest is the National Society for the Preservation of Covered Bridges and the Vermont Covered Bridge Society, which has a representative on the covered bridge committee. In the case of the Fuller Bridge, the decision was to build a replica, and neither group was happy about how the project, initially a rehabilitation, evolved into a complete reconstruction.

"There is a lot of hard feeling about what happened to that bridge," said Joe Nelson, president of the Vermont Covered Bridge Society, which boasts 142 members coast-to-coast and has its own Web site (see box, right). His group often prefers that if a bridge can't be restored to full use by replacing damaged timbers with similar wood assembled using the methods of the original builders, it should be bypassed and used for pedestrians or preserved as a historic site.

Authorities and covered bridge watchdogs aside, Marc Cote said he managed to pick up a few construction secrets. "Every time we work on one of these," he said, "we learn a new trick."

"What was it on this one?" I asked.

A lanky, wry-humored guy, Cote stared at me like I was a peg with beetle rot. "It's a trade secret," he said. Then he grinned slightly. "Something to do with camber."

Part and parcel of the strength of each truss is camber, a slight upward curvature built into the chords. Ironically, it's the vital camber that creates the optical illusion that a covered bridge is straight. An absolutely straight bridge would appear to sag.

Cote sketched a picture to show me how chords with camber work. As a heavy weight passes through the bridge, the camber flexes down slightly, evenly distributing the load across the X's of the truss. The weight exits, and the camber springs back into its curvature, awaiting the next vehicle.

(Continued on page 69)

Covered Bridge Links

For more on reconstruction of the Fuller Bridge, including more photos, and for other covered bridge information, go to the **Vermont Covered Bridge Society**'s Web site: www.vermontbridges.com/vcbs.htm. The society publishes a newsletter, conducts tours and works with local groups on bridge preservation and maintenance. Society information, updates on Vermont bridges, links to covered bridge Web sites and copies of recent newsletters are at the society's Web site, or call (802) 899-2093 or write VCBS, P.O. Box 267, Jericho, VT 05465.

The **National Society for the Preservation of Covered Bridges** can be reached at P.O. Box 910, Westminster, VT 05158. Its newsletters can be seen at www.vermontbridges.com/nspcb1st.htm.

Montgomery's Jewett brothers and crew at work on the Comstock Bridge over the Trout River in 1883.

Montgomery Historical Society

BRIDGES
(Continued from page 37)

A big difference between historic bridges and those built today is the wood. Traditionally, Vermont bridge builders like the Jewett brothers used hemlock and spruce, cut and sawn locally. Today, rebuilders use mostly Southern yellow pine hauled north by trailer. It's tough wood, roughly twice as strong as today's hemlock, which is a far cry from what could still be found in Vermont forests in the 19th century. Old growth spruce and hemlock, with their densely ringed heartwood, made good trusses and chords. Today's faster-growing trees have neither the density nor the strength of those the Jewetts hauled by horse to their sawmill.

Of course, the Jewett brothers didn't have to think about 18 wheelers or school buses either. Pressured on one side by safety issues and on the other by issues of authenticity, engineers and others responsible for the final decisions about our covered bridges have compromised to fulfill the complex task of looking historic and avoiding lawsuits. Bottom line? No one wants to see a covered bridge explode beneath a cement truck, splintered trusses in the river and lawyers on the banks.

The Jewett brothers worked in a vastly different era. Deals were often sealed with a handshake. There was no electricity. A photo at the Montgomery Historical Society shows the brothers in action in 1883 (see page 37). They have both trusses of the Comstock Bridge in place, supported by temporary timbers rammed into the bottom of the river. Eight very still men face the camera, several balanced on horizontal beams. The roof and its shakes, the floor planks and the siding all will come later. Angled braces, called falsework, hold the trusses in place. They were probably fabricated on site, cut and drilled with hand augers, the pegs driven home with mauls. Recalling the photo, I wonder if any of the Jewett brothers ever sent Ithiel Town a royalty check.

A century later, the crew working on the Fuller Bridge pegs its trusses with a jackhammer after making the holes with a large power drill. One link with the past is the fit of the pegs, also called treenails and pronounced "trunnels." Jan Lewandowski, who recently

repaired one of Montgomery's other covered bridges, says, "The pinning of the lattice truss is very important." If a peg is too big, it may crack the joint. Too small, the joint is weak.

Gilbert Newbury, who repaired the Silk Bridge in Bennington, says this about his preference for traditional pegging: "Greased with beeswax, it takes about 20 blows with a sledgehammer to get [each peg] in, but once they are in, moisture transfer locks them in place. It's another example of where the old method works very well."

On the Fuller Bridge, once the trusses were built, the downstream one was loaded on a trailer, driven alongside the embankment, and lifted into place with a crane. The floor timbers, the tough Southern yellow pine, were lowered by crane, their upstream butts resting on a temporary steel I-beam. The upstream truss followed. Like the Jewett brothers, Cote's crew used falsework to hold the pieces in place until pegs adequately tied them together.

A layer of treated two-by-fours and oak decking finished the floor. Finally came the siding and a standing-seam roof painted slate gray.

The Fuller Bridge now looked great and started handling traffic, but the best that could be said for four of the town's six surviving bridges was that they endured, awaiting the attention shown their timbered cousins elsewhere. The Creamery Bridge, located by the former settlement of West Hill, where the Jewett brothers lived and worked, was closed and had holes in its floor and sides. The Hectorville Bridge, which sets alongside its steel-and-concrete replacement, had a jury-rigged kingpost truss keeping it out of a ravine. The Hutchins Bridge, which once graced the frontispiece for *The Covered Bridge*, published in 1941, also needed considerable repair. The Comstock Bridge, located in Montgomery Village, was scheduled for repairs in 2002. And the Longley Bridge had been renovated.

The state of Montgomery's bridges was not unusual, said Nancy Boone. "Today most people recognize their value. At the same time they rarely see how vulnerable and fragile they are. They presume the town must be taking care of them. That's not always true."

"The historic preservation people want them fixed, but the town doesn't have the money," said Billy Baker, the town road commissioner.

"Stabilization, patching a hole in a roof, costs very little and does a lot to prevent deterioration," countered Nancy Boone. A mothballed bridge stops deteriorating until funding can be found.

Probably the one person with the most clout working on the funding issue was Vermont U.S. Senator James Jeffords. In the mid-1990s, his covered bridge awareness quotient had been bumped up by Ed Barna, author of *Covered Bridges of Vermont*. Barna's efforts seeded Jeffords's growing concern, which resulted in passage of the Covered Bridges Preservation Act of 1998. Since then the act has allocated $18 million for covered bridges nationwide. In late 2000, bridges in Cambridge and Thetford received $1 million apiece, although debates continued about how to repair the bridges.

Meanwhile, a covered bridge museum is scheduled to open late this summer at the Bennington Center for the Arts (802-442-7158).

And the Fuller Bridge replica is serving cars, trucks and pedestrians again, all with little fanfare. People here seemed happy with it, though maybe not quite as happy as Roland Blais, who spent all summer and fall working on it for Blow and Cote.

The day I found Blais doing touch-up work, rounding the edges of the flooring with a chain saw to give drivers a smoother ride entering and exiting, he took a break and walked me down the loose stones to Black Falls Brook. After pointing out a few details, including little wooden blocks that would cover the yet-to-be-installed turnbuckles, he pointed at the upstream side of the bridge. It was the original siding weathered to a feathery gray.

"We combined the old wood from both sides of the old bridge," Blais said, sounding pleased. "We're paying tribute to the people who built this bridge in the old days. We think it looks pretty good. I can stare at it all day."

Joe Sherman's latest book is the update of his Fast Lane on a Dirt Road: A Contemporary History of Vermont *(Chelsea Green Press, White River Junction).*

VTRANS AND UVM NCPTT GRANT PROPOSAL - FY2000
PAGE ONE: COVER SHEET

1. **PROJECT TYPE:** 3 – Applied / Fundamental Research

2. **PROJECT TITLE:** Historic Covered Bridge Research Project – Calculation of Load Distribution for Deck and Floor Beam Design.

3. **APPLICANTS:** This is a collaborative proposal submitted by the Vermont Agency of Transportation (VAOT) and the University of Vermont (UVM). VAOT is represented by its Structures Division and by its Vermont Historic Bridge Program. The University of Vermont is represented by its Department of Civil and Environmental Engineering and by its Graduate Program in Historic Preservation.

   (a) **Applicants' Data:**

   Vermont Agency of Transportation
   Administration Building
   Montpelier, Vermont 05633-5001

   Structures Division. Participant: Warren Tripp, P.E., Structures Engineer. Phone: 802-828-2621. Facsimile: 802-828-3566. E-mail: Warren.Tripp.state.vt.us.
   Vermont Historic Bridge Program. Participants: Susan Scribner and Robert McCullough, Co-Managers. Phone: 802-828-3615. Facsimile: 802-828-5712. E-mail: Sue.Scribner.state.vt.us and Bob.McCullough.state.vt.us.

   University of Vermont
   Department of Civil and Environmental and Engineering (UVMCEE)
   213 Votey Building

   Graduate Program in Historic Preservation (UVMHP)
   Wheeler House / 442 Main Street
   Burlington, Vermont 05405-0164

   Participants: John-Guy Beliveau, P.E. (UVMCEE). Phone: 802-656-1931. Facsimilie: 802-656-8446. E-mail: beliveau@emba.uvm.edu. Robert McCullough (UVMHP). Phone: 802-656-9773. Facsimilie: 802-656-8794. E-mail: rmccullo@zoo.uvm.edu.

   (b) **Principal Project Contact:** Robert McCullough, Graduate Program in Historic Preservation (UVMHP).
   (c) **Authorized Signatory for Grant Agreement:** Regina White, Director of Office of Sponsored Programs (UVM)
   (d) **Principal Investigator:** Jean-Guy Beliveau, P.E. (UVMCEE)

4. **URL/WEB SITE:** Vermont Agency of Transportation: www.aot.state.vt.us. The University of Vermont Graduate Program in Historic Preservation: www.uvm.edu/~histpres/uvmhp.html.

5. **PROJECT TEAM:** Warren Tripp, Susan Scribner, Robert McCullough, Jean-Guy Beliveau, Brian Esser (Laboratory Technician, UVMCEE), and Jan Lewandowski, contractor–consultant.

6. **NCPTT FUNDING REQUESTED:** $40,000

7. **ABSTRACT:** Specifically, the project will develop load distribution factors for deck and floor beam systems on historic covered bridges through actual full-scale testing. A typical floor system will be designed, constructed and tested at UVMCEE's laboratory. Results will enable engineers to apply appropriate live loading to both deck and floor beam design. Broadly, the project will strengthen VAOT's innovative Vermont Historic Bridge Program, which is developing a preservation plan for the state's covered bridges. That plan seeks to use these bridges on roads but also to preserve their historic structural integrity to the maximum extent possible. This research project is a crucial step toward that goal. VAOT's Structures Division has prepared a problem statement and will collaborate with UVMCEE. Students from UVMCEE and UVMHP will participate or observe. Transportation, bridge engineering, and historic preservation (and their respective educational programs) all will benefit.

8. **SIGNATURE:** Regina H. White DATE: DEC 17 1999

Regina H. White, Director
Office of Sponsored Programs

VTRANS AND UVM NCPTT GRANT PROPOSAL – FY2000
PROJECT DESCRIPTION

1. **PROJECT TYPE:** 3 - Applied / Fundamental Research

2. **PROJECT TITLE:** Historic Covered Bridge Research Project – Calculation of Load Distribution for Deck and Floor Beam Design.

3. **PROJECT NARRATIVE:**

(a) **Previously Published Work.**

No work on this precise topic has been published. Brian J. McKee's Historic Covered Bridges of America (Oxford Univ. Press, 1997) is a recent book of general scope.

(b) **Research Approach.**

Problem Statement (Prepared by Warren Tripp). The analysis of existing covered bridges is an inexact and difficult process. The interaction of various components is not well understood, which seems to result in conservative analysis. This conservative approach requires that members be larger and/or more closely spaced than necessary. The net result is excess timber, which may add significantly to the structure dead load with a corresponding decrease in live load capacity. Engineering analysis of covered bridges is not supported by evidence of loads that are currently being carried by these bridges.

The historic structural integrity of covered bridges is often compromised as well. Unnecessary replacement of original or existing materials, alterations that force changes to overall bridge dimensions, and reinforcements that discourage maintenance of original structural systems are all consequences of poor understanding about the capacity of timber bridges. Added costs to the public are also an unnecessary result.

One of the more difficult areas of design is the transverse floor beam-longitudinal deck system used on many covered bridges. Typically floor beams in the range of 8" by 14" are spaced approximately three feet from timber-center to timber-center and support a 2" by 6" nail-laminated deck. The floor beams are supported on the bottom chord of the main trusses. The interaction of the deck and floor beams under live load is not well understood, which may mean that the live load distribution among floor beams may be greater than present codes assume.

This research project will build a partial deck and floor system of a typical covered bridge and conduct laboratory testing to accurately assess loading capacity.

(c) Work Plan – Project Objectives – Project Schedule

Project Objectives (Prepared by Warren Tripp and Jean-Guy Beliveau). The objective of this research is to develop load distribution factors through actual full scale testing that will enable a designer to apply the appropriate live loading to both the deck and floor beam design. It is anticipated that the research will encompass at least the following tasks:

(1) Review relevant design codes and other data to document current practice. The current practice of determining the capacity of a typical floor system used in covered bridges will be reviewed, including design codes and assumptions regarding timber behavior.

(2) Design a typical floor system. The strong floor in the Structures Laboratory at the University of Vermont can accommodate a full-scale floor system to a width of 14' and a length of 26'. It last was used to apply 100 kips in compression to a 14 foot long 110# rail in a study aimed at using modal data to determine the axial load in the rail, which had lateral stiffness simulating the ballast and ties every 21" along its length. There are loading points every 4' along the span consisting of two steel circular sections spaced 4' apart. Jacks will be used to apply loads at these loading points and deflections will be measured at these points and at the chord supports on both sides of the bridge deck.

Although the strong floor is only 7' by 31' long, steel beams will be used to extend the width to 14' at the four chord supports. The deck is limited to a length of 26' rather than the 31' of the strong floor because of the location of the 300 kip materials testing machine used to test concrete cylinders, which falls within the 14' width requirement.

(3) Construct and physically test a full size segment of floor system. First a static test using hydraulic jacks will be performed on a floor system at every four feet, and deflections throughout the bridge will be measured and compared to those of structural models using differing material parameters and assumptions of load distribution. There will be three 9' sections with four cross-beams and lower chord members supporting the crossbeams. The floor will consist of 2"x 6" verticals resting on the crossbeams cut at alternating crossbeams. The timbers for the deck, floor beams, and lower chord members will be obtained from an actual covered bridge once located in Dummerston, Vermont. That bridge was dismantled and rebuilt with new materials.

A number of specimens from the Dummerston bridge will also be tested for flexure and compression to determine their material properties and their range of limits, in particular the modulus of elasticity and the rupture modulus. A few members also will be tested in compression and tension to determine these corresponding parameters. These tests will be done on the 200 kip Olsen machine

capable of testing bending members up to 16' in length and members loaded axially up to 10' long. The moisture content of the specimen will also be determined to more accurately ascertain the mechanical properties as compared to published results for the species of wood of the structural members.

The same deck tested statically will then be tested dynamically using an impact hammer and accelerometers to determine the resonant frequencies and mode shapes of vibration of the deck. These mode shapes and resonant frequencies will be compared to those calculated using the structural models used to compare the static deflection. This dynamic testing would afford a non-destructive way of assessing existing covered bridges. The static and dynamic test will be done at a number of load levels to confirm the material behavior.

(*4*) ***Prepare a final report.*** This report will document the test results and provide recommendations regarding live load distribution factors for typical flooring systems used in covered bridges. Further, should the model testing performed in the laboratory be successful in assessing how loads are distributed in such a flooring system, a subsequent proposal will be submitted to test full-scale covered bridges in the field.

Project Schedule: The work will be completed between July 15, 2000 – July 14, 2001. Acquisition of the structural members and design of the floor system will be performed during the fall of 2000 in collaboration with engineers from VAOT. Timber from the Dummerston bridge has been reserved for this use. Materials testing and moisture content testing will be completed once the timber has been moved to the UVMCEE laboratory. Fabrication of the deck is planned for the spring of 2001, and it will take place either in the laboratory or at another site before moving it to the laboratory. Testing will be performed during the summer of 2001 in the UVMCEE's laboratory. The final report will present the results of the experiments and make recommendations regarding the assessment of covered bridge floor systems

(d) **Necessity and Benefits**

Context (Prepared by Robert McCullough). The Vermont Historic Bridge Program (the program) was established in 1998 by agreement of the Federal Highway Administration, the Vermont Agency of Transportation, the Vermont State Historic Preservation Office, the Vermont Agency of Natural Resources, and the Advisory Council on Historic Preservation. The program is administered by the Vermont Agency of Transportation and is managed by two employees, Susan Scribner and Robert McCullough, who share a single full time position. Ms. Scribner is the principal manager. Mr. McCullough is also a full time faculty member of the University of Vermont's Graduate Program in Historic Preservation.

More than ninety per cent of Vermont's historic bridges are owned by towns, making the application of consistent preservation practices quite difficult.

In response, the state legislature has offered financial incentives to towns that agree to enroll their bridges in the program. To qualify for enrollment, bridges must be identified in an historic bridge preservation plan, and plans are developed according to bridge type. An award-winning plan for the state's metal truss bridges has been completed and is now being implemented. A plan for the state's covered bridges is underway.

Vermont's covered bridges are widely recognized as valuable resources and are seldom threatened by proposals for replacement. Instead, a more subtle peril has emerged. Preservationists' good intentions notwithstanding, the historic structural integrity of these bridges is being compromised by conservative engineering analysis of carrying capacity. New materials are introduced, often of larger dimensions, which in turn cause an increase in the overall dimensions of bridges. Modern materials such as glu-laminated beams are becoming standard treatments. Supplemental (and often incompatible) structural systems are sometimes added as well, forcing redundancy of the historic structural elements and hastening their decline from lack of maintenance.

These are the trends, and the historic integrity of Vermont's covered bridges is at risk. Fifty years in the future we must be able to say that Vermont's collection of covered bridges is, in truth, a collection of historic bridges, not a collection of covered bridges that were largely rebuilt as new bridges at the close of the 20th century.

To address these complex issues, the program has embarked on a well-defined planning strategy to preserve the state's covered bridges. A special committee has been created, the Historic Covered Bridge Committee, and its members represent the Vermont Division for Historic Preservation and the Vermont Agency of Transportation, its Structures Division, Technical Services Division, and Historic Bridge Program. From time to time, members from other organizations, towns, or government agencies will be encouraged to participate as well.

The committee will review the status of all covered bridges and place bridges into appropriate categories of use, defined according to priority by a document titled "Historic Covered Bridges – Priority of Uses" (copy attached as Appendix A, currently in draft form). Once placed in a specific category of use, bridges will be restored or rehabilitated using only those preservation treatments applicable to that category. These preservation treatments are also defined according to priority by a document titled "Historic Covered Bridges – Priority of Treatments" (copy attached as Appendix B, currently in draft form). Decisions by the committee will then represent the preservation plan for Vermont's covered bridges, and this plan shall be implemented and enforced according to the requirements of the Vermont Historic Bridge Program.

Necessity. The committee has begun evaluating individual bridges, and its members immediately recognized the need to obtain better understanding about the interaction of deck and floor beams under live load. If the live load distribution among floor beams is greater than present codes assume, which is the hypothesis of this research proposal, our ability to preserve the historic structural integrity of Vermont's covered bridges will improve dramatically.

Benefits. The benefits from this study will be far-reaching and will be applicable nationally as well as regionally.

(1) The study will foster the development of new engineering standards for covered bridges, resulting in better preservation practices that meet the Secretary of Interior's Standards for Preservation Projects.
(2) Results can be applied to many historic covered bridges in the country.
(3) Results will improve opportunities for preserving the historic structural integrity of covered bridges that remain in use on roads.
(4) Results will help to strengthen the Vermont Historic Bridge Program and will support its efforts to develop a collaborative approach toward preserving historic transportation facilities.
(5) The study will introduce students of historic preservation and engineering to each other's disciplines.
(6) The study will strengthen collaboration between the Vermont Agency of Transportation and the University of Vermont, both its Department of Civil and Environmental Engineering and its Graduate Program in Historic Preservation.

(e) **Statement of Researchers Competence**

Warren Tripp – VAOT Structures Engineer. Warren Tripp brings more than thirty-six years of bridge design experience to the project team, including direct involvement with the rehabilitation of a very large number of covered bridges in Vermont. He is well versed in the design complexities of such bridges and is equally well aware of the lack of good design data. He also supervised the Vermont Historic Bridge Study. Covered bridges are both vocation and avocation to Mr. Tripp, who has assembled an unmatched collection of turn-of-the-century post cards of covered bridges, many of which no longer stand. His long tenure as Structures Engineer for the Vermont Agency of Transportation has given him a unique perspective on the evolving policies toward preserving one of the country's most important collection of covered bridges.

Jean-Guy Beliveau – Principal Investigator. Jean-Guy Beliveau is a Professor in the Department of Civil and Environmental Engineering at the University of Vermont. He teaches basic undergraduate courses in the analysis and experimental aspects of the mechanics of materials, including the behavior of wood members. He teaches structural design courses in reinforced concrete and structural steel, and has taught structural analysis. He has also taught a course on wood

design while in Canada, and recently gave a ten hour component on wood design to seniors in civil engineering working on their senior timber design. In this capacity, he is familiar with the BOCA building code used in Vermont and also the AASHTO code used for bridges. The 1997-senior design project dealt with a plate girder steel bridge over the Lamoille River. Engineers at the Vermont Agency of Transportation presented the project and design parameters to the students.

He also has supervised a senior project on the cable structure used to support the Cornish-Windsor covered bridge during restoration. He has consulted on two covered-bridge projects, one dealing with the Windsor-Cornish covered bridge over the Connecticut River and a structural rehabilitation study for the Lincoln covered bridge near Woodstock, Vermont. Professor Beliveau is familiar with computer models of structures and has worked with a number of finite element and other structural software packages, including, RISA, ABAQUS, MARC and NASTRAN.

Prof. Beliveau's research investigates the use of vibration and other measurements in assessing the structural integrity and stiffness of structures. Currently, he is using impact methods to assess the lateral stability of navy piers, and has recently worked on using modal testing methods to assess the axial compression and ballast stiffness of rails. These modal testing methods are proposed for the dynamic testing in the proposal. He has worked with colleagues in Mechanical Engineering and Electrical Engineering on using sensors on civil engineering structures, including buildings, bridges, and dams. In 1996, he was chosen as the Vermont Engineer of the Year in recognition for his research, teaching and professional contributions in the state of Vermont.

Robert L. McCullough – Project Contact. Robert McCullough helped to establish the Vermont Historic Bridge Program at the Vermont Agency of Transportation and was project manager for the preservation plan of the state's historic metal truss bridges. In 1997, the National Trust for Historic Preservation awarded its Trustees Award for Outstanding Achievement in Public Policy to the Vermont Agency of Transportation for the Vermont Design Standards and the Historic Metal Truss Bridge Study. With Jean-Guy Beliveau, he taught a course titled "Historic Bridges," and he was a panel member for the Transportation Research Boards recent publication, "Synthesis of Highway Practice 275. Historic Highway Bridge Preservation Practices." He has also contributed to a soon-to-be-published book about Vermont's historic bridges. As a full-time faculty member in the Graduate Program in Historic Preservation at the University of Vermont and as Co-Manager of the Vermont Historic Bridge Program, he is uniquely qualified to link the engineering and historic preservation expertise available in these two institutions.

Susan Scribner – Project Participant. Susan Scribner is Co-Manager of the Vermont Historic Bridge Program and earned a B.S. degree in Civil Engineering from Tufts University. As co-manager of this innovate program, she

will be responsible for incorporating the results of this project into a workable plan for the state's historic covered bridges. Ultimately, one of her most important roles will involve working with towns that own covered bridges, explaining the underlying rationale for decisions regarding preservation treatments. Her participation in this research project will assure a fundamental understanding of the design issues at stake, and her role is an indispensable one.

Brian Esser – Laboratory Coordinator. Brian Esser is Lab Area Coordinator for the College of Engineering and Mathematics at the University of Vermont. He maintains, operates, and coordinates the Votey machine shop and the various lab and materials testing areas. These include machine maintenance, supply purchasing, and limited instruction on machine usage. Brian obtained a BS in Mechanical Engineering from the University of Vermont in December of 1998, and he was chosen as the University of Vermont Student Engineer of the Year during his senior year.

Jan Lewandowski – Project Consultant. Jan Lewandowski is a timber framer specializing in historic preservation, particularly covered bridges and church steeples. He has restored twenty-three covered bridges in New Hampshire, Maine, Ontario, and Vermont, including the well-known Windsor-Cornish bridge across the Connecticut River. He has also built three new covered bridges in traditional fashion. He writes, lectures, and teaches widely on the topic of covered bridges and was a consultant to the Vermont Covered Bridge Study.

4. PRODUCTS

A written technical report will explain the results of this research. Should the modal testing be successful, a follow-up proposal for in-situ testing of an existing covered bridge will be submitted.

5. DISSEMINATION

The report summarizing the research results will be given to other states where covered bridges are located, and it will be published in a professional journal, the ASCE Journal on Bridges or the Journal for Experimental Techniques.

6. PROJECT BUDGET

Items (a) through (i) are assigned to NCPTT funds.

(a) Salaries:	Jean Guy Beliveau:	1,992 x Four Weeks:	$	7,969
	Robert McCullough		$	00
	Brian Esser:	2,500 x One Month:	$	2,508
		Sub-Total: Salaries	$	10,477

(b) Benefits: 34.10%		$ 3,573
(c) Graduate Student		$ 3,000
	Total Payroll:	$ 17,050
(d) Travel		$ 2,000
(e) Supplies/Materials		$ 5,000
(f) Consultant/Contractual:		
Jan Lewandowski	2,250 x Two Months	$ 4,500
(g) Publication /Printing		$ 20
	Sub-Total: Direct Costs	$ 11,520
	Modified Total Direct Cost Base:	$ 28,570
(h) Equipment (Laboratory)		$ 2,000
	TOTAL DIRECT COSTS	$ 30,570
(i) Overhead: 33% (Allowed); 51% (Actual)		$ 9,428
	TOTAL COSTS	$ 39,998

7. SUGGESTED PEER REVIEWERS

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APPENDIX A

HISTORIC COVERED BRIDGES - PRIORITY OF USES

Draft - December 8, 1999

The following uses for historic covered bridges are listed in order of priority. Preferences have been established to achieve two objectives. The first is a desire to maintain the historic use of these bridges as part of Vermont's network of roads. The second is a desire to preserve the historic structural integrity of these bridges to the maximum extent possible. The load capacity for each category varies.

(A) Special Use on Roads. Bridges will remain in use on roads but will be limited to very light traffic, primarily cars. This category of use assumes that alternative routes are available or are capable of being built at locations near enough to historic bridges to eliminate, or reduce to an acceptable level, any risk of abuse by overweight vehicles. At the same time, alternative routes must not compromise the settings for these historic bridges. Creative designs for bridge approaches, intended to prevent use by overweight vehicles, are encouraged. However, these designs must also avoid damage to settings.

This category of use assumes that the historic structural integrity of these bridges will be preserved to the maximum extent possible. If bridges suitable for this category of use have been compromised by extensive alterations, they should be restored to their original appearance.

- **Minimum Capacity**: The minimum capacity required is the maximum amount obtainable under the preservation treatments permitted for bridges in this category. Bridges should be confined to one-lane traffic.
- **Preservation Treatments**: Only preservation treatments 1, 2, and 3 are acceptable for bridges in this category.
- **Examples**: Warren Bridge (No. 6) in Warren; Comstock Bridge (No. 41) in Montgomery;

(B) Limited Use on Roads. Bridges will remain in use on roads and will be limited to vehicles that do not exceed 40,000 lbs. This category of use also assumes that alternative routes are available or are capable of being built at locations that accommodate vehicles weighing in excess of 40,000 lbs. The proximity of alternative routes, the degree of risk that bridges will be abused by overweight vehicles, and the historic structural integrity of bridges are the decisive factors in choices between Category A and Category B – Limited Use on Roads.

This category of use assumes that the historic structural integrity of these bridges will be preserved. . If bridges suitable for this category of use have been compromised by extensive alterations, restoration should be considered.

- **Minimum Capacity**: The minimum capacity for bridges in this category is 40,000 lbs.

- **Preservation Treatments**: Only preservation treatments 1, 2, and 3, 4, 5, and 6 are acceptable for bridges in this category.
- **Examples**:

(C) Alternative Transportation Use. Bridges will be adapted to alternative uses at their existing sites and returned to like-new condition. The setting of the bridge, including its approaches, should be preserved to the maximum extent possible. This category of use will require alternative routes. However, the design of any new bridge in close proximity to the historic bridge should avoid changing the setting of the historic bridge and should avoid interfering with views of the historic bridge.

This category of use assumes that the historic structural integrity of these bridges will be preserved to the maximum extent possible. If bridges suitable for this category of use have been compromised by extensive alterations, they should be restored to their original appearance. Evidence that a bridge has remained standing for one hundred years is sufficient proof that the structural capacity is adequate for alternative uses such as bicycles and pedestrians.

- **Minimum Capacity**: The minimum capacity for bridges in this category is that required to carry dead load and snow load.
- **Preservation Treatments**: Only preservation treatments 1, 2, and 3 are acceptable for bridges in this category.
- **Examples**: Creamery Bridge (No. 30), Brattleboro.

(D) Relocation. This alternative presumes that none of the three preceding categories of use is feasible, and it is an alternative of last resort. Relocation may be considered for any of the first three categories of use, and all requirements for the category selected will apply.

(E) Bridges Subject to Exceptional Constraints. The circumstances of some bridges pose exceptional constraints. A few have been so drastically altered that repairs required for an acceptable carrying capacity would necessitate reconstruction of the entire bridge. In other cases, bridges have been reinforced by systems that make the historic structure redundant. Bridges subject to such constraints shall be assigned to this category with the hope that acceptable alternatives for preservation will develop in the future. During the interim, a greater variety of preservation treatments are available for preserving these bridges.

- **Minimum Capacity**: The minimum capacity for bridges in this category is that required to meet the circumstances.
- **Preservation Treatments**: All preservation treatments are available for bridges in this category.
- **Examples**:

APPENDIX B

HISTORIC COVERED BRIDGES - PRIORITY OF TREATMENTS

Draft - December 8, 1999

The following treatments for historic covered bridges are listed in order of priority. Preferences reveal a desire to preserve the historic structural integrity of covered bridges to the maximum extent possible. Prioritization also allows identification of treatments that are appropriate for the specific categories of use. Treatments should also be applied in order of priority to individual elements of bridges.

1. Retain all existing materials that have not deteriorated beyond the point of repair. Where existing rot or other damage is not severe enough to require replacement, the materials should be repaired rather than replaced.
2. Replacement of existing materials in kind, meaning identical in type, quality, dimension, and region of origin. If materials from the region of origin are not available, then materials from other regions may be considered.
3. Application of traditional methods of strengthening such as the application of sister lattices in Town lattice truss bridges.
4. Replacement of existing load-bearing members with materials identical in type, quality, and region of origin but larger in dimension. However, the increased dimensions must not require alterations to the dimensions of any other important bridge components.
5. Replacement of existing load-bearing members with glu-laminated beams of identical dimension.
6. Reinforcement of load-bearing members with non-obtrusive modern materials such as steel rods or plates, glass fiber, carbon plates, or other materials.
7. Protection of load-bearing members by the introduction of steel beams that provide a safety-net for the bridge. The redundant structure must allow the existing timber frame to continue functioning, and a minimum clearance between steel beams and floor beams should be designed. The purpose of this treatment is to protect the historic bridge in case of structural failure, not to increase carrying capacity.
8. Introduction of glu-laminated beams as a primary structural system, forcing redundancy of the historic structural system.
9. Replacement of existing load-bearing members with timber of larger dimension but otherwise identical in terms of species and quality.
10. Replacement of existing load-bearing members with modern materials.

CURRICULUM VITAE- JEAN-GUY BELIVEAU

Professor, Department of Civil and Environmental Engineering, University of Vermont

EDUCATION

B. S., Civil Engineering, University of Vermont (1968); Ph.D., Civil Engineering, Princeton University, (1974)

PUBLICATIONS RELEVANT TO THIS PROPOSAL

Lee, J., Béliveau, J.-G., Huston, D., and Kim, S., "Use of Modal Testing to Identify Damage on Structural Tube", Proceedings, Structural Engineers World Congress (SWEC), July 1998, San Francisco, CA

Béliveau, J.-G., Shope, R., and Warren, G., "Structural Assessment of AWTTS Model Pier from Lateral Impact Test" Technical Report, Naval Facilities Engineering and Service Center", Port-Hueneme, CA, 1997

Béliveau, J.-G. And T.M. Murray, "Lateral Vibration of 115# Rail for Axial Compression up to 100 Kip", Report # CE/VPI-ST 96/03, May 1996

Livingston, T. , Béliveau, J.-G. and Huston, D. R., "Estimation of Axial Load in Prismatic Members Using Flexural Vibrations", Journal of Sound and Vibration, Vol. 179, No.5, 1995, pp. 899-908

Huston, D.R., Fuhr, P.L. and Béliveau, J.-G, "Bridge Monitoring with Fiber Optic Sensors," Proceedings, Workshop on Bridge Engineering Research in Progress, La Jolla, CA, 1992, pp 51-54.

Huston, D.R. and Béliveau, J.-G., "Bridge Inspection by Vibration Measurements", Region I-UTC Technical Report, 1992.

Huston, D.R., Béliveau, J.-G., and Durham, D., "Wind-Induced Failure of Bar-Cable on the Cornish-Windsor Bridge", Proceedings, 6th U.S./Japan Bridge Engineering Workshop, 1990, pp 27-39.

Schaefer, L. A. and Béliveau, J.-G., Innovations in Reconstruction; a Study of the Cornish-Windsor Covered Bridge, Senior Project, Bachelor of Science in Civil Engineering, University of Vermont, 1989.

Béliveau, J.-G. and Durham, D. "Lincoln Bridge, Woodstock, Vermont", Technical Report, The Peter Gratiot Engineering Company, Windsor, VT, 1989.

Huston, D.R., Gardner-Morse, M and Béliveau, J.-G., "Impact-Testing Modal Identification of a Cable-Stayed Pedestrian Bridge" Proceedings, Symposium on Bridge Research in Progress, Des Moines, Iowa, September 1988, pp 77-80.

Resume -Warren B. Tripp

Home Mailing Address:
P. O. Box 236
Groton. VT 05046

Office Mailing Address
Agency of Transportation
National Life Building
Drawer 33
Montpelier, VT 05633-5001

Education:
Graduate of Rensselaer Polytechnic Institute, Troy, New York
Degree: Bachelor of Civil Engineering, 1958

Relevent Work Experience:
1963 - 1983: Vermont Agency of Transportation, Structures Division. Worked at various levels of bridge design, including work on several projects involving the rehabilitation of historic covered bridges.

1983 - Present: Vermont Agency of Transportation, Structures Division. Worked as Structures Design Engineer, with a current staff of 53 employees in my unit. I am responsible for the oversight and management of a program of bridge design that has increased to a present level of approximately $40,000,000 per year. This program presently includes about fifteen projects for the rehabilitation of historic covered bridges, with design not yet started onmost of these projects. During this time I have been actively involved in the rehabilitation of several covered bridges, including the recent rehabilitation of the West Dummerston Covered Bridge in Dummerston, Vt. During this time I have become increasingly aware of the complexities of covered bridge design and the lack of good technical data on which to base such design.

Professional Affiliations (National Level)
Member of : American Association of State Highway and Transportation Officials (AASHTO) Subcommittee on Bridges and Structures.
Member of AASHTO Technical Committee for Bridge Replacement Surveys and Inspection Standards.
Member of AASHTO Technical Committee for Research.

CURRICULUM VITAE
ROBERT L. McCULLOUGH

CURRENT POSITION: Lecturer, Graduate Program in Historic Preservation, University of Vermont

EDUCATION:
Ph. D., City and Regional Planning, Cornell University (1993).
M.A., Historic Preservation Planning, Cornell University (1988)
M.S.L. (Master of Studies in Public Policy Law), Environmental Law Center, Vermont Law School (1983).
J.D., Cum Laude, Hamline University School of Law (1976).
B.A., History, Ursinus College (1971).

PUBLISHED BOOKS:
The Landscape of Community. A History of Communal Forests in New England. Hanover, NH: University Press of New England (1995).

ARTICLES AND CHAPTERS IN BOOKS:
"Town Forests – The Massachusetts Plan," in Stepping Back to Look Forward. A History of the Massachusetts Forest. Charles H.W. Foster, ed. Cambridge, MA: Harvard Forest in collaboration with Harvard University Press (1998).
"Vermont: Historic Roads and Bridges," in Saving Historic Roads. Design and Policy Guidelines, by Paul D. Marriott and the National Trust for Historic Preservation. New York: John Wiley & Sons for the Preservation Press (1997)
"Historic Preservation and Land Use Control at the State Level – Vermont's Act 250," in 14 Boston College Environmental Affairs Law Review (Fall, 1986), 1-29.

OTHER EMPLOYMENT: State of Vermont, Agency of Transportation (August 1, 1998 to the present). **Position**: Co-Manager of the Vermont Historic Bridge Program.

ADMITTED TO PRACTICE LAW: Minnesota, 1976; United States District Court, District of Minnesota, 1977. Vermont, 1984; New Hampshire, 1984. Inactive Status.

AWARDS:
National Trust for Historic Preservation, Trustees Award for Outstanding Achievement in Public Policy given to the Vermont Agency of Transportation for the Vermont Design Standards and the Historic Metal Truss BridgeStudy (1997).
Theodore C. Blegen Award, Forest History Society, for "A Forest in Every Town. Vermont's History of Communal Woodlands" (1995).
Inaugural recipient, Bell Grant, Forest History Society (1981)

SUSAN E. SCRIBNER

National Life Building, Drawer 33 • Montpelier, Vermont 05633-5001 • (802)828-3615

EXPERIENCE

VERMONT AGENCY OF TRANSPORTATION
Manager, Historic Bridge Program
Set direction for program and ensure all provisions of programmatic agreement establishing the program are met. Oversee preservation plans for historic covered bridges, masonry arch bridges and concrete arch bridges. Ensure preservation plan for metal truss bridges is implemented, including apprising municipal bridge owners of the program and encourage the granting of preservation easements as applicable. Manage complementary Adaptive Use Program whereby some bridges not deemed suitable for continued highway use are rehabilitated for adaptive uses such as for a bicycle/ pedestrian facility.

VERMONT AGENCY OF TRANSPORTATION
Enhancement Program Coordinator, 1996 - 1998
Develop and provide guidance and direct support to communities, not-for-profits and state agencies in developing projects to meet the provisions of this program and all applicable state and federal regulations. Projects within program have been far reaching in scope and have included development of bicycle and pedestrian facilities, acquisition of scenic easements, archaeological research, development of a book on Vermont's historic bridges, various planning studies, rehabilitation of historic buildings, parks and bridges and mitigation measures for highway run-off.

VERMONT AGENCY OF TRANSPORTATION
Various positions, 1984 - 1996
Several positions that have included planning studies, data gathering and statistical research, traffic signal design and management of consultant contracts for various types of projects.

EDUCATION

TUFTS UNIVERSITY
Bachelor of Science in Civil Engineering, 1982
Minor in Architectural History

Free Press 2/19/98

■ **FIGURE SKATING:** Michelle Kwan (above) remains the No. 1 gold medal contender going into the women's figure skating free skate Friday, **13B**

■ **BIATHLON:** Colchester's Dan Westover hopes for better results in the relay races this weekend, **11B**

■ **MEN'S HOCKEY:** Disappointing, embarrassing, disgusting — these are the words used to describe the U.S. men's ice hockey team's performance. But these are not only the words of coach Ron Wilson or Americans watching at home, team members, including St. Albans native John LeClair, feel they could have played better. "It's a huge, empty feeling," LeClair said, **13B**

■ **MASCOT FRENZY:** Snowlets popular item in Nagano, **9A**

ON TV TODAY

■ **12-3 a.m. (CBC):** Biathlon: women's 4x7.5k relay; alpine skiing, women's slalom second run; long track speed skating, women's 1000M final

■ **5-9 a.m. (CBC):** Short track speed skating, women's 500M final, men's 500M and 5000M relay prelims
9 a.m-1 p.m.: Repeat of previous programs

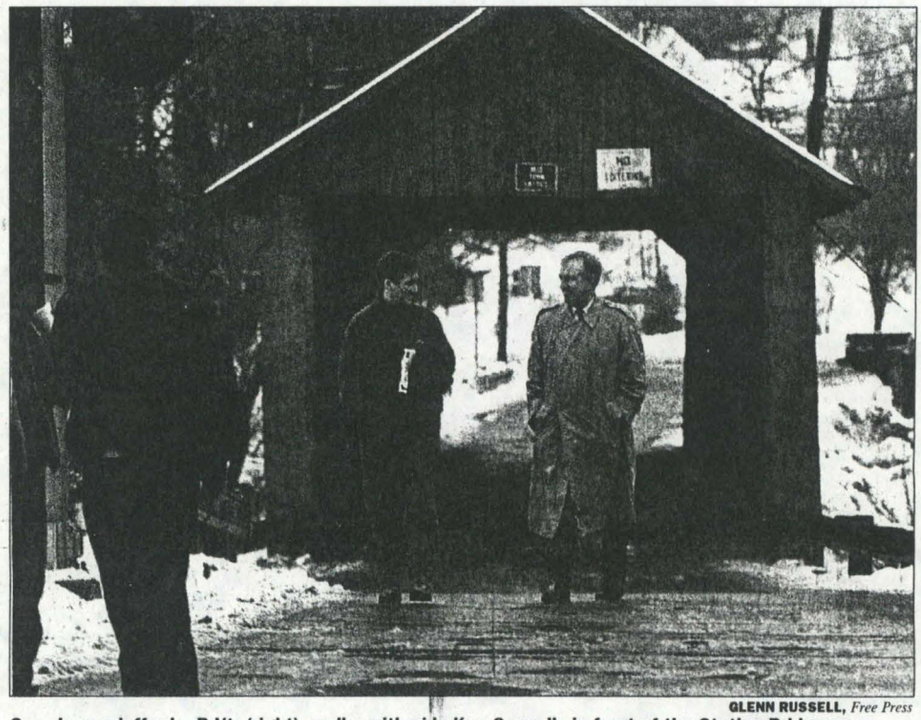
■ **2-5 p.m. (CBC):** Taped highlights

■ **7-11 p.m. (CBC):** Cross-country skiing, women's 30K free; alpine skiing, women's giant slalom first run

■ **1-6 p.m. (TNT):** Event coverage: Nordic combined jumping, biathlon, short track speedskating. Preview: bobsled, alpine skiing, speedskating. Review: alpine skiing.

■ **8-11 p.m.; 12:35-1:35 a.m. (CBS)** Preview of ladies figure skating, women's slalom, women's speedskating, men's and women's short-track speedskating, Nordic combined and semifinals men's ice hockey.

Bridges span history



GLENN RUSSELL, *Free Press*

Sen. James Jeffords, R-Vt. (right), walks with aide Ken Connolly in front of the Station Bridge on Wednesday afternoon in Northfield Falls. Jeffords and state Transportation Secretary Glenn Gershanek announced $25 million would be made available to help preserve covered bridges around the country and establish a covered bridge museum in Vermont.

Jeffords bill provides for Vt. museum

By Stacey Chase
Free Press Staff Writer

NORTHFIELD FALLS — Standing in a rainy drizzle in front of the historic Station Bridge, Sen. James Jeffords, R.-Vt., said Wednesday he'll introduce a bill that would preserve the nation's historic covered bridges and build a museum to them in Vermont.

"As we leave this millennium and this century, and enter into the next century, it is important that we preserve ... some of the things which epitomize our state and many other areas of the country — and that is with covered bridges," Jeffords said.

Jeffords' legislation — the National Historic Covered Bridge Preservation Act — provides $25 million for the U.S. Department of Transportation to inventory, repair and maintain covered bridges. Vermont is hopeful it might get "a good share" of that money, Jeffords said.

Jeffords' news conference to unveil his proposal was held at "the only place in the state, or probably even in the country, that you can stand ... (on) one covered bridge and look to another covered bridge," he said.

The Station Bridge, as well as the Second Bridge and Third Bridge, are within a half-mile of each other on Cox Brook Road. The Station and Second bridges can be included in the same picture — the only place in New England where two historic covered bridges can be photographed together.

"I feel strongly that it is important that, as best as we can, we should try to preserve those ... (covered bridges) that are left," Jeffords said. "In my mind, they should be preserved. And what

See **BRIDGES,** *5A*

Covered bridges

■ **NUMBERED:** Once more than 12,000, now fewer than 800 remain in the United States

■ **IN VERMONT:** 106 — 76 municipally owned bridges, six owned by the state's Division for Historic Preservation and the remainder privately owned

■ **INFORMATION:** For more information, read "Covered Bridges of Vermont" (The Countryman Press of Woodstock, 1996) by Brandon author Ed Barna.

AAA to combat road rage

The Associated Press

WASHINGTON — Tailgating, running red lights, giving other drivers dirty looks — the American Automobile Association says it's time for a change in attitude behind the wheel.

The AAA announced a campaign Wednesday aimed at quelling the anger of aggressive drivers, who often provoke or commit violence on the road. According to the association, the number of accidents and deaths resulting from "road rage" is on the rise, and drivers need to take a deep breath and relax before hitting the streets.

"If we can convince millions of calm, mature motorists not to get sucked into encounters with angry drivers, many lives can be saved and injuries reduced," said David Willis who heads the AAA's Foundation for Traffic Safety.

The association will begin airing radio public service announcements to encourage drivers to obey not only the rules of the road but also the rules of common courtesy.

The AAA offers these tips:

■ Allow for extra driving time.

■ Listen to soothing music.

■ Avoid eye contact or obscene gesturing with other drivers.

■ Don't block the passing lane.

INSIDE: Harry Caray dies in California

Harry Caray, who took millions of fans out to the ballgame on radio and television in a career that spanned almost 60 years, died Wednesday, four days after collapsing at a Valentine's Day dinner. He was believed to be 77.

The often offbeat Hall of Fame broadcaster covered baseball's greats from Musial to Mays to Maddux. **Story, 11B**

Volume 171, No. 50

INDEX

Act 60 change mi

Other downtowns could benefit, too

By Sona Iyengar
Free Press Staff Writer

A proposed revision to the new school funding law would spur economic development in Vermont's downtowns — and give Burlington the money it needs to complete its proposed Filene's project, state lawmakers said Wednesday.

The proposal would allow municipalities to use a portion of new sales taxes generated from development in special downtown tax districts, instead of sending it to the state.

The measure, which might be added to the economic incentives portion of the Act 60 revisions bill, could gene
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said Senate Pr
pore Peter Shur

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Sen. Jan B
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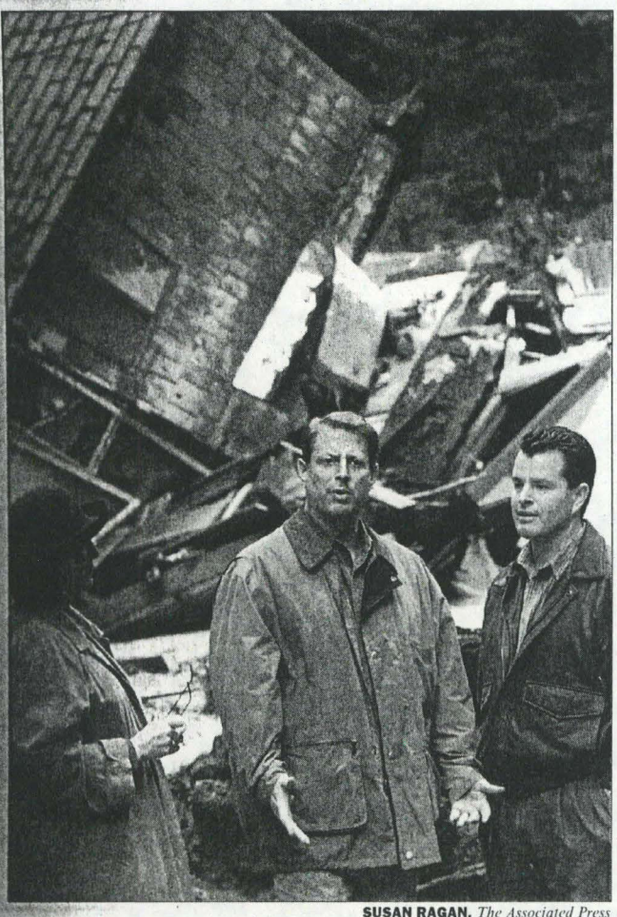
Calif. mudslide site



SUSAN RAGAN, *The Associated Press*

Vice President Al Gore talks to Rep. Lynn Woolsey, D-Calif. (left), and geologist Bill McCormick at the Rio Nido mudslide Wednesday.

when it rains the bees huddle in their hives.

The sky was clear Wednesday. "We need two more weeks like this to pollinate all varieties," Driver said.

However, there was a threat of rain today and more storms were lined up across the Pacific.

Lettuce growers in the Salinas Valley, dubbed the nation's Salad Bowl, also need relief because continued heavy rain will disrupt planting schedules, says Michael Boggiatto, who harvests and markets for lettuce growers.

"As rains continue, and ground continues to be too wet to work up and plant, there's a possibility that there may be some gaps in production," Boggiatto said.

Anticipating shortages in California's $735 million crop, some farmers in Arizona and New Mexico already have switched to growing lettuce, he added.

"There could be overproduction at some time slots because of these people coming in with product who wouldn't normally have it," Boggiatto said.

Southern California strawberries have been hit hardest by the rain, suffering $10.7 million damage, according to state Department of Food and Agriculture statistics. But those growers expect rain this time of year and lay out their fields with good drainage, said Theresa Thorne of the California Strawberry Commission.

"It's part of the equation, so if anybody can survive El Nino, I think it will be strawberry farmers," Thorne said.

The statewide loss for all crops has reached $65.6 million, far below the $748.6 million damage caused by a pair of brutal storms in 1995 and $245 million from extensive flooding last winter around New Year's Day.

But farmers still have reason to fret.

"The last third of El Nino is the wettest," agriculture weather forecaster John Hibler told a group of farmers. "Be ready for some wet ground. I think it's going to be a soggy spring."

ke could hinge on health care

GLENN RUSSELL, *Free Press*

t administrator for the Vermont Joseph Blanchette (center), director nt National Education Association, program services for VSBIT, are in insurance plans for teachers across the biggest issue in the contract dishool district.

payment at the doctor's office.

Moving further

The Colchester School Board took that movement one step further in the 1995-96 and imposed a contract that required teachers pay 20 percent of their health care premiums. It's an imposition that's demoralized the Colchester teaching staff, said John Devino, a 25-year high school math teacher.

"An imposition is a sign that one party is going to exercise their power over the other," Devino said, pointing out that there's been a "brain drain"

Teacher benefits

Here is a look at the progression under way from fully paid medical insurance for teachers to shared payment for managed care in Chittenden East.

YESTERDAY

Until 1994, most districts paid 100 percent of the premium on the JY Plan of Blue Cross and Blue Shield, a very comprehensive plan.
The JY Plan pays 100 percent of the first $200 in doctor bills.
After paying a deductible, the insurance kicks in to cover 80 percent.
Maximum medical cost:
Single: $500.
After this the insurance pays the rest.

JY Plan premium this year:
Single: **$2,102**
Two people: **$4,145**
Family: **$5,574**

TODAY

VEHI PLAN
Under the Vermont Education Health Initiative, teachers have three options:
■ The districts pay 90 percent of the JY Plan.
■ The districts pay 100 percent of the managed care premium, which requires a $5 co-payment at the time of an office visit (or a $20 co-pay for vision exams).
■ Teachers pay the first $200 in medical expenses; then after initial deductible, the insurer splits the cost with teachers 80/20, until the individual has paid $500 in medical costs. Then the insurance pays 100 percent.

Managed care premium this year:
Single: **$1,903**
Two people: **$3,741**
Family: **$5,015**

STARTING IN MARCH

VEHI PLAN
Teachers pay 10 percent of the managed care premium plus $5 co-payment at an office visit; or teachers pay 20 percent of the JY Plan premium.

Across the state, 50 percent of the 13,000 subscribers to the Vermont School Boards Insurance trust choose the JY Plan; 40 percent, the managed care; 10 percent, the plan requiring the $200 initial deductible

Alan Mendel, a member of the Mount Mansfield Union Board and the Chittenden East Executive Committee, served as a negotiator for the school district. He said Chittenden East's teachers have also complained of the same disrespect and demoralization.

"I've heard them say we don't

get back to the bargaining table — to discuss the 1998-99 teachers' contract.

"This year is a settled issue," Mendel said.

BRIDGES: Covered spans get attention

Continued from Page 1A

better place to preserve them than Vermont?"

Grant sought

The bill, which Jeffords says he'll introduce in early March, would likely become an amendment to a road funding law known as ISTEA, which stands for Intermodal Surface Transportation and Efficiency Act.

In addition, the bill asks that a grant be made to establish the National Covered Bridge Museum in Vermont. The museum would portray the history of covered bridges to the public and conduct research on the most appropriate techniques for preserving them, according to the bill.

No specific dollar amount for the museum is requested. As far as the location, Jeffords said: "We'll have to worry about that when we get the bill through."

Repairs needed

Glenn Gershaneck, Vermont's secretary of transportation, said covered bridges throughout Vermont continue to deteriorate due to arson, floods, decay and neglect.

"The condition of the bridges is such that, the longer we wait to attack them, the tougher it's going to be to save them. And the more expensive it will be," Gershaneck said.

He added: "We don't have any bridge that's ready to fall in."

Currently, repairs on about 20 percent of the 76 publicly-owned covered bridges in Vermont are included in the state's $12 million Town Highway Bridge Program.

"One of the problems that we've got for pushing them along faster is that these bridges compete with everything else that's in that program," Gershaneck said. In the next decade, another half of the remaining bridges will need repairs, he added.

Jefford's bill would provide an alternative, and exclusive, source of funding for covered bridges.

"What we would like to reach is a point where we spend money for basic maintainence, rather than wholesale rehabilitation," Gershaneck said.

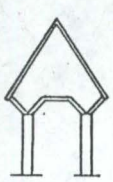
Northfield's Supervisor of Public Works Bill Lyons grew up in Northfield Falls and says the covered bridges mean a lot to him.

"I used to play in them, hanging dummies from the rafters. You'd pull a rope and they'd drop down in front of cars," he recalled. "It was quite a lot of fun."

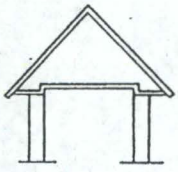
Priority: **Normal**
To: **"Elsa Gilbertson" <ElGilbertson@gate.dca.state.vt.us>**
From: **"Joseph Nelson" <jcnelson@together.net>**
Subject: **Fw: Covered Bridges**
Date sent: **Thu, 05 Feb 98 14:10:48 PST**

> Date: Thursday, February 05, 1998 11:24:48
> From: jcnelson@together.net
> To: ElGilbertson.dca.state.vt.us
> Subject: Re: Covered Bridges
>
> Ms. Gilbertson: Thank you for helping me find information and resources on
> historic preservation. And thank you for the run down of the bridges that are
> not on the National Register.
>
> You are correct about the Chamberlin Bridge in Lyndon, it is in the listing, I
> overlooked it.
> About the Stoughton/Titcomb Bridge: Milton Graton describes moving this bridge
> in his book: The Last of the Covered Bridge Builders: He moved two bridges
> from the Weathersfield flood control project area around Stoughton Pond. One
> of them was the Salmond Bridge, which he left in Amsden Village. The other,
> the Stoughton Bridge, for lack of other options, was set up in Andrew
> Titcomb's hay field in Perkinsville. The Upper Falls Bridge, is found off
> Route 131 near Downers, and is also called the Downers Bridge.
>
> Can you suggest a contact in the Agency of Transportation? I am interested in
> tracking the status of the bridges that have been closed in the aftermath of
> the covered bridge inspection program, and for other reasons. These are the
> Creamery Bridge in Montgomery, the Hopkins Bridge in Enosburg, the Poland
> Bridge in Cambridge Junction, the Paper Mill Bridge in North Bennington, the
> West Dummerston Bridge, and the Fuller Bridge damaged in last summer's flood.
> I am currently watching the progress on the Westford Bridge.
>
> My interest is that of a writer. I am looking forward to the second printing
> of my book, Spanning Time: Vermont's Covered Bridges. I am currently keeping a
> list of revisions for that second edition. Thank much for your kind attention,
> Joe Nelson.
>
> P.S. Does your office make use of citizen volunteers?
> P.P.S. Catch my web page -
> http://homepages.together.net/~jcnelson/explorin.htm. I can always use a
> critic.

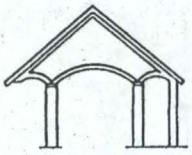
Portal Designs of New England's Covered Bridges



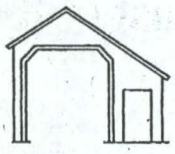
Bennett Bridge
Wilson's Mill,
Maine



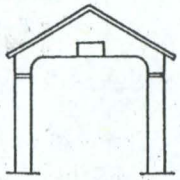
Lovejoy Bridge
South Andover, Maine



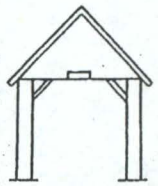
Lyndonville,
Vermont



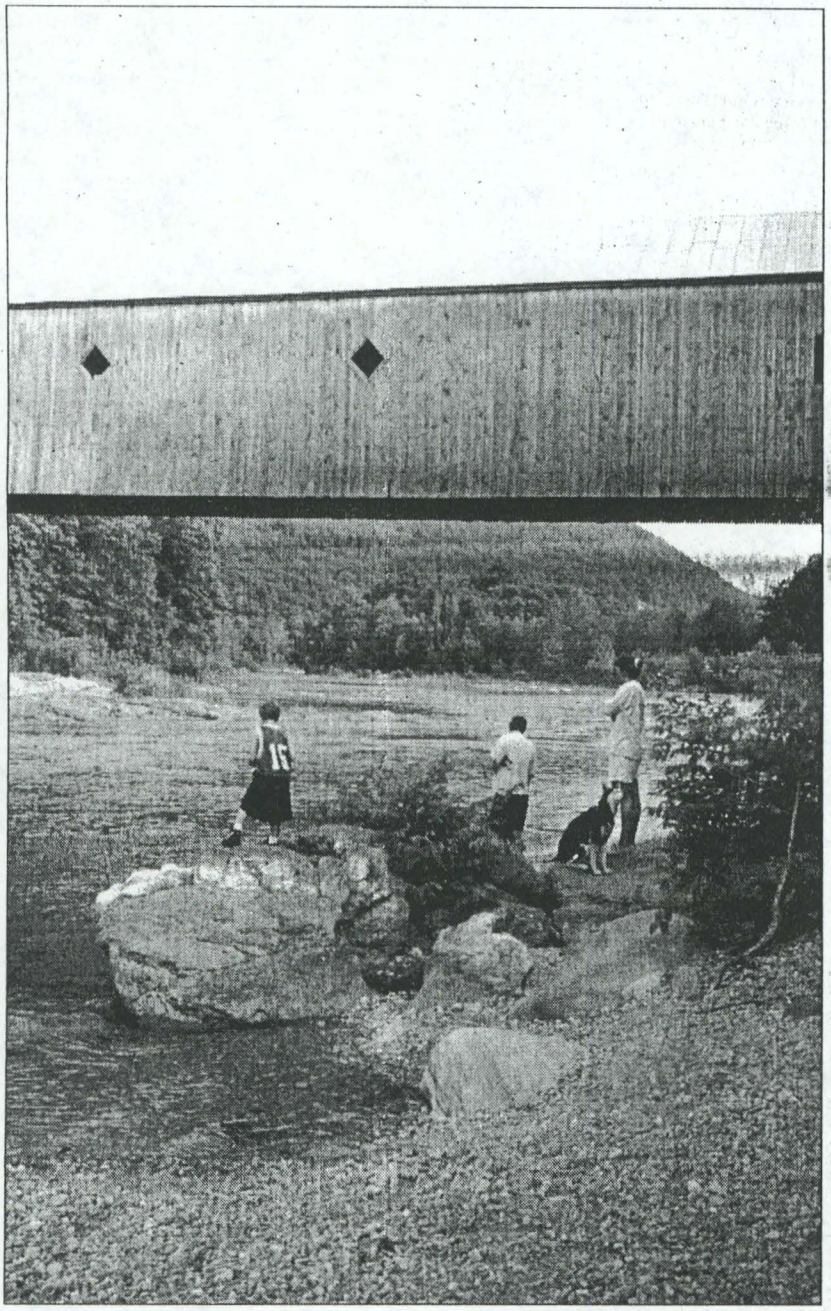
Creamery Bridge
Brattleboro, Vermont



West Cornwall,
Connecticut



Arthur Smith Bridge
Lyonsville,
Massachusetts



A family fishes in the West River at the West River at the West Dummerston Bridge, a two-span Town lattice built in 1827 by Caleb Lamson. At 280 feet, it is the longest covered bridge entirely within Vermont.

DANGER!

Neglected, decaying and hard to find,

Vermont's Covered Bridges

deserve better treatment

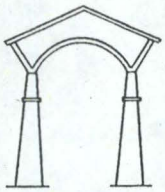
Story and photographs by Ed Barna

When I tell people that I spent much of the past summer taking pictures for a book on Vermont's covered bridges, I'm often asked, "Did you meet any lonely farmwives?"

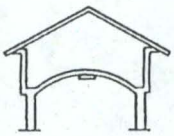
The reference is of course to the runaway bestselling romance *The Bridges of Madison County*, which begins with *National Geographic* photographer Robert Kincaid's quest for covered bridges and leads to a brief but passionate affair with his guide.

"No," I reply, "but I've met a lot of lonely covered bridges."

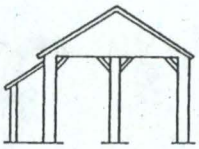
Ed Barna is a free-lance writer.



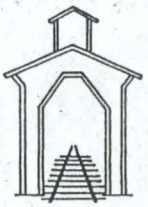
East Shoreham, Vermont



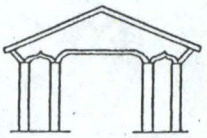
Albany, New Hampshire



Museum Bridge Shelburne, Vermont



Hardwick, Vermont



Asuelot, New Hampshire

My reply is both flippant and serious. As the summer wore on, I came to feel that Vermont treats these priceless, irreplaceable treasures poorly in comparison with other states like New Hampshire and New York.

There seem to be serious shortfalls in conserving the bridges, in educating the public as to why they matter, in promoting them as tourist attractions and in planning for their future.

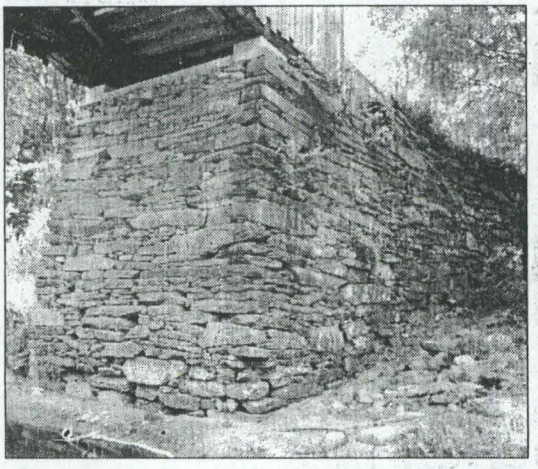
Nor was I alone in this opinion. Covered bridge restoration experts, historic preservation officials, relatives of former bridge builders, and people living near bridges all seconded the conclusion that at a time when so-called heritage tourism seems to be burgeoning, Vermont is overlooking major assets.

At the same time, it seemed as if some sort of awakening might be in progress. The book I was working on, for one of Vermont's publishers, turned out to be only one of several such efforts to produce, for the first time, a useful guidebook.

The Agency of Transportation had been conducting a major study of the state's covered bridges, and was taking greater account of preservationists' recommendations. And everywhere I went, those who lived near the bridges reported a steady traffic of photographers, artists, and other sightseers.

While I'm still frustrated by what I see as less-than-adequate care for covered bridges, I find it hard to blame anyone. I myself am a classic example of a native Vermonter who never appreciated them while growing up, and has only slowly come to understand their true significance.

It's been a memorable summer, with treks through the almost visionary landscape of far northern Vermont, unexpected natural wonders like the day yellow swallowtail butterflies congregated near every bridge, idyllic scenes at bridgeside swimming holes, and hours spent in a dreamlike state. But of all the joys, the greatest has been reaching across the centuries to a greater respect for what the early Vermonters and their Yankee contemporaries accomplished with wood. I have come to believe not only that it is worth the cost of maintaining historic covered bridges, but also that it is practical and economical to build more of them, especially now that global warning and ozone depletion have shown us the need for a more sustainable way of life.



This fieldstone abutment at the Downers Bridge in Weathersfield is one of the finest dry stone bridge foundations in the state.

By the Light of the Burning Bridge

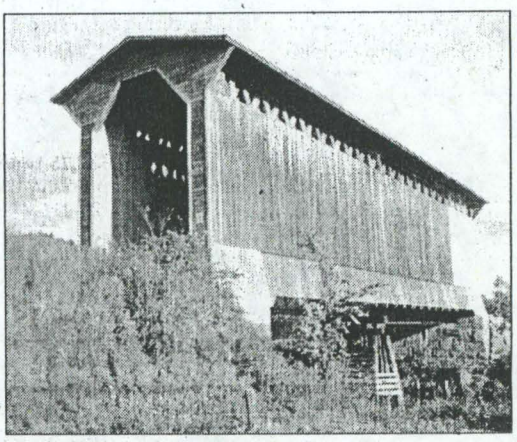
Growing up in and around Brandon, I took the area's dozen or so covered bridges for granted, like so much of the state's beauty.

Living in New Hampshire after college, a kind of turning point came through a close friendship with Richard J. Ducey, who has worked at various times as an antiques dealer, furniture refinisher, barn mover and house builder. A collector of antique hand tools, he brought to life something my history books hadn't covered: what I now think of as America's Great Age of Wood.

Shipwrights, wainwrights, wheelwrights, millwrights, coopers, cabinetmakers, carpenters — these men understood fine details of selecting, sawing and joining wood that modern factory production has largely bypassed. Ducey collected and kept in use hundreds of hand-made planes, each with a special purpose and each necessary to reproduce antique woodworking.

Particularly, the old-timers understood timber framing, or post-and-beam construction, as it's also called. To put together clipper ships, steepled churches, and New England's classic barns, they eschewed nails, favoring braced and pegged all-wooden joints.

Ducey told me stories of the fantastic strength this type of integrated, unitary construction brings to buildings. In one case, he said, a wrecking ball was brought in to demolish a colonial-era house — and bounced off, forcing the crew to do their dirty work by hand.



The Fisher Bridge in Wolcott is one of two covered railroad bridges remaining in Vermont. A steel I-beam now reinforces the wooden timbers.

But my real appreciation of timber-framed bridges began, regrettably, with the saga of the burning of Dean's Bridge in Brandon in 1986. Some of the disaffected youths who were hanging around the town (this from a reliable police source) decided a good prank would be to pour gasoline on the 133-foot structure and set it ablaze.

The town then had to decide what should replace the historic bridge. A strong faction advocated a new covered bridge. A bridge builder from Ashland, NH, named Milton Graton was ready and willing to erect one for less than $100,000, and insisted it could carry an adequate traffic load. Graton had already shown it could be done by building a covered bridge in Woodstock in 1969. Not only had he used historic methods of construction, he had insisted on using oxen to tow the completed bride into place.

But state and federal funds wouldn't apply to such a venture, so the town's share of the cost would be less with a concrete-and-steel bridge. Truckers and farmers favored a stronger bridge, and others didn't want to waste money on something that could be torched again. It took a verbal conflagration at town meeting to decide what to do. In the end, a million-dollar concrete-and-steel bridge spanned Otter Creek — and today, I'm ashamed to say I voted for it.

In a parallel career, I began teaching courses for Elderhostel, a nationwide program which combines mini-courses and vacation stays for senior citizens. Two years ago, Jerome Wyant, a dean at the College of St. Joseph, had the idea of an Elderhostel course on covered bridges, and asked if I would teach it. I jumped at the chance, and plunged into the research literature.

The Covered Bridge State

Almost from the start, it was a schizophrenic experience. On one hand, there was plenty of material on covered bridges in general, largely due to the research and writings of Richard Sanders Allen, Herbert Wheaton Congdon, Eric Sloane, and the

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COVERED BRIDGE

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American Society of Civil Engineers, all nearly a half century ago.

There was lore about their roles as "kissing bridges" (somewhat like walking under mistletoe), wishing bridges, childhood playhouses, and even sites for town events such as church suppers and political rallies.

But finding up-to-date information about Vermont's bridges proved unexpectedly difficult. One of my first actions was to call the Division of Travel and Tourism to get a list of the state's covered bridges. They didn't have one. Try the Division for Historic Preservation, they suggested. The DHP list turned out to be an outdated promotional handout, listing many bridges that no longer existed and missing several that had been added.

The official state highway map had covered bridge symbols on it, but these faint blue marks often bore no relation to the actual location of the bridges. Worse yet, many bridges weren't indicated, especially if they had been closed to traffic.

Had it not been for a couple of commercial road atlases, I would never have been able to find the bridges. But even there, problems abounded: covered bridge symbols on the wrong side of the road, cryptic directions, absent bridges, town names mixed up with village names, no-name roads, all leading to wild goose chases.

Knowledgeable local informants were just as hard to find, especially in remote areas of the Northeast Kingdom. A surprising number of residents had no idea how many bridges were in their towns, let alone where they were. At least my frustration was mitigated somewhat by the evident need for the book I was preparing.

The official disorganization seemed odd because Vermont is clearly the nation's leading covered bridge state. There isn't an up-to-date bridge census that I know of, but back in 1954, Allen counted 390 in Pennsylvania, 349 in Ohio, 174 in Indiana, 149 in Oregon, and 121 in Vermont.

Dividing the number of bridges into the number of square miles in each state, Vermont's 79 square miles beat out Pennsylvania's 116 for first place. Even if no other state had lost a single bridge in 41 years, Vermont would still be number one.

Iowa? With 56,275 square miles, it had 13 bridges in 1954, or 4,328 square miles per bridge. As I tell my Elderhostelers, if you're looking for lonely farmwives, go to Iowa; if you're looking for covered bridges, come to Vermont.

But Vermont itself has yet to realize what it has. How often have you seen an ad proclaiming us the covered-bridge heartland of America?

This pattern of neglect wouldn't have been so irritating had I not taken a look at some covered bridges in New Hampshire while preparing to lead a tour last summer. There, I found state highway signs pointing the way to the bridges, and well-designed and maintained parking places for visitors. Each bridge was numbered for reference to maps or to a lavishly illustrated state highway department guidebook, and each site had an interpretive sign. The contrast with Vermont could not have been more complete.

Heartwood

Covered bridges are some of our best monuments to the old forests of New England, the virgin timberlands whose tallest spires were once blazed with a special mark reserving them as masts for the King's Navy. Wood of the size and quality those forests produced is simply impossible to find today.

The late Milton Graton — whose son Arnold and nephew Stanley now carry on his bridge-building work — wrote a book that helped explain the difference. Trees that grow in the middle of a dense, naturally evolving forest have very few side branches (the light is above them, not to the side) so there are few knots or imperfections in the resulting timbers. They grow very slowly, putting on small annual rings, so the wood is extremely dense.

Allowed to survive for centuries, such trees become so thick that timbers can be cut entirely from heartwood, rather than including the softer, outer sapwood. One reason some covered bridge timbers show the marks of hand hewing is that the trees were too large to be taken to a sawmill and had to be shaped into square timbers with an adze where they fell.

The U.S.S. Constitution was called "Old Ironsides" because its builders chose such old-growth oak trees for its outer planks (this from Eric Sloane) that cannonballs literally bounced off.

That's the sort of wood in the bottom chords, as they are called, that carry most of the weight in covered bridges, though it is spruce, hemlock or pine rather than oak. David Lathrop, the Agency of Transportation's engineering section supervisor, said one reason the state bridge designers sometimes specify glue-laminated timbers during covered bridge repairs — to the consternation of purists — is that the same type of wood isn't available any more.

Much of my education came through Jan Lewandoski of Stannard, who has built three covered bridges, including one in Vermont at Kent's Corners, and has repaired many of Vermont's classic bridges. He said that engineering schools have put the designs of century-old covered bridges though computer programs, only to learn that, theoretically, the bridges should have collapsed of their own weight. But the strength values used in the software programs are based on regrowth woodlands, not virgin forests.

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COVERED BRIDGE

Continued from Page 6

It is possible to replace each part of a covered bridge one by one as problems appear — a sharp contrast with metal bridges, which are more subject to catastrophic failure. Indeed, this is one advantage cited by those who advocate building more of them.

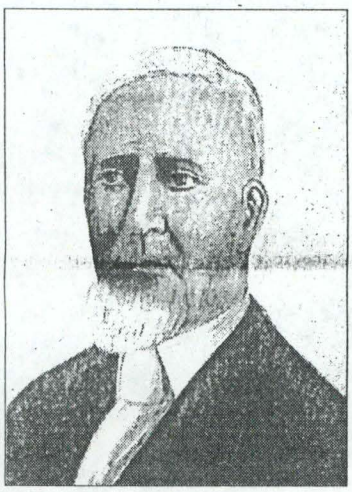
But that sort of interchangeability shouldn't become an excuse for neglect. The original timbers are national treasures, and I believe the state should take a greater role in assuring that the roofs of covered bridges don't leak and deteriorate them.

In Truss We Trust

Important as straight, dense, and knot-free beams were to the early bridge-builders, the designs were of even greater significance. Another reason Vermont's covered bridges matter is because they symbolize one of history's leaps forward: the unparalled revolution in wooden bridge-building techniques that took place in the first half of the 19th century.

As steel began to replace wood later in the 19th century, the bridge designers drew on the work of wooden-bridge designers. Ironically, those metal bridges are now more at risk than the covered bridges, according to the Division for Historic Preservation.

There had been covered bridges in Europe, where timber-framing helped build the great cathedrals. An Italian architect named Palladio had sketched out four ideas for wooden bridge trusses as early as the 16th century. But for lack of trees, and because most of the rivers were already crossed with Roman-style stone arch bridges, Palladio's ideas remained uninfluential — until they arrived in 18th century America. With the Revolutionary War won, there was a need to bridge many rivers and open up the new country, and the presence of immense forests suggested a way.



Nicholas M. Powers

It was in Vermont, at Bellows Falls, that Col. Enoch Hale in 1785 built a 365-foot, two-span (shore to island to shore) wooden bridge that opened many people's eyes, as well as opening up Vermont to trade with the Boston market. Although it wasn't covered — an 1804 Timothy Palmer bridge in Philadelphia began that trend — Hale's bridge is acknowledged to be the one that started the surge of design work by showing wood was capable of spanning large rivers.

Here, it is necessary to talk a bit about bridge engineering. In a covered bridge, the sides do the work, not the floor, and certainly not the roof, which is only there to keep the rest of the wood dry so it won't rot.

Each side of a true covered bridge is a truss, a unified combination of architectural members. The truss spreads the stress from the bridge's weight, in effect shifting the load to where the ends of the truss rest on streamside abutments.

It would be possible to make one huge timber out of many boards for each side, but that would weigh too much. (Modern "stringer" bridges do something similar by using huge steel I-beams as the bottom stringers, and get away with it because steel is so strong in proportion to its weight.)

But a wooden truss acts like a gigantic plank standing on its side, creating an integrated structure that weighs much less that a solid, laminated board would because of all the empty spaces in the design.

The arrangement of the timbers is the key, because a good design takes advantage of wood's great strength when force is not applied across the grain. The most remarkable examples of this come from engineering schools and Odyssey of the Mind competitions in which contestants create covered-bridge-like structures out of less than a pound of balsa wood. These airy, seemingly flimsy balsa wood tunnels withstand almost miraculous weights before they are crushed during the judging.

Once I understood something about their design, covered bridges seemed more resourceful than rudimentary, more ingenious than improvised. The concept was particularly important during the 1800s — an expansionist time when all sorts of schemes were hatched for roads, canals and, later, railroads. Anyone who could devise and patent a quicker, easier, cheaper way of building a stronger wooden bridge stood to reap immense royalties from the invention.

First there was self-taught architect and house-builder Timothy Palmer, born in Massachusetts, who in 1797 took out a patent on an arched truss he used to span major rivers like the Potomac, Schuykill and Delaware. But his Palladio-style designs had one great deficiency: the traveler had to go up and down, up and down, to cross a river.

Theodore Burr, who learned timber-framing from his Connecticut millwright father, took the next step, adapting a Palladio design into a combination of arches and multiple kingpost trusses (see diagram). In 1817, he patented the Burr truss, which had a level roadway, a design that was a prototype for thousands of bridges, including the first Vermont covered bridge (now gone) in 1824 at Highgate Falls.

But the real leap forward, one that had no precedent in Europe, came in 1820 when Ithiel Town, a Connecticut architect and builder, patented his "Town lattice mode," with the double lattice (see diagram) patented in 1835. Using criss-crossed diagonal planks rather than massive timbers, it was easier to build and phenomenally strong.

Eric Gilbertson, the head of the Division for Historic Preservation, said he knows of only one instance in which a Town lattice truss failed in Vermont, as opposed to the floorboards giving out. A trucker tried to run it with an illegal load, heard the timbers cracking, got out and ran. Had he kept driving, the bridge would have survived, Gilbertson said. But as it was, "the bridge literally exploded. There were pieces scattered from hell to breakfast," due to the even distribution of stresses.

Most of Vermont's bridges are Town lattices, a name that sometimes misleads people into thinking they were called that because towns built them. It was said that the Town lattice could be "built by the mile and cut off by the yard," a statement that almost literally came true in this century when a developer bought a disused bridge in Cambridge, Vermont and moved half to South Pomfret and half to Weathersfield to become housing project entrances.

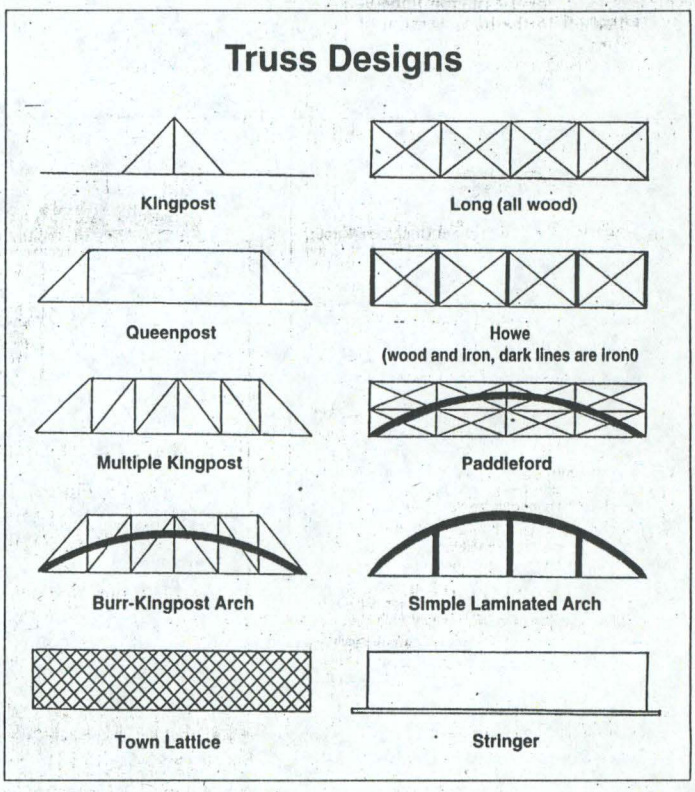
In 1830, Town found a major competitor in New Hampshire-born Army engineerCol. Stephen Long, who patented a truss with boxed X's. But after 1840, both men were succeeded by William Howe of Spencer, Mass., who solved the weakness in covered bridges — the tendency of vertical stress to overcome the wooden joints — by substituting vertical iron rods (giant nuts and bolts, in effect) for the vertical timbers in a design similar to Long's.

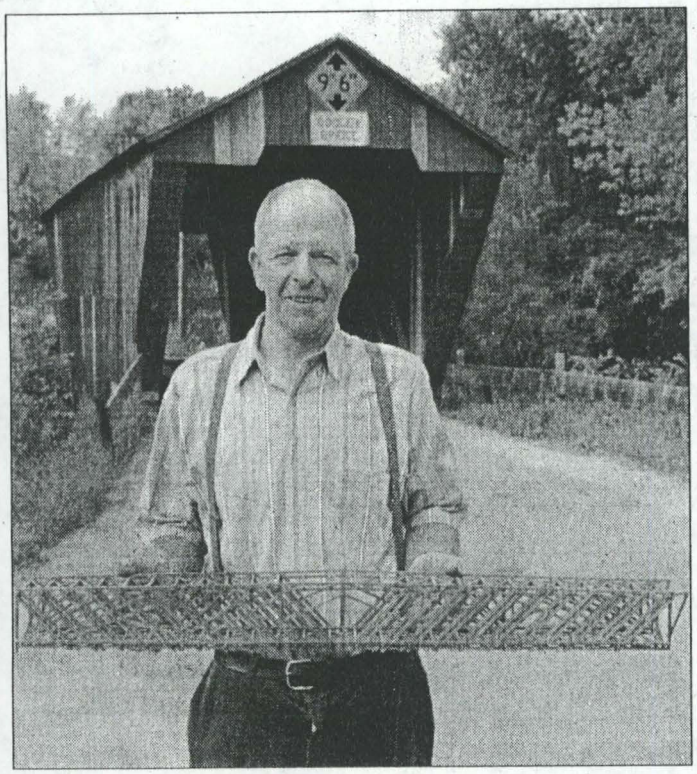
Both Howe and Town trusses were built into the 20th century, with Howe's design especially important to railroads because it could be pre-manufactured and shipped in kit form. Proponents of building new covered bridges point to the way these structures carried locomotives, which weighed 60 tons or more.

There were other gifted builders who never patented trusses. Among these was the man often thought to be the greatest of them all: Nicholas Montgomery Powers.

A Legend in His Own Time

Born in 1817 in a log cabin near Pittsford, Powers was the son of a wheelwright and builder. He quickly showed an aptitude for mathematics and model-building, worked





Robert Wood, a grandson of Nicholas Powers, holds a model Powers created for an experimental truss that Powers never had a chance to construct. Behind him is Pittsford's Cooley Bridge, built in 1849.

with local bridge builder Abraham Owen, and at the age of 19 successfully proposed building a covered bridge where Route 7 now crosses Furnace Brook near its junction with Route 3.

His father had to sign an agreement with the selectmen to pay for any timbers young Nicholas spoiled. But the bridge was strong enough to last 96 years and carry the weight of a 20-ton steamroller that the state crew had brought to help build a modern bridge at the site in 1931.

His reputation spread, and not just as a bridge builder. He moved the spire on the Rutland County Courthouse to the front of the building where it is today, erected West Rutland's first marble quarry derrick, constructed numerous barns, and built the Kingsley Mill in Clarendon so well that it withstood the great Flood of 1927 — as did two of his Pittsford bridges, despite being washed off their foundations.

In 1866, Powers went to Perryville, MD, to work on a 4,700-foot, multi-span railroad bridge. After a tornado destroyed the first attempt, and the college-trained engineers couldn't come up with a better design, Powers was asked if he could devise one.

He looked at his watch. It was 9:45 a.m. "I'll give it to you after lunch," he replied.

By then, he had covered the sides of a timber block with drawings and calculations, and got the job. His crew of 500 completed the work in time for him to win a $500 bonus, with his 16-year-old son Charles designing the drawspan.

But his greatest triumph came in 1855, when he was asked to build a bridge across Schoharie Creek in North Blenheim, NY — a task that meant crossing 210 feet of water with a 232-foot, two-lane span. Powers devised a plan never used before or since, featuring three large Long-style trusses and an solid oak arch down the center of the bridge that North Blenheim residents now call "The Rainbow."

"Powers' Folly," the sidewalk superintendents sneered, predicting it would crash into the creek as soon as the trestle-bridge-like temporary scaffolding beneath it was removed. Powers climbed onto the roof and announced, "If she goes, I'll go with her!" His bridge, the world's longest wooden span, stands to this day though it no longer carries traffic.

Today, this Paul Bunyanesque figure (Allen writes that Powers was reputed to have built all the Town lattices in Vermont and most of those in New England and New York) is nearly forgotten in his home state, the main exception being Pittsford, where the historical society celebrates his career in their museum. When the contents of his former home in Clarendon were auctioned off in 1993, most of his prized tools were either sold or given to North Blenheim, where the Blenheim Bridge Historical Society has honored Powers over the years.

Bridging Past and Present

To be fair, there are Vermont covered bridge sites so obviously the result of community care that the heart leaps for joy. There have been community efforts like Grafton's, where they raised over $100,000 to save the Kidder Hill Bridge.

But after visiting all the bridge sites, I have to report that there are too many bridges closed after long neglect, or being pounded into oblivion by excess loads, or steadily losing strength. Privately owned bridges are especially endangered because they aren't eligible for federal or state funding, even though they are much-visited public resources.

David Wright, a Westminster resident who heads the National Society for Preservation of Covered Bridges, said the society was formed in 1947 to help counteract the trend to simply destroy old bridges during highway construction. Visitors to Vermont's covered brides often see cards left by bridge society members, asking that the society be alerted if a bridge is in danger — something Wright said has saved many bridges in the past.

Now, he said, the battle is over how to preserve them. Vermont has witnessed battles over putting in skylights (the Lincoln Bridge in Woodstock), adding Glulam timbers (the Cornish-Windsor Bridge in Windsor), putting steel beams under wooden bridges (the Chiselville Bridge in Sunderland) and replacing old with new timbers (the Henry Bridge in Bennington).

"I won't say that (the Agency of Transportation) has done more damage than the 1927 Flood, but I'm tempted," concluded Wright. "I've read more foolishness in engineering reports on historic structures than almost anywhere else."

From the Agency's standpoint, Lathrop said, "We don't have a lot of expertise, at least in the department, on covered bridges." That's why an outside consultant did the recent survey and made the recommendations on whether particular bridges should be moved or rebuilt, he said.

But one thing the state agency does know is that "people don't use any common sense. They beat them to death and then say, `Why don't you fix it again?'" Lathrop said. "It's frustrating."

But newly rebuilt covered bridges are different, Lathrop acknowledged. After the aforementioned Town lattice bridge exploded in Rockingham, the trucking company's insurance paid for a new bridge, by Graton Associates. "That thing would probably take a Sherman tank," he said.

I've come to believe there could be a synergy between building more wooden bridges, thereby supporting a corps of skilled bridge-builders, thus justifying long-term forestry management practices, all of which would enhance both tourism and a sense of local identity.

The danger of arson can be eliminated, Wright said, by using a new fire prevention product called Nochar Fire Preventer, that is invisible, non-toxic, easily applied, and costs about $30 gallon.

I have also concluded that this state needs a covered bridge museum: not just a building with exhibits, but also a site that could become a home for homeless bridges. By that, I especially mean the former highway bridges that were literally put out to pasture because people wanted to save them from destruction, not because they wanted to shoulder the burden of maintaining them.

Such a site could also be a testing and demonstrate facility for towns wondering whether wooden bridges are strong enough, or whether fire protection materials really work. Commercial bridge-building companies would probably be willing to market their capabilities at such a center, and help fund it in the process.

To operate such a central clearinghouse, there ought to be a Vermont Society for Covered Bridges, similar to the national society, the society in New York State, and the groups that used to exist for New Hampshire and for the Connecticut River Valley.

My initial thought was that one of the farms perpetually preserved by a land trust might make an ideal site for such a museum. If there were a classic barn, its timber-framed interior would be the ideal environment for interpretive displays.

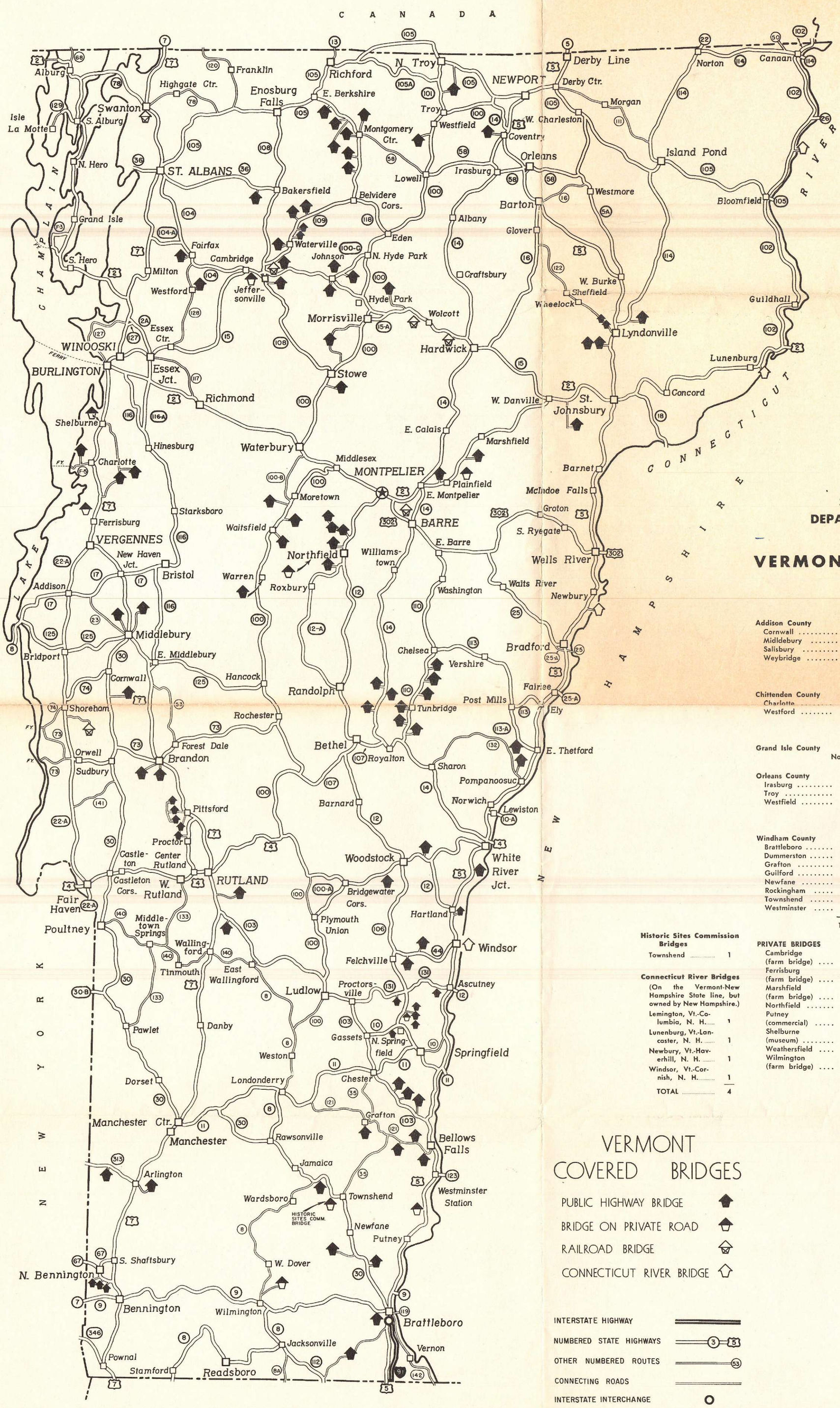
Karen Seward, a Powers' descendant, pointed out that the ideal location might be the old Nicholas Powers farm in Clarendon, where his brick house remains. Three Powers descendants own the land, the house is not occupied, and there is a barn big enough for exhibits, she said.

Jan Lewandoski suggested building examples of all the different bridge types, not only for tourists, but so school groups could come and learn firsthand about that aspect of Vermont history.

My Elderhostel students, who come from all over the country, are good examples of the people who would flock to such an attraction. For them, the environmental and social and engineering and historical aspects of wooden bridges tended to blend into a single word: values.

Helen Crane, of Winchester, MA, wrote that "In these days of conspicuous consumption and a throwaway society, covered bridges provide a safety net for values."

Don Cargo, of Brighton, Michigan, wrote that "For me, the covered bridges of Vermont provide part of a window to the past when life was slower, work was harder, and our our `four freedoms' were truly appreciated and not taken for granted. The bridges remind us of perhaps better times in a way, and could/should help us refocus our individual and collective effort to reach out, grab and hang onto those values that our country is based upon." VSM



2-'56

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
MONTPELIER

VERMONT COVERED BRIDGES

March 15, 1960

PUBLIC HIGHWAY BRIDGES

Addison County	
Cornwall	½
Middlebury	1½
Salisbury	½
Weybridge	½
	3
Chittenden County	
Charlotte	3
Westford	1
	4
Grand Isle County	
	None
Orleans County	
Irasburg	1
Troy	1
Westfield	1
	3
Windham County	
Brattleboro	1
Dummerston	1
Grafton	1
Guilford	1
Newfane	1
Rockingham	5
Townshend	1
Westminster	1
	12

Bennington County	
Arlington	1
Bennington	3
Sunderland	1
	5
Essex County	
	None
Lamoille County	
Belvidere	2
Cambridge	2
Hyde Park	1
Johnson	3
Morristown	1
Stowe	1
Waterville	3
	13
Rutland County	
Brandon	2
Clarendon	1
Pittsford	4½
Proctor	½
Shrewsbury	1
	9
Windsor County	
Hartland	2
Springfield	1
Weathersfield	5
West Windsor	2
Woodstock	2
	12

Caledonia County	
Danville	1
Lyndon	5
	6
Franklin County	
Enosburg	1
Fairfax	1
Fairfield	1
Montgomery	6
	9
Orange County	
Chelsea	1
Randolph	3
Thetford	2
Tunbridge	5
	11
Washington County	
East Montpelier	1
Fayston	1
Marshfield	1
Northfield	5
Waitsfield	3
Warren	1
	12

TOTAL 99

(NOTE: A ½ bridge is one located on a town line.)

Historic Sites Commission Bridges

Townshend	1

Connecticut River Bridges

(On the Vermont-New Hampshire State line, but owned by New Hampshire.)

Lemington, Vt.-Columbia, N. H.	1
Lunenburg, Vt.-Lancaster, N. H.	1
Newbury, Vt.-Haverhill, N. H.	1
Windsor, Vt.-Cornish, N. H.	1
TOTAL	4

PRIVATE BRIDGES

Cambridge (farm bridge)	1
Ferrisburg (farm bridge)	1
Marshfield (farm bridge)	1
Northfield	1
Putney (commercial)	1
Shelburne (museum)	1
Weathersfield	1
Wilmington (farm bridge)	1
	8

RAILROAD BRIDGES

Montpelier and Barre Railroad	
Between Montpelier and Barre	1
Rutland Railway	
At East Shoreham (discontinued)	1

St. Johnsbury & Lamoille County Railroad	
At Swanton	1
At Cambridge Junction	1
West of Wolcott	1
Between Hardwick and Wolcott	1
TOTAL	6

VERMONT COVERED BRIDGES

PUBLIC HIGHWAY BRIDGE

BRIDGE ON PRIVATE ROAD

RAILROAD BRIDGE

CONNECTICUT RIVER BRIDGE

INTERSTATE HIGHWAY

NUMBERED STATE HIGHWAYS

OTHER NUMBERED ROUTES

CONNECTING ROADS

INTERSTATE INTERCHANGE

Corrected to Mar. 15, 1960

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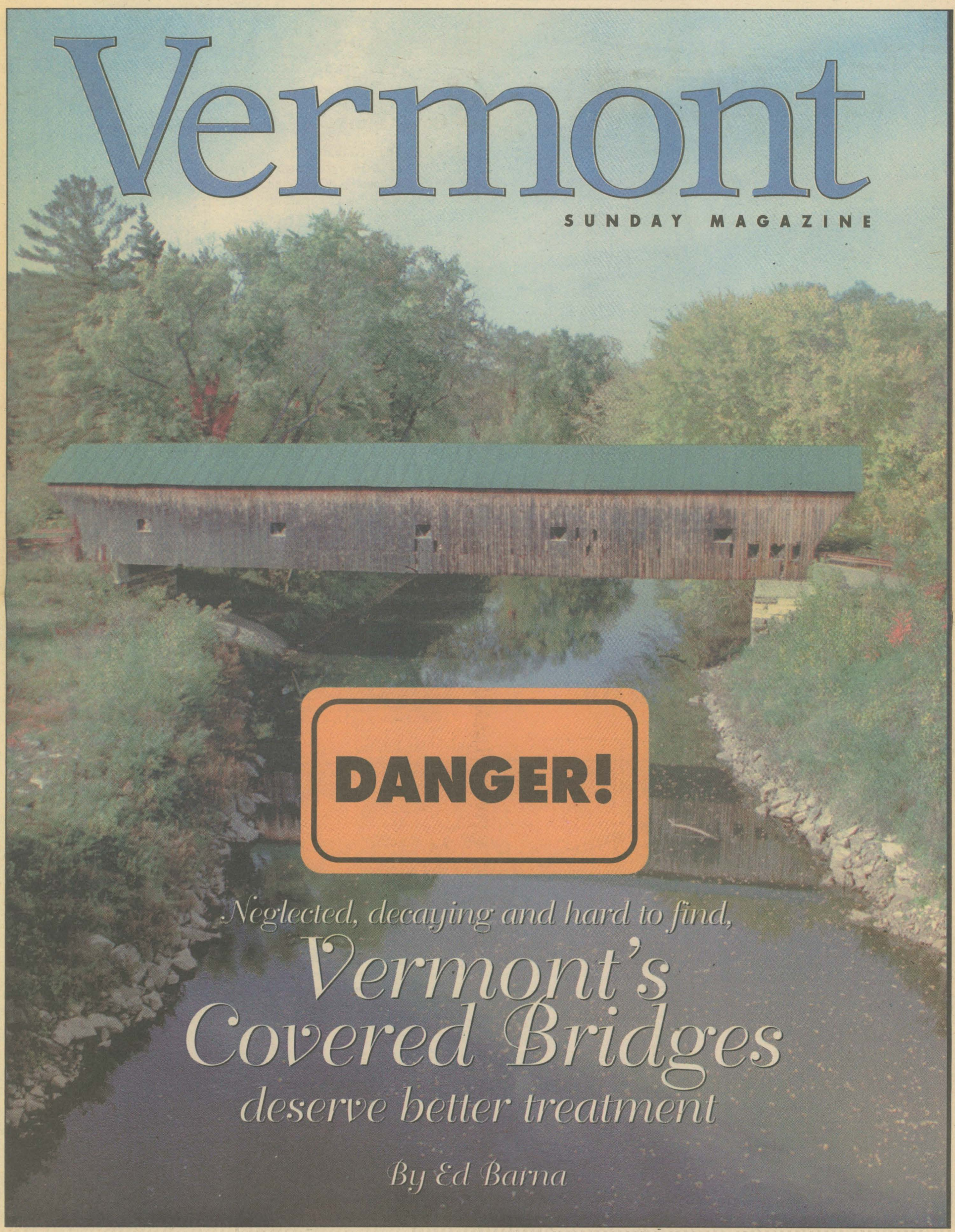
Vermont
SUNDAY MAGAZINE



DANGER!

Neglected, decaying and hard to find,

Vermont's Covered Bridges deserve better treatment

By Ed Barna

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VERMONT SUNDAY MAGAZINE ▼ OCTOBER 15, 1995

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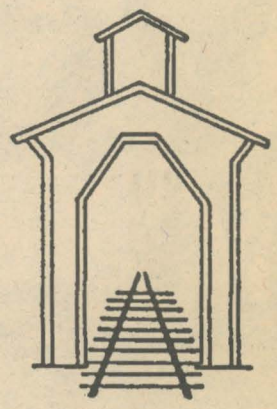
DANGER! by Ed Barna. Vermont is arguably the covered bridge capital of the world, with one for every 79 square miles of land area. So why does the state neglect these homegrown treasures, leaving it to New Hampshire to give these wooden masterpieces of the past their due? The author issues a call for action.



ON THE COVER: *The Hammond Bridge in Pittsford, a Town lattice, was built in 1843 by Asa Nourse. Photo by Ed Barna.*

Books 11

Michael Crichton's formulaic new thriller, *The Lost World*, borrows heavily from *Jurassic Park*. What it leaves out, unfortunately, is the element of surprise.

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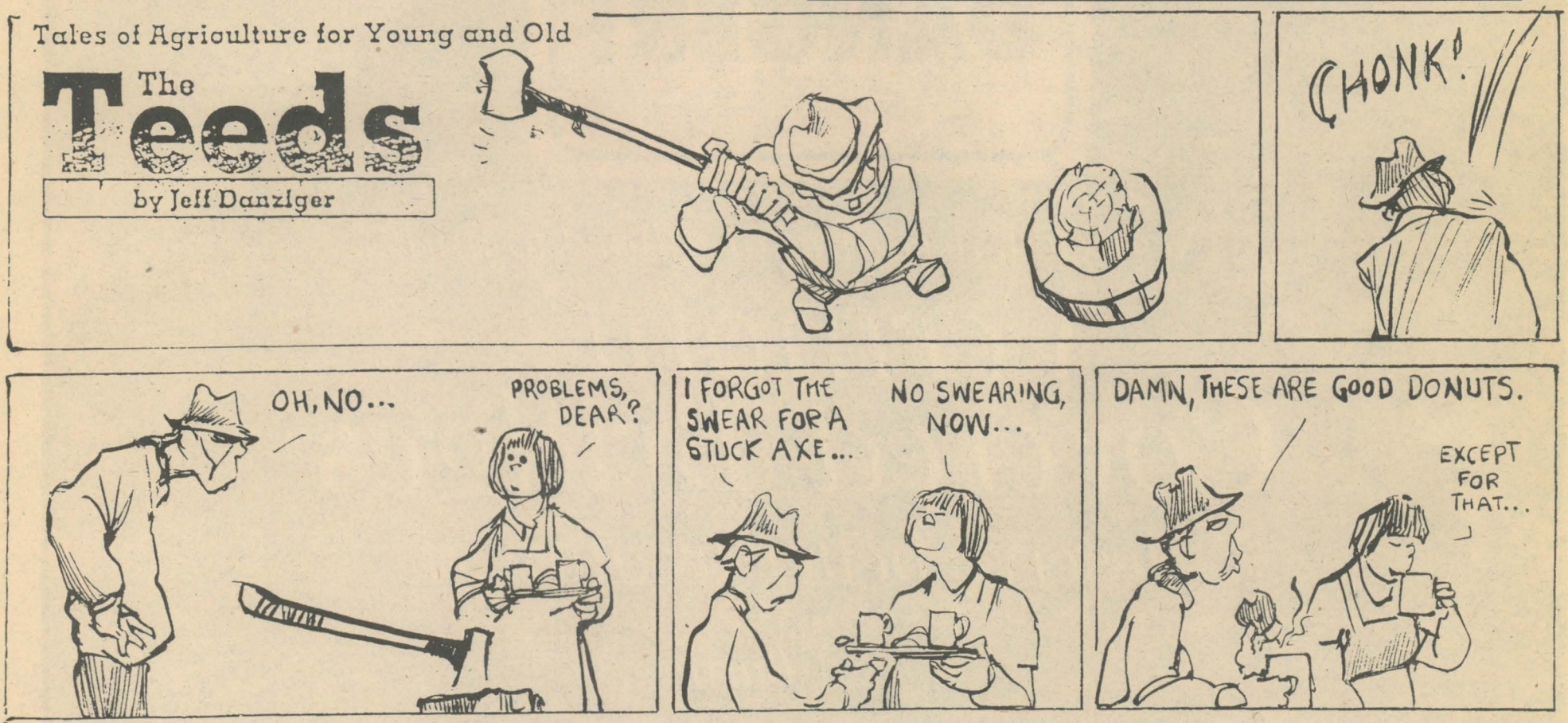


ONCE A FORTNIGHT

The Last of the Summer Vines

BY TIM BROOKES

A good garden season leaves you with little to say, only with tomatoes to can and zucchini to give away. A bad summer leaves you overflowing with a different and more bitter fruit which you also want to give away to anyone who will take it: complaints about the neighbor's dog or the Japanese beetle, tales of wells gone dry or hail a day before harvest.

This year was a good year for sad garden stories. My own began when we moved into the country on July 1 and I began planting, already a month late and in the face of the state's worst drought on record. The soil, at least, was excellent having lain fallow for three years under the sled dog pens put up by the previous owners; I raised mounds and beds and threw in an assortment of the usual seeds, studiously ignoring the plant-by dates on the packets. At the local farm store, already marking down its seedlings, I bought tomato plants like skinny orphans, each one a thin, weak stem four inches high with a pair of flaccid yellowish leaves clinging to the tip. A sprinkler would have flattened them; we had to trickle water from a cupped hand around their wispy roots, like feeding nestlings with a dropper bottle.

We had little enough water anyway: it was our first year on a well, and there was no knowing how long it would last, with the well-drillers truck appearing in one neighbor's driveway after another up and down the valley. Whenever the bathwater was cleanish, I'd leave it standing all day, scoop a gallon or so in the watering can that stood beside the shampoo and the yellow plastic duck and go out to revive another small patch of parched soil.

The torrential rains that left half the state flooded must have arrived at a crucial point in the garden's growth curve, for within a week the earth exploded. The tomatoes, suddenly free of wilt, became thick, dark bushes, merging first with their neighbors and then leaping across from one row to the next to meet one of the other varieties coming in the opposite direction or leaning heavily over the luxuriant but shorter pepper plants like playground bullies, filching their sun.

In August, the windstorm that blew down half of the Adirondack National Forest roared across the valley and toppled everything sideways. The tomato cages were bent almost at right angles where they went into the ground; the pea-and-bean trellis, sheltered by the rest of the garden, abandoned the vertical and began leaning drunkenly on its own vegetation.

We went away for six days and by the time we came back open warfare had broken out. The tomatoes were now a solid hedge five feet tall, under which the peppers, beets and bok choy in the next row had vanished. The pumpkins, cucumbers and squash on the other side had punched through the tomato hedge to reappear three rows away, throwing up their huge, insolent yellow flowers like mouths braying in triumph.

The garden had become a parable of unrestrained development. "Growth! Growth!" the squash family was yelling, galloping in from out of state and trampling everything under its vines, while the foolish lettuce, still crying, "Local control! Local control!" was choked and flattened.

Yet in this thicket of fecundity, something was clearly wrong; we had missed some crucial deadline. We got some 20 smallish zucchini, but our thousand or more tomatoes refused to ripen. The peas flowered and flowered but never podded, and the half-dozen pepper plants barely visible under the tomato jungle produced a single pepper the size of an acorn.

Only the green beans stuck to their task, and at the last possible moment, three days before the first frost hundreds of tiny beans appeared, like green icicles. We ate them off the stem recognizing that this was Nature's token gratitude that we had never, in spite of everything, abandoned the garden.

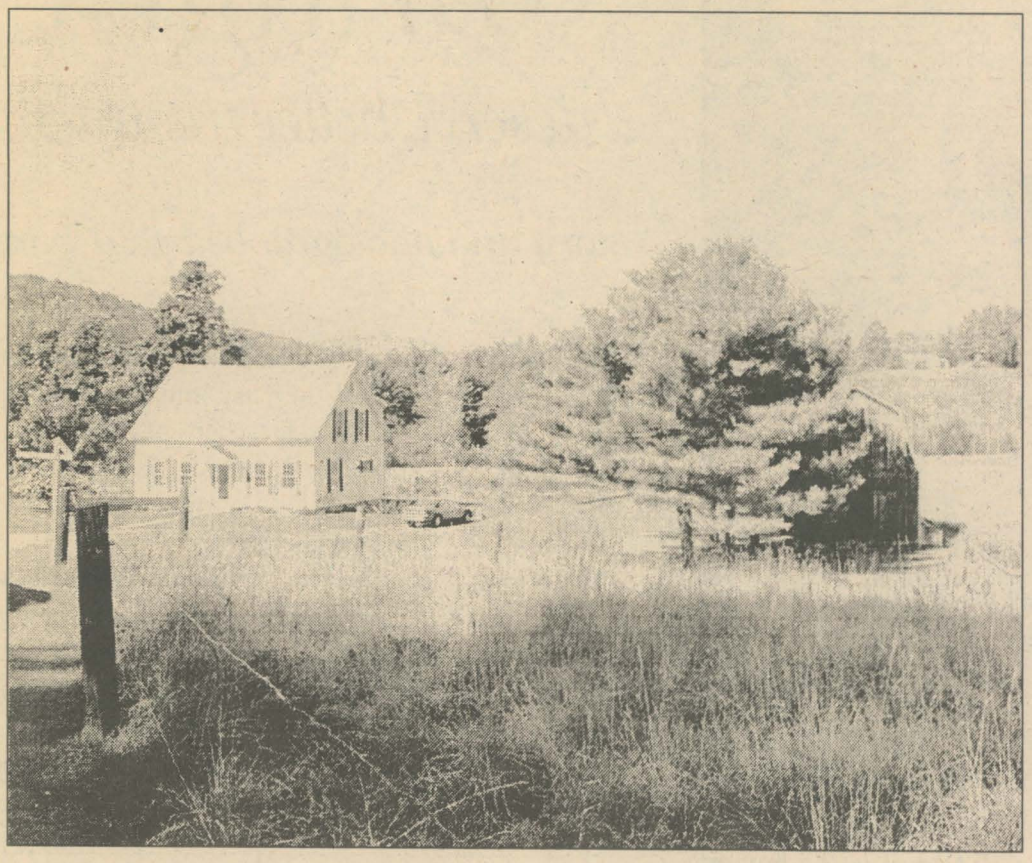
The first frost came early and hard. First all the pumpkin leaves blackened and dropped, and the basil, cucumber and zucchini; then another frost, and another. The tomatoes wilted, their hard green fruit untouched and emerging like false pearls, and the peas and beans looked scarred.

Yet, peering closer, I found that the beans under the broadest leaves had been sheltered, and had been growing with the same desperate enthusiasm that all the vegetables had been showing all summer. Many were now more than six inches long. We picked three dozen or so, steamed them and ate them that night as yet another frost stalked in and a million stars punctuated the lifeless universe.

Tim Brookes is a regular columnist for the Vermont Sunday Magazine.

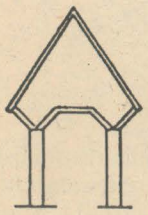
VERMONTSCAPES

BY LINDA SKOVIRA

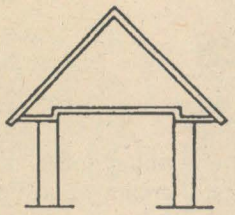


Since 1991, the Vermont Institute of Natural Science, with a statewide membership of 4,200, has been in search of the ideal property for an environmental education center to augment its facility in Woodstock. The VINS board of directors recently decided to purchase for $150,000 the Brown farm on Elm Street in Montpelier for such a purpose. The farmhouse, barn and 28 acres is bordered on the east by the North Branch of the Winooski River, which VINS will use for river study. With a $900,000 annual budget, the organization plans to invest about $300,000 in the property in the first two years. VINS was started in 1969 by local environmentalists on Church Hill Road in Woodstock, where it incorporates the Vermont Raptor Center, an outdoor "living" museum with owls, hawks and eagles. Overcrowded conditions and growing demands for its educational programs necessitated a new center, which could be operational by the first of the year.

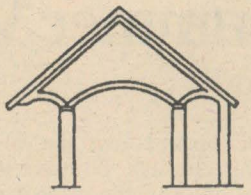
Portal Designs of New England's Covered Bridges



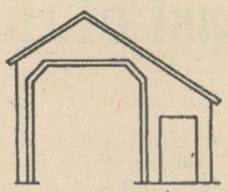
Bennett Bridge
Wilson's Mill,
Maine



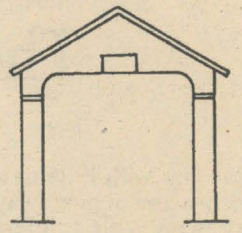
Lovejoy Bridge
South Andover, Maine



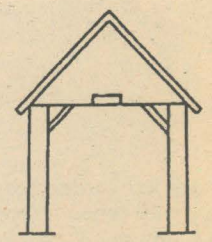
Lyndonville,
Vermont



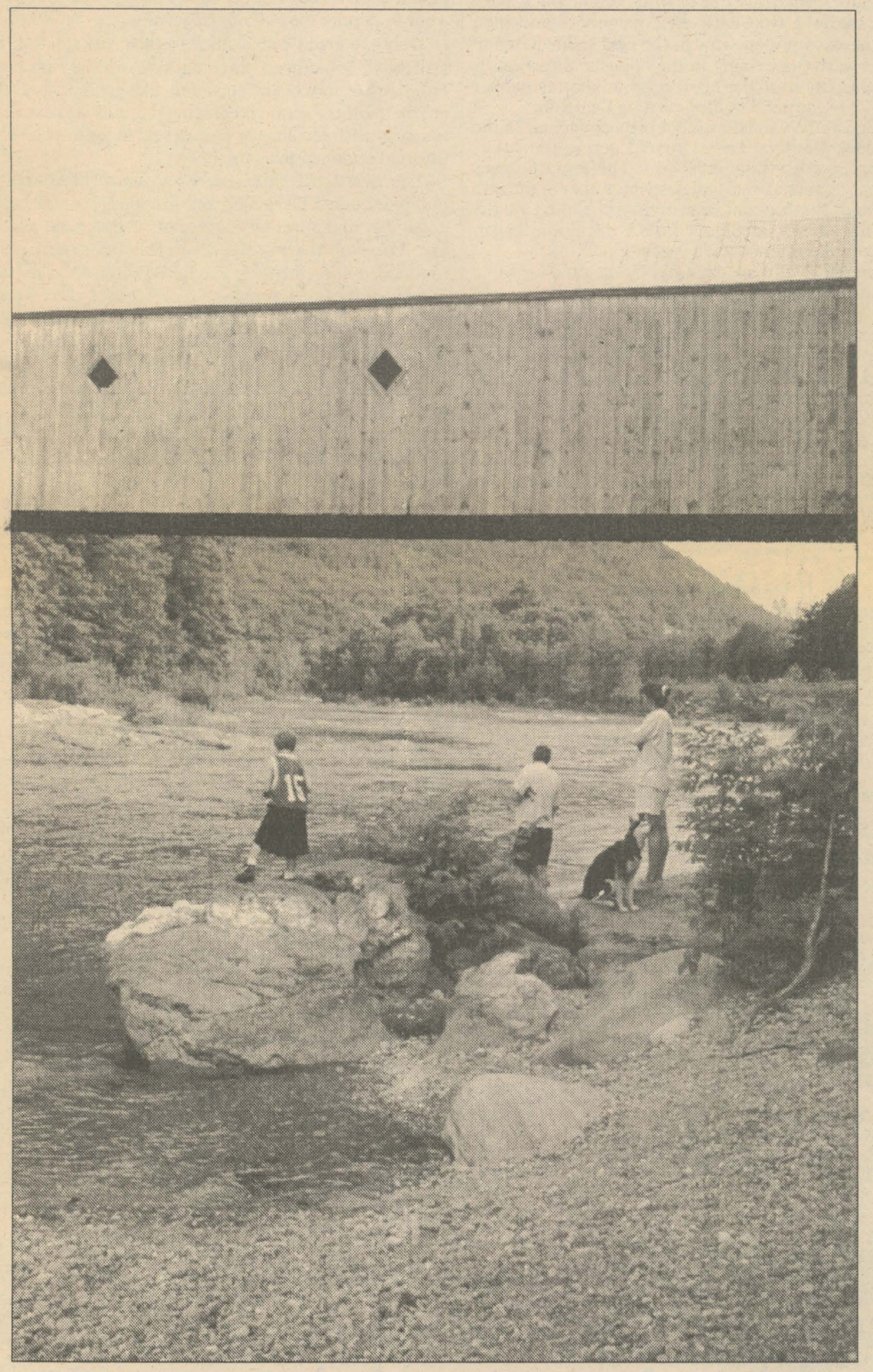
Creamery Bridge
Brattleboro, Vermont



West Cornwall,
Connecticut



Arthur Smith Bridge
Lyonsville,
Massachusetts



A family fishes in the West River at the West River at the West Dummerston Bridge, a two-span Town lattice built in 1827 by Caleb Lamson. At 280 feet, it is the longest covered bridge entirely within Vermont.

DANGER!

Neglected, decaying and hard to find, Vermont's Covered Bridges deserve better treatment

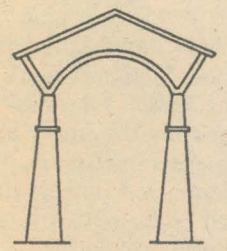
Story and photographs by Ed Barna

When I tell people that I spent much of the past summer taking pictures for a book on Vermont's covered bridges, I'm often asked, "Did you meet any lonely farmwives?"

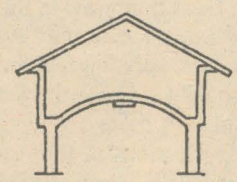
The reference is of course to the runaway bestselling romance *The Bridges of Madison County*, which begins with *National Geographic* photographer Robert Kincaid's quest for covered bridges and leads to a brief but passionate affair with his guide.

"No," I reply, "but I've met a lot of lonely covered bridges."

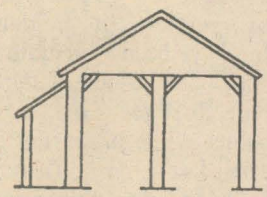
Ed Barna is a free-lance writer.



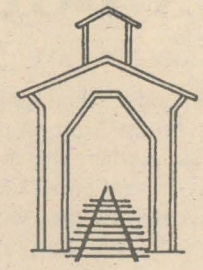
East Shoreham, Vermont



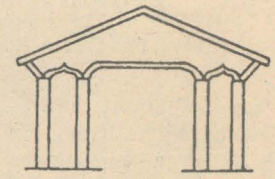
Albany, New Hampshire



Museum Bridge Shelburne, Vermont



Hardwick, Vermont



Asuelot, New Hampshire

My reply is both flippant and serious. As the summer wore on, I came to feel that Vermont treats these priceless, irreplaceable treasures poorly in comparison with other states like New Hampshire and New York.

There seem to be serious shortfalls in conserving the bridges, in educating the public as to why they matter, in promoting them as tourist attractions and in planning for their future.

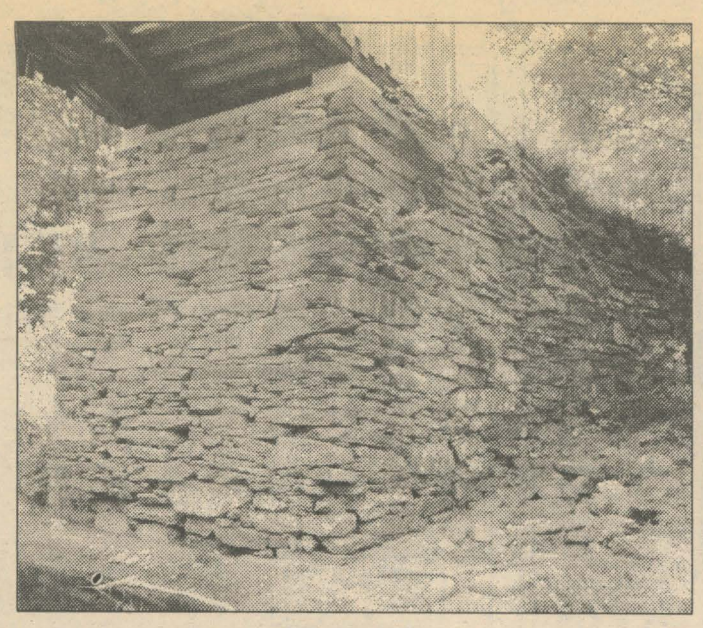
Nor was I alone in this opinion. Covered bridge restoration experts, historic preservation officials, relatives of former bridge builders, and people living near bridges all seconded the conclusion that at a time when so-called heritage tourism seems to be burgeoning, Vermont is overlooking major assets.

At the same time, it seemed as if some sort of awakening might be in progress. The book I was working on, for one of Vermont's publishers, turned out to be only one of several such efforts to produce, for the first time, a useful guidebook.

The Agency of Transportation had been conducting a major study of the state's covered bridges, and was taking greater account of preservationists' recommendations. And everywhere I went, those who lived near the bridges reported a steady traffic of photographers, artists, and other sightseers.

While I'm still frustrated by what I see as less-than-adequate care for covered bridges, I find it hard to blame anyone. I myself am a classic example of a native Vermonter who never appreciated them while growing up, and has only slowly come to understand their true significance.

It's been a memorable summer, with treks through the almost visionary landscape of far northern Vermont, unexpected natural wonders like the day yellow swallowtail butterflies congregated near every bridge, idyllic scenes at bridgeside swimming holes, and hours spent in a dreamlike state. But of all the joys, the greatest has been reaching across the centuries to a greater respect for what the early Vermonters and their Yankee contemporaries accomplished with wood. I have come to believe not only that it is worth the cost of maintaining historic covered bridges, but also that it is practical and economical to build more of them, especially now that global warning and ozone depletion have shown us the need for a more sustainable way of life.



This fieldstone abutment at the Downers Bridge in Weathersfield is one of the finest dry stone bridge foundations in the state.

By the Light of the Burning Bridge

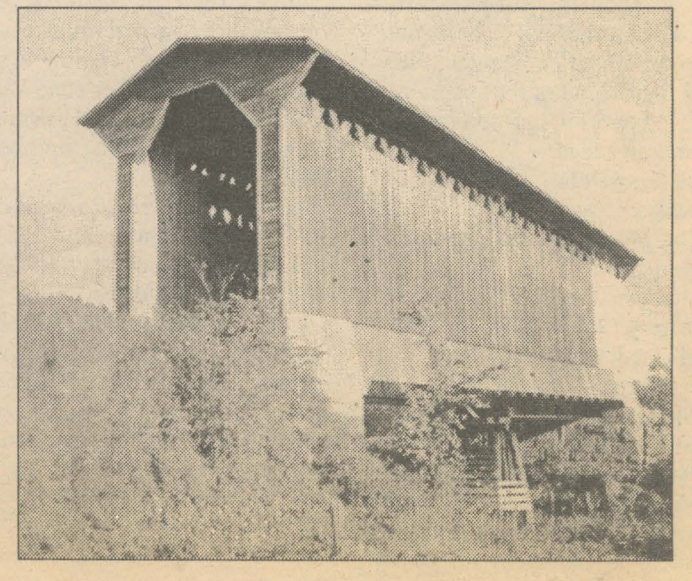
Growing up in and around Brandon, I took the area's dozen or so covered bridges for granted, like so much of the state's beauty.

Living in New Hampshire after college, a kind of turning point came through a close friendship with Richard J. Ducey, who has worked at various times as an antiques dealer, furniture refinisher, barn mover and house builder. A collector of antique hand tools, he brought to life something my history books hadn't covered: what I now think of as America's Great Age of Wood.

Shipwrights, wainwrights, wheelwrights, millwrights, coopers, cabinetmakers, carpenters — these men understood fine details of selecting, sawing and joining wood that modern factory production has largely bypassed. Ducey collected and kept in use hundreds of hand-made planes, each with a special purpose and each necessary to reproduce antique woodworking.

Particularly, the old-timers understood timber framing, or post-and-beam construction, as it's also called. To put together clipper ships, steepled churches, and New England's classic barns, they eschewed nails, favoring braced and pegged all-wooden joints.

Ducey told me stories of the fantastic strength this type of integrated, unitary construction brings to buildings. In one case, he said, a wrecking ball was brought in to demolish a colonial-era house — and bounced off, forcing the crew to do their dirty work by hand.



The Fisher Bridge in Wolcott is one of two covered railroad bridges remaining in Vermont. A steel I-beam now reinforces the wooden timbers.

But my real appreciation of timber-framed bridges began, regrettably, with the saga of the burning of Dean's Bridge in Brandon in 1986. Some of the disaffected youths who were hanging around the town (this from a reliable police source) decided a good prank would be to pour gasoline on the 133-foot structure and set it ablaze.

The town then had to decide what should replace the historic bridge. A strong faction advocated a new covered bridge. A bridge builder from Ashland, NH, named Milton Graton was ready and willing to erect one for less than $100,000, and insisted it could carry an adequate traffic load. Graton had already shown it could be done by building a covered bridge in Woodstock in 1969. Not only had he used historic methods of construction, he had insisted on using oxen to tow the completed bride into place.

But state and federal funds wouldn't apply to such a venture, so the town's share of the cost would be less with a concrete-and-steel bridge. Truckers and farmers favored a stronger bridge, and others didn't want to waste money on something that could be torched again. It took a verbal conflagration at town meeting to decide what to do. In the end, a million-dollar concrete-and-steel bridge spanned Otter Creek — and today, I'm ashamed to say I voted for it.

In a parallel career, I began teaching courses for Elderhostel, a nationwide program which combines mini-courses and vacation stays for senior citizens. Two years ago, Jerome Wyant, a dean at the College of St. Joseph, had the idea of an Elderhostel course on covered bridges, and asked if I would teach it. I jumped at the chance, and plunged into the research literature.

The Covered Bridge State

Almost from the start, it was a schizophrenic experience. On one hand, there was plenty of material on covered bridges in general, largely due to the research and writings of Richard Sanders Allen, Herbert Wheaton Congdon, Eric Sloane, and the

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COVERED BRIDGE

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American Society of Civil Engineers, all nearly a half century ago.

There was lore about their roles as "kissing bridges" (somewhat like walking under mistletoe), wishing bridges, childhood playhouses, and even sites for town events such as church suppers and political rallies.

But finding up-to-date information about Vermont's bridges proved unexpectedly difficult. One of my first actions was to call the Division of Travel and Tourism to get a list of the state's covered bridges. They didn't have one. Try the Division for Historic Preservation, they suggested. The DHP list turned out to be an outdated promotional handout, listing many bridges that no longer existed and missing several that had been added.

The official state highway map had covered bridge symbols on it, but these faint blue marks often bore no relation to the actual location of the bridges. Worse yet, many bridges weren't indicated, especially if they had been closed to traffic.

Had it not been for a couple of commercial road atlases, I would never have been able to find the bridges. But even there, problems abounded: covered bridge symbols on the wrong side of the road, cryptic directions, absent bridges, town names mixed up with village names, no-name roads, all leading to wild goose chases.

Knowledgeable local informants were just as hard to find, especially in remote areas of the Northeast Kingdom. A surprising number of residents had no idea how many bridges were in their towns, let alone where they were. At least my frustration was mitigated somewhat by the evident need for the book I was preparing.

The official disorganization seemed odd because Vermont is clearly the nation's leading covered bridge state. There isn't an up-to-date bridge census that I know of, but back in 1954, Allen counted 390 in Pennsylvania, 349 in Ohio, 174 in Indiana, 149 in Oregon, and 121 in Vermont.

Dividing the number of bridges into the number of square miles in each state, Vermont's 79 square miles beat out Pennsylvania's 116 for first place. Even if no other state had lost a single bridge in 41 years, Vermont would still be number one.

Iowa? With 56,275 square miles, it had 13 bridges in 1954, or 4,328 square miles per bridge. As I tell my Elderhostelers, if you're looking for lonely farmwives, go to Iowa; if you're looking for covered bridges, come to Vermont.

But Vermont itself has yet to realize what it has. How often have you seen an ad proclaiming us the covered-bridge heartland of America?

This pattern of neglect wouldn't have been so irritating had I not taken a look at some covered bridges in New Hampshire while preparing to lead a tour last summer. There, I found state highway signs pointing the way to the bridges, and well-designed and maintained parking places for visitors. Each bridge was numbered for reference to maps or to a lavishly illustrated state highway department guidebook, and each site had an interpretive sign. The contrast with Vermont could not have been more complete.

Heartwood

Covered bridges are some of our best monuments to the old forests of New England, the virgin timberlands whose tallest spires were once blazed with a special mark reserving them as masts for the King's Navy. Wood of the size and quality those forests produced is simply impossible to find today.

The late Milton Graton — whose son Arnold and nephew Stanley now carry on his bridge-building work — wrote a book that helped explain the difference. Trees that grow in the middle of a dense, naturally evolving forest have very few side branches (the light is above them, not to the side) so there are few knots or imperfections in the resulting timbers. They grow very slowly, putting on small annual rings, so the wood is extremely dense.

Allowed to survive for centuries, such trees become so thick that timbers can be cut entirely from heartwood, rather than including the softer, outer sapwood. One reason some covered bridge timbers show the marks of hand hewing is that the trees were too large to be taken to a sawmill and had to be shaped into square timbers with an adze where they fell.

The U.S.S. Constitution was called "Old Ironsides" because its builders chose such old-growth oak trees for its outer planks (this from Eric Sloane) that cannonballs literally bounced off.

That's the sort of wood in the bottom chords, as they are called, that carry most of the weight in covered bridges, though it is spruce, hemlock or pine rather than oak. David Lathrop, the Agency of Transportation's engineering section supervisor, said one reason the state bridge designers sometimes specify glue-laminated timbers during covered bridge repairs — to the consternation of purists — is that the same type of wood isn't available any more.

Much of my education came through Jan Lewandoski of Stannard, who has built three covered bridges, including one in Vermont at Kent's Corners, and has repaired many of Vermont's classic bridges. He said that engineering schools have put the designs of century-old covered bridges though computer programs, only to learn that, theoretically, the bridges should have collapsed of their own weight. But the strength values used in the software programs are based on regrowth woodlands, not virgin forests.

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COVERED BRIDGE

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It is possible to replace each part of a covered bridge one by one as problems appear — a sharp contrast with metal bridges, which are more subject to catastrophic failure. Indeed, this is one advantage cited by those who advocate building more of them.

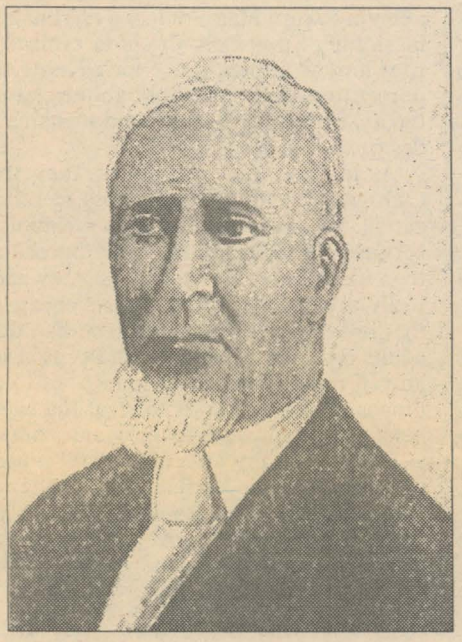
But that sort of interchangeability shouldn't become an excuse for neglect. The original timbers are national treasures, and I believe the state should take a greater role in assuring that the roofs of covered bridges don't leak and deteriorate them.

In Truss We Trust

Important as straight, dense, and knot-free beams were to the early bridge-builders, the designs were of even greater significance. Another reason Vermont's covered bridges matter is because they symbolize one of history's leaps forward: the unparalled revolution in wooden bridge-building techniques that took place in the first half of the 19th century.

As steel began to replace wood later in the 19th century, the bridge designers drew on the work of wooden-bridge designers. Ironically, those metal bridges are now more at risk than the covered bridges, according to the Division for Historic Preservation.

There had been covered bridges in Europe, where timber-framing helped build the great cathedrals. An Italian architect named Palladio had sketched out four ideas for wooden bridge trusses as early as the 16th century. But for lack of trees, and because most of the rivers were already crossed with Roman-style stone arch bridges, Palladio's ideas remained uninfluential — until they arrived in 18th century America. With the Revolutionary War won, there was a need to bridge many rivers and open up the new country, and the presence of immense forests suggested a way.



Nicholas M. Powers

It was in Vermont, at Bellows Falls, that Col. Enoch Hale in 1785 built a 365-foot, two-span (shore to island to shore) wooden bridge that opened many people's eyes, as well as opening up Vermont to trade with the Boston market. Although it wasn't covered — an 1804 Timothy Palmer bridge in Philadelphia began that trend — Hale's bridge is acknowledged to be the one that started the surge of design work by showing wood was capable of spanning large rivers.

Here, it is necessary to talk a bit about bridge engineering. In a covered bridge, the sides do the work, not the floor, and certainly not the roof, which is only there to keep the rest of the wood dry so it won't rot.

Each side of a true covered bridge is a truss, a unified combination of architectural members. The truss spreads the stress from the bridge's weight, in effect shifting the load to where the ends of the truss rest on streamside abutments.

It would be possible to make one huge timber out of many boards for each side, but that would weigh too much. (Modern "stringer" bridges do something similar by using huge steel I-beams as the bottom stringers, and get away with it because steel is so strong in proportion to its weight.)

But a wooden truss acts like a gigantic plank standing on its side, creating an integrated structure that weighs much less that a solid, laminated board would because of all the empty spaces in the design.

The arrangement of the timbers is the key, because a good design takes advantage of wood's great strength when force is not applied across the grain. The most remarkable examples of this come from engineering schools and Odyssey of the Mind competitions in which contestants create covered-bridge-like structures out of less than a pound of balsa wood. These airy, seemingly flimsy balsa wood tunnels withstand almost miraculous weights before they are crushed during the judging.

Once I understood something about their design, covered bridges seemed more resourceful than rudimentary, more ingenious than improvised. The concept was particularly important during the 1800s — an expansionist time when all sorts of schemes were hatched for roads, canals and, later, railroads. Anyone who could devise and patent a quicker, easier, cheaper way of building a stronger wooden bridge stood to reap immense royalties from the invention.

First there was self-taught architect and house-builder Timothy Palmer, born in Massachusetts, who in 1797 took out a patent on an arched truss he used to span major rivers like the Potomac, Schuykill and Delaware. But his Palladio-style designs had one great deficiency: the traveler had to go up and down, up and down, to cross a river.

Theodore Burr, who learned timber-framing from his Connecticut millwright father, took the next step, adapting a Palladio design into a combination of arches and multiple kingpost trusses (see diagram). In 1817, he patented the Burr truss, which had a level roadway, a design that was a prototype for thousands of bridges, including the first Vermont covered bridge (now gone) in 1824 at Highgate Falls.

But the real leap forward, one that had no precedent in Europe, came in 1820 when Ithiel Town, a Connecticut architect and builder, patented his "Town lattice mode," with the double lattice (see diagram) patented in 1835. Using criss-crossed diagonal planks rather than massive timbers, it was easier to build and phenomenally strong.

Eric Gilbertson, the head of the Division for Historic Preservation, said he knows of only one instance in which a Town lattice truss failed in Vermont, as opposed to the floorboards giving out. A trucker tried to run it with an illegal load, heard the timbers cracking, got out and ran. Had he kept driving, the bridge would have survived, Gilbertson said. But as it was, "the bridge literally exploded. There were pieces scattered from hell to breakfast," due to the even distribution of stresses.

Most of Vermont's bridges are Town lattices, a name that sometimes misleads people into thinking they were called that because towns built them. It was said that the Town lattice could be "built by the mile and cut off by the yard," a statement that almost literally came true in this century when a developer bought a disused bridge in Cambridge, Vermont and moved half to South Pomfret and half to Weathersfield to become housing project entrances.

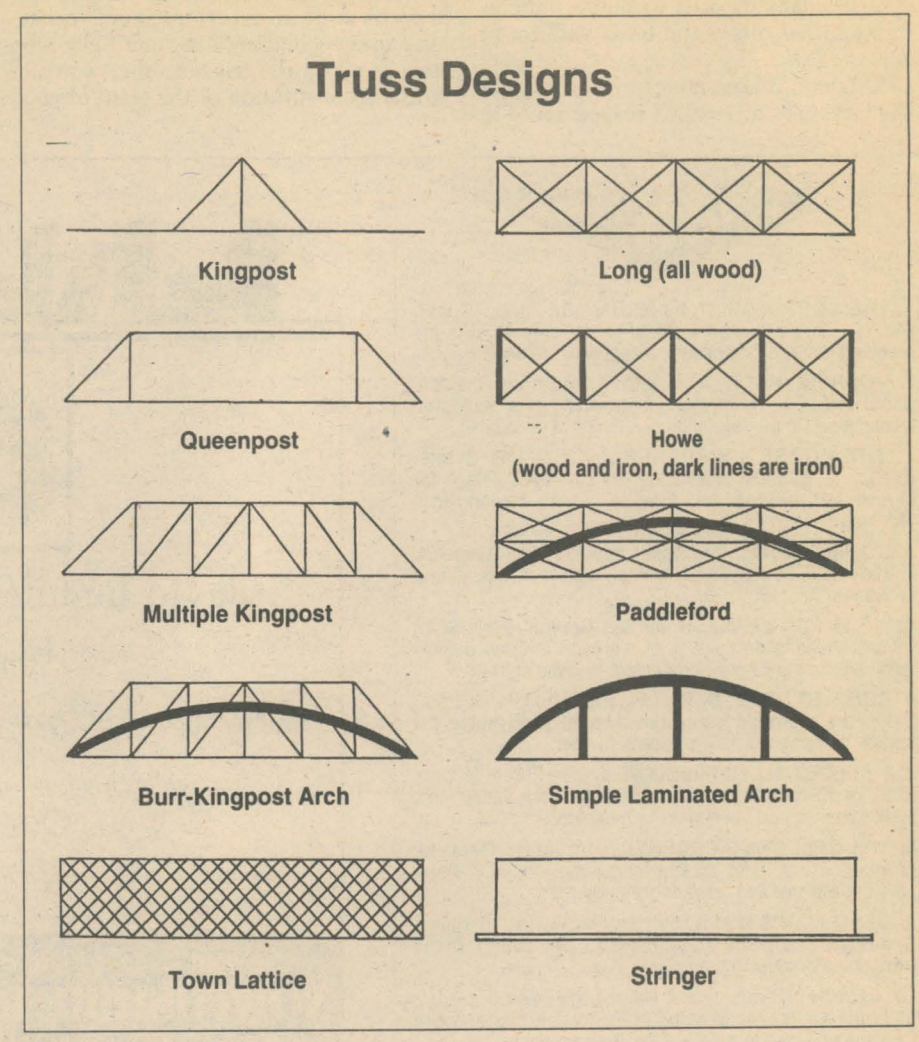
In 1830, Town found a major competitor in New Hampshire-born Army engineerCol. Stephen Long, who patented a truss with boxed X's. But after 1840, both men were succeeded by William Howe of Spencer, Mass., who solved the weakness in covered bridges — the tendency of vertical stress to overcome the wooden joints — by substituting vertical iron rods (giant nuts and bolts, in effect) for the vertical timbers in a design similar to Long's.

Both Howe and Town trusses were built into the 20th century, with Howe's design especially important to railroads because it could be pre-manufactured and shipped in kit form. Proponents of building new covered bridges point to the way these structures carried locomotives, which weighed 60 tons or more.

There were other gifted builders who never patented trusses. Among these was the man often thought to be the greatest of them all: Nicholas Montgomery Powers.

A Legend in His Own Time

Born in 1817 in a log cabin near Pittsford, Powers was the son of a wheelwright and builder. He quickly showed an aptitude for mathematics and model-building, worked



Robert Wood, a grandson of Nicholas Powers, holds a model Powers created for an experimental truss that Powers never had a chance to construct. Behind him is Pittsford's Cooley Bridge, built in 1849.

with local bridge builder Abraham Owen, and at the age of 19 successfully proposed building a covered bridge where Route 7 now crosses Furnace Brook near its junction with Route 3.

His father had to sign an agreement with the selectmen to pay for any timbers young Nicholas spoiled. But the bridge was strong enough to last 96 years and carry the weight of a 20-ton steamroller that the state crew had brought to help build a modern bridge at the site in 1931.

His reputation spread, and not just as a bridge builder. He moved the spire on the Rutland County Courthouse to the front of the building where it is today, erected West Rutland's first marble quarry derrick, constructed numerous barns, and built the Kingsley Mill in Clarendon so well that it withstood the great Flood of 1927 — as did two of his Pittsford bridges, despite being washed off their foundations.

In 1866, Powers went to Perryville, MD, to work on a 4,700-foot, multi-span railroad bridge. After a tornado destroyed the first attempt, and the college-trained engineers couldn't come up with a better design, Powers was asked if he could devise one.

He looked at his watch. It was 9:45 a.m. "I'll give it to you after lunch," he replied.

By then, he had covered the sides of a timber block with drawings and calculations, and got the job. His crew of 500 completed the work in time for him to win a $500 bonus, with his 16-year-old son Charles designing the drawspan.

But his greatest triumph came in 1855, when he was asked to build a bridge across Schoharie Creek in North Blenheim, NY — a task that meant crossing 210 feet of water with a 232-foot, two-lane span. Powers devised a plan never used before or since, featuring three large Long-style trusses and an solid oak arch down the center of the bridge that North Blenheim residents now call "The Rainbow."

"Powers' Folly," the sidewalk superintendents sneered, predicting it would crash into the creek as soon as the trestle-bridge-like temporary scaffolding beneath it was removed. Powers climbed onto the roof and announced, "If she goes, I'll go with her!" His bridge, the world's longest wooden span, stands to this day though it no longer carries traffic.

Today, this Paul Bunyanesque figure (Allen writes that Powers was reputed to have built all the Town lattices in Vermont and most of those in New England and New York) is nearly forgotten in his home state, the main exception being Pittsford, where the historical society celebrates his career in their museum. When the contents of his former home in Clarendon were auctioned off in 1993, most of his prized tools were either sold or given to North Blenheim, where the Blenheim Bridge Historical Society has honored Powers over the years.

Bridging Past and Present

To be fair, there are Vermont covered bridge sites so obviously the result of community care that the heart leaps for joy. There have been community efforts like Grafton's, where they raised over $100,000 to save the Kidder Hill Bridge.

But after visiting all the bridge sites, I have to report that there are too many bridges closed after long neglect, or being pounded into oblivion by excess loads, or steadily losing strength. Privately owned bridges are especially endangered because they aren't eligible for federal or state funding, even though they are much-visited public resources.

David Wright, a Westminster resident who heads the National Society for Preservation of Covered Bridges, said the society was formed in 1947 to help counteract the trend to simply destroy old bridges during highway construction. Visitors to Vermont's covered brides often see cards left by bridge society members, asking that the society be alerted if a bridge is in danger — something Wright said has saved many bridges in the past.

Now, he said, the battle is over how to preserve them. Vermont has witnessed battles over putting in skylights (the Lincoln Bridge in Woodstock), adding Glulam timbers (the Cornish-Windsor Bridge in Windsor), putting steel beams under wooden bridges (the Chiselville Bridge in Sunderland) and replacing old with new timbers (the Henry Bridge in Bennington).

"I won't say that (the Agency of Transportation) has done more damage than the 1927 Flood, but I'm tempted," concluded Wright. "I've read more foolishness in engineering reports on historic structures than almost anywhere else."

From the Agency's standpoint, Lathrop said, "We don't have a lot of expertise, at least in the department, on covered bridges." That's why an outside consultant did the recent survey and made the recommendations on whether particular bridges should be moved or rebuilt, he said.

But one thing the state agency does know is that "people don't use any common sense. They beat them to death and then say, `Why don't you fix it again?'" Lathrop said. "It's frustrating."

But newly rebuilt covered bridges are different, Lathrop acknowledged. After the aforementioned Town lattice bridge exploded in Rockingham, the trucking company's insurance paid for a new bridge, by Graton Associates. "That thing would probably take a Sherman tank," he said.

I've come to believe there could be a synergy between building more wooden bridges, thereby supporting a corps of skilled bridge-builders, thus justifying long-term forestry management practices, all of which would enhance both tourism and a sense of local identity.

The danger of arson can be eliminated, Wright said, by using a new fire prevention product called Nochar Fire Preventer, that is invisible, non-toxic, easily applied, and costs about $30 gallon.

I have also concluded that this state needs a covered bridge museum: not just a building with exhibits, but also a site that could become a home for homeless bridges. By that, I especially mean the former highway bridges that were literally put out to pasture because people wanted to save them from destruction, not because they wanted to shoulder the burden of maintaining them.

Such a site could also be a testing and demonstrate facility for towns wondering whether wooden bridges are strong enough, or whether fire protection materials really work. Commercial bridge-building companies would probably be willing to market their capabilities at such a center, and help fund it in the process.

To operate such a central clearinghouse, there ought to be a Vermont Society for Covered Bridges, similar to the national society, the society in New York State, and the groups that used to exist for New Hampshire and for the Connecticut River Valley.

My initial thought was that one of the farms perpetually preserved by a land trust might make an ideal site for such a museum. If there were a classic barn, its timber-framed interior would be the ideal environment for interpretive displays.

Karen Seward, a Powers' descendant, pointed out that the ideal location might be the old Nicholas Powers farm in Clarendon, where his brick house remains. Three Powers descendants own the land, the house is not occupied, and there is a barn big enough for exhibits, she said.

Jan Lewandoski suggested building examples of all the different bridge types, not only for tourists, but so school groups could come and learn firsthand about that aspect of Vermont history.

My Elderhostel students, who come from all over the country, are good examples of the people who would flock to such an attraction. For them, the environmental and social and engineering and historical aspects of wooden bridges tended to blend into a single word: values.

Helen Crane, of Winchester, MA, wrote that "In these days of conspicuous consumption and a throwaway society, covered bridges provide a safety net for values."

Don Cargo, of Brighton, Michigan, wrote that "For me, the covered bridges of Vermont provide part of a window to the past when life was slower, work was harder, and our our `four freedoms' were truly appreciated and not taken for granted. The bridges remind us of perhaps better times in a way, and could/should help us refocus our individual and collective effort to reach out, grab and hang onto those values that our country is based upon." VSM

ENJOY THE BEST DINING IN VERMONT .....PAGES 10-17

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VOLUME 26 NO. 41 *Central Vermont's Premier Weekly Newspaper* OCTOBER 10, 1996

Vermont's Magnificent Bridges

NEWS HIGHLIGHTS

Bob Perry Photo

By Ed Barna

Vermont's covered bridges make wonderful excuses to get out and explore the state's back roads, even if the weather or the foliage isn't at its best. Romantic, long before 'The Bridges of Madison County," (they were called 'kissing bridges" due to the mistletoe-like custom of lovers stealing kisses while traveling through their darkened interiors) they convey a traveler back to the days of hill farms with a dozen cows, district one-room schoolhouses and steam engines chugging in the valleys.

To a student of history, they also symbolize the days when wood, not metal or concrete, was the raw material of American growth and development. They were part of the surge that not only settled the country, but also constantly devised new tools and methods to do so—like the ingenious ways in which the sides of the wooden bridges carry such tremendous loads.

Fortunately for a Killington-area visitor, there is good bridge-hunting territory both east and west of Sherburne pass. Rutland County has eight covered bridges, four in Pittsford alone. Woodstock has four, as well, and West Windsor, Weathersfield and Rockingham all have three, not to mention the magnificent Cornish-Windsor Bridge over the Connecticut River.

There won't be room in this article to describe exactly how to get to all the bridges I've mentioned. The official Vermont road map has bridge symbols, but they only give general locations for some of the bridges. The commonly sold road atlas isn't always accurate. The commonly sold atlas and gazetteer has the best list and maps, other than my book, *Covered Bridges of Vermont*, which is available in many convenience stores as well as bookstores.

But after all, what better way to meet Vermonters than to ask directions to covered bridges? If those instructions are a bit vague, well, that's an excuse to meet even more people, right? The best way to go looking for covered bridges is with a sense of humor, without a strict schedule, and with the realization that their out-of-the- way placement

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Weekend Weather Outlook

The remnants of Hurricane Josephine could have an influence on the weekend weather. If the storm moves away quickly we could have more sunshine than predicted in this early forecast.

Friday - Mostly cloudy weather is predicted with high temperatures near 55° and overnight lows around 35°

Saturday - Some sun, but mostly cloudy with high temperatures near 55° and overnight lows around 40°

Sunday - Sun mixed with possible showers, with high temperatures in the mid 50°'s and overnight lows in the mid 40's°

Note: The altitude in central Vermont varies from sea level to over 4,000'. This means that weather conditions can differ WIDELY through the area!

Fall Colors Grace Mountain Valleys

Many areas of the broad Champlain Valley and the mountain valleys throughout the state will show mid-stage to near-peak conditions during the coming week.

Lower elevations, especially the southern portion of the Connecticut River Valley, and along the shores of Lake Champlain vary from early to mid-stage color change.

Northern Vermont: Some leaf drop has begun at the highest elevations of the northern mountains, but valley routes and village centers should be colorful through the coming weekend.

Central Vermont: The color change varies from 60 percent to full color, depending on elevation. The hard freeze late last week appears to have dulled colors on some hillsides, while others remain bright. Suggested mountain valley routes include: Rtes. 302, 25, 110, 14, 12, and 100. Good color is emerging in the Middlebury and Rutland areas. Mid-stage to near-peak conditions are reported also along Rte. 133 from Middletown Springs to West Rutland and bright mid-stage to full colors will be found along Rte. 103.

Southern Vermont: With peak conditions in the high elevations around Wilmington and Mt. Snow, color is brightening in the middle and lower elevations. Rtes. 30 and 11 are showing good mid-stage to near peak colors. Stands of bright color are appearing at lower elevations of the Connecticut River Valley and along Rtes. 7 and 7A in the Bennington and Manchester areas.

The Vermont Fall Foliage Report is updated each Monday and Thursday morning. A recorded report may be heard by calling 1-800-VERMONT. A fax of the report is available by calling VTFAX (800-833-9756).

Covered Bridges

from page 1

Bob Perry photo

is probably the reason they weren't replaced by concrete decades ago.

I've mentioned the bridge between Windsor and Cornish, New Hampshire, because it's one to which covered bridge lovers go as a kind of pilgrimage. Its incredible length, over 400 feet, gives some idea of the enormous, multi-span covered bridges that once crossed tidal rivers near the East Coast early in the l9th century.

Starting with Philadelphia's Permanent Bridge in 1805, the custom of roofing wooden bridges to protect the intricately carved and pegged wooden joints from rotting, spread rapidly. There had been covered bridges in Europe, and some ingenious ideas for wooden bridges from a 16th century architect named Palladio, but it took America's combination of big trees and big rivers to create an explosion in wooden bridge building.

Vermont's bridges came later, in the middle to late l9th century, the Pulp Mill Bridge in Middlebury being the oldest *surviving* example. It was built some time between 1808 and 1820, as best as anyone can determine. One of the frustrations of covered bridge research is that they were so common in their day that few people paid much attention to the fine details of how they came into existence.

Floods destroyed many of them. One of the best ways to begin exploring the area's covered bridges is by visiting the Pittsford Historical Society museum, which is open on Tuesdays. Ask to see their video of the Flood of 1927, which destroyed perhaps 500 covered bridges. Look at their photos of the submerged Gorham Bridge, which is on the Pittsford-Proctor town line, which went downstream in that flood only to be brought back, rebuilt, and put in service again. This gives some idea of how well they were built. The Hammond Bridge, on the truck route from Route 7 to Florence, north of Pittsford, also took such a journey.

Pittsford has the Depot Bridge on Depot Street, which starts at Keith's Country Store on Route 7. And down Elm Street, which starts at Kamuda's Supermarket, there is the much-photographed Cooley Bridge, the creation of famed bridge builder Nicholas Montgomery Powers, which for all the world, looks like a big Conestoga wagon.

Powers also built Rutland County's "hidden" bridge, the Twin Bridge in Rutland Town. Just north of Rutland on Route 7, split off to the right (straight ahead, actually) and just before the bridge, look closely at the town equipment shed on your right. Yup, it's a covered bridge, all right. It used to be across the river, like its twin. But a flood in 1947 that started with a washout of Chittenden Reservoir, knocked them both loose, along with several other former Rutland bridges.

Powers also built the Brown Bridge in Shrewsbury, which can be found by taking Stratton Road south from Route 4 (the MacDonald's intersection) and keeping on past the hospital several miles. The road to the bridge dives down to the left - look for a highway sign saying 8' 11" - which is the bridge's clearance. You'll be rewarded by a riverside picnicking site in a secluded setting which is used as a swimming hole in hot weather. It makes for splendid bridge pictures in snowy weather, but walk down the steep road rather than driving it in snowy conditions.

The Sanderson Bridge in Brandon, where prehistoric Indians used to camp to hunt and fish, and the Kingsley Bridge, not far from Rutland State Airport, complete the list of Rutland County's bridges.

Leaving the bridges below Route 4 for self-guided tours, let's look at the situation around Woodstock which most travelers will find more readily accessible.

There's one bridge that truly fits the description "you can miss it:" the Lincoln Bridge west of Woodstock, which is right next to Route 4. (Incidentally, in almost all cases these bridges were named for a family who happened to live nearby).

Built in 1877, this is the only surviving bridge in the country that used T. Willis Pratt's design for a combination wood and iron bridge. Such hybrid bridges became much more common in the railroad era, which began in Vermont around 1850. Replacing some wooden pieces with iron helped cope with the way stresses sometimes concentrated on particular wooden joints, which of course were not as strong as solid wood.

Advocates of building more covered bridges point to two examples of their practicality: the way they handled heavy loads in the steam train era, and the way the Middle Bridge in Woodstock is functioning. Located a short walk north of the village green, it is, to all appearances, a typical 19th century bridge of the Town lattice design (invented by Ithiel Town of Connecticut).

In fact, a New Hampshire covered bridge builder and restorer named Milton Graton built it in 1969, not only using authentic construction methods, but even pulling it from the meadow where it was built to the temporary scaffolding over the river with his team of oxen.

East of Woodstock on Route 4 is the Taftsville Bridge, one of the state's most unusual covered bridges. Experts have been unable to describe its unique system of bridge timbers with any other term than "mongrel truss." Be careful of traffic on this one, and go upstream if you want a good side shot that doesn't include the power station.

The fourth Woodstock bridge is a homemade job put together in 1981 by handyman Frank G. Lewis to connect two of his back fields. It's 3.7 miles north of Route 4 on Route 12, on the left. Not a prizewinner for length, but a monument to Yankee ingenuity.

Lewis probably would have had a good talk with Nicholas Powers, whose life is also commemorated in the Pittsford museum because he was born in that town. Perhaps the greatest of his feats involved a huge railroad bridge in Maryland, where he had gone as a construction worker at the invitation of a friend he met building a bridge in Bellows Falls. When the first bridge was destroyed by a tornado, no one could come up with a new design strong enough to please the railroad.

Finally, someone asked Powers how long it would take him to design a new bridge. "I haven't had my lunch yet," he said. "Give me until after lunch." Sure enough, by then he had drawn sketches and equations for a bridge. He agreed to head the construction team if he could pick his own 50 men, and eventually led 500 men in completing it ahead of schedule to win a bonus.

But he didn't stay around for the opening ceremony. His wife, back in Clarendon, wrote to say he was needed on the farm, and he had better come back—and he did, never staying out of state to work again.

Richard Sanders Allen, our first and foremost covered bridge historian, has written that at times, Powers was alleged to have built all the Town lattices in New England. He doesn't need that record to be admired - just go to the Cooley Bridge or the Brown Bridge and sense the kind of respect for quality workmanship that was the rule in those supposedly old-fashioned times.

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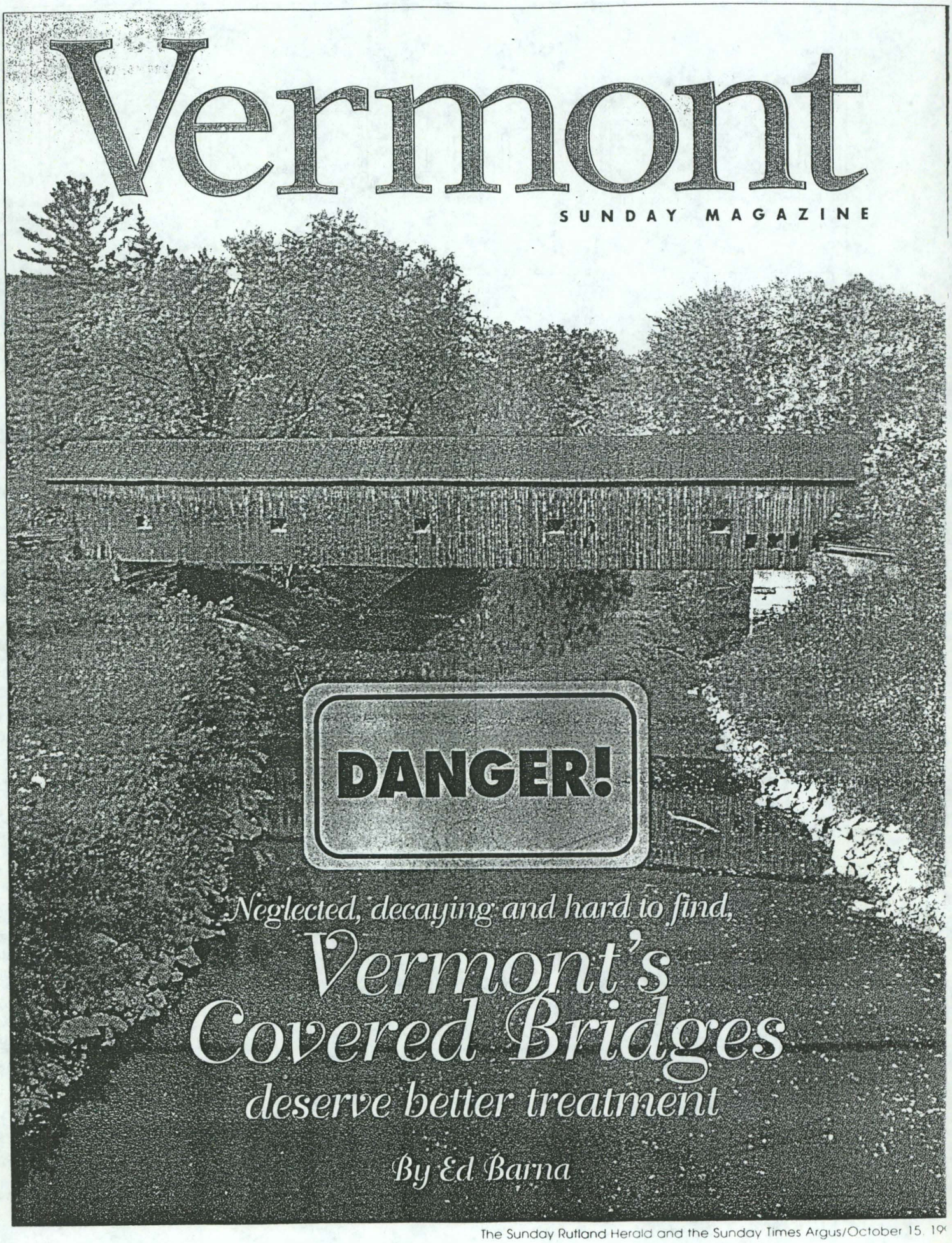
Vermont
SUNDAY MAGAZINE



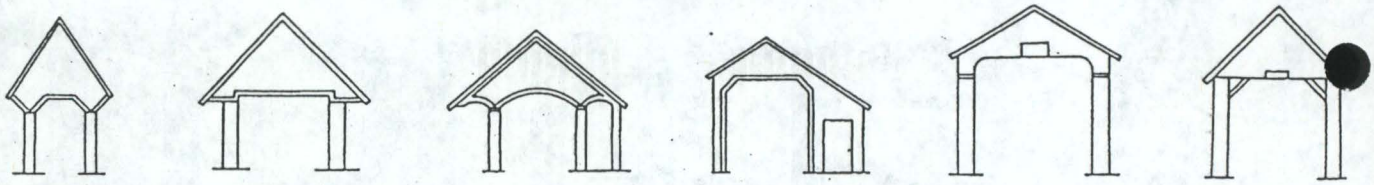
DANGER!

Neglected, decaying and hard to find,

Vermont's Covered Bridges deserve better treatment

By Ed Barna

Portal Designs of New England's Covered Bridges



Bennett Bridge
Wilson's Mill,
Maine

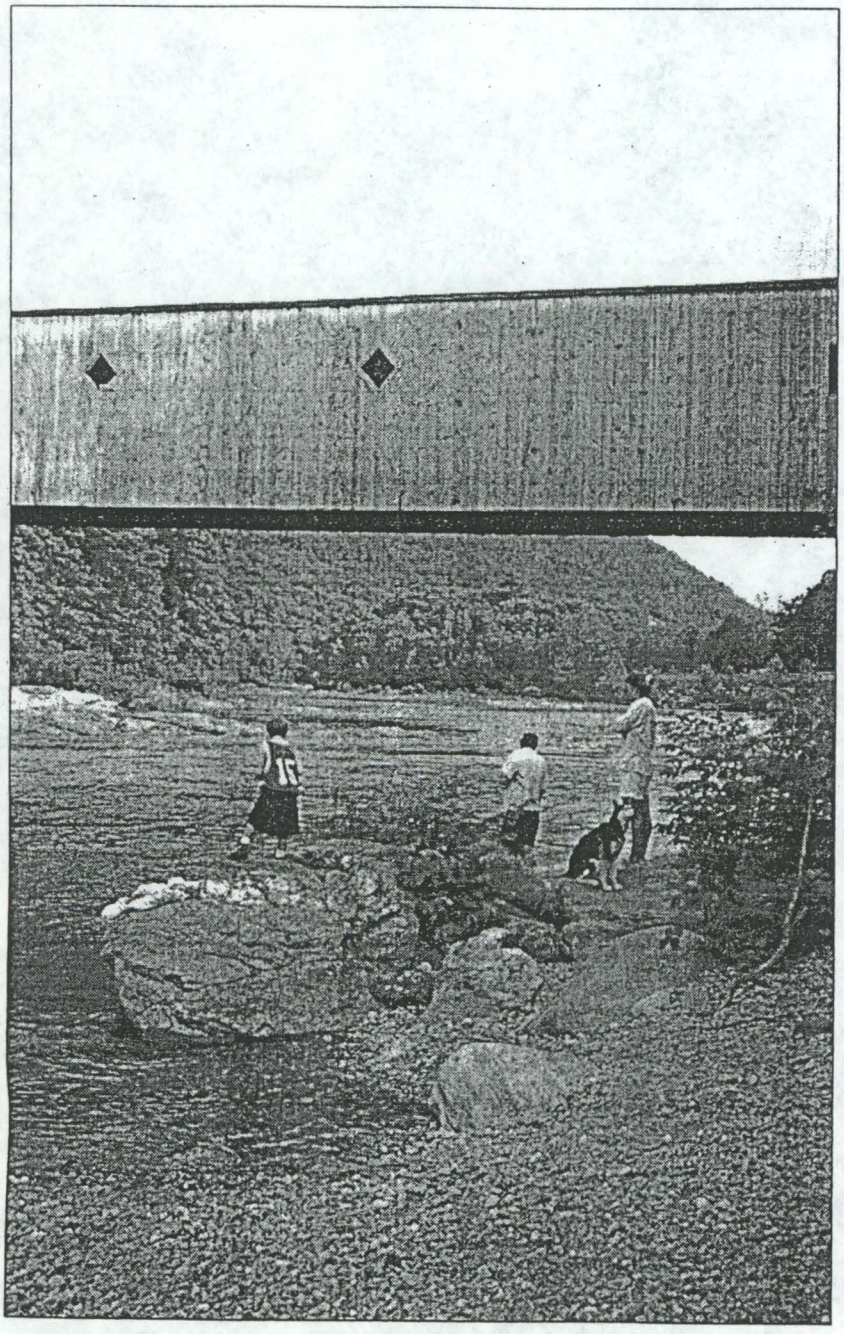
Lovejoy Bridge
South Andover, Maine

Lyndonville,
Vermont

Creamery Bridge
Brattleboro, Vermont

West Cornwall,
Connecticut

Arthur Smith Bridge
Lyonsville,
Massachusetts



A family fishes in the West River at the West River at the West Dummerston Bridge, a two-span Town lattice built in 1827 by Caleb Lamson. At 280 feet, it is the longest covered bridge entirely within Vermont.

DANGER!

Neglected, decaying and hard to find,

Vermont's Covered Bridges

deserve better treatment

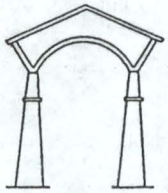
Story and photographs by Ed Barna

When I tell people that I spent much of the past summer taking pictures for a book on Vermont's covered bridges, I'm often asked "Did you meet any lonely farmwives?"

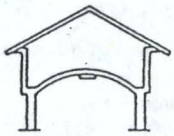
The reference is of course to the runaway bestselling romance *The Bridges of Madison County*, which begins with *National Geographic* photographer Robert Kincaid's quest for covered bridges and leads to a brief but passionate affair with his guide.

"No," I reply, "but I've met a lot of lonely covered bridges."

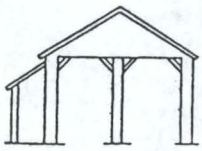
Ed Barna is a free-lance writer.



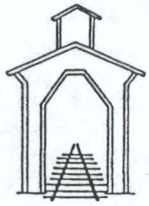
East Shoreham, Vermont



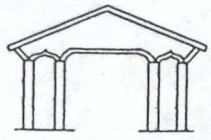
Albany, New Hampshire



Museum Bridge Shelburne, Vermont



Hardwick, Vermont



Asuelot, New Hampshire

My reply is both flippant and serious. As the summer wore on, I came to feel that Vermont treats these priceless, irreplaceable treasures poorly in comparison with other states like New Hampshire and New York.

There seem to be serious shortfalls in conserving the bridges, in educating the public as to why they matter, in promoting them as tourist attractions and in planning for their future.

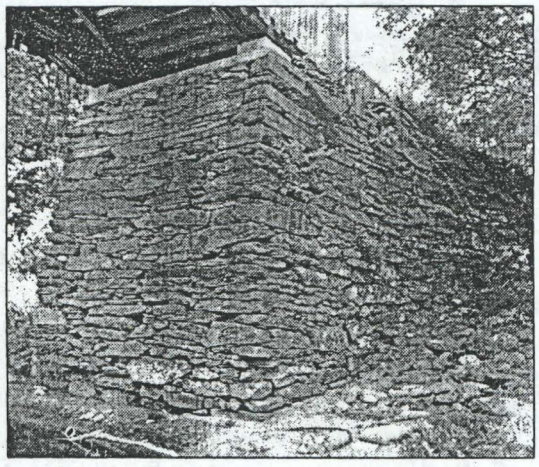
Nor was I alone in this opinion. Covered bridge restoration experts, historic preservation officials, relatives of former bridge builders, and people living near bridges all seconded the conclusion that at a time when so-called heritage tourism seems to be burgeoning, Vermont is overlooking major assets.

At the same time, it seemed as if some sort of awakening might be in progress. The book I was working on, for one of Vermont's publishers, turned out to be only one of several such efforts to produce, for the first time, a useful guidebook.

The Agency of Transportation had been conducting a major study of the state's covered bridges, and was taking greater account of preservationists' recommendations. And everywhere I went, those who lived near the bridges reported a steady traffic of photographers, artists, and other sightseers.

While I'm still frustrated by what I see as less-than-adequate care for covered bridges, I find it hard to blame anyone. I myself am a classic example of a native Vermonter who never appreciated them while growing up, and has only slowly come to understand their true significance.

It's been a memorable summer, with treks through the almost visionary landscape of far northern Vermont, unexpected natural wonders like the day yellow swallowtail butterflies congregated near every bridge, idyllic scenes at bridgeside swimming holes, and hours spent in a dreamlike state. But of all the joys, the greatest has been reaching across the centuries to a greater respect for what the early Vermonters and their Yankee contemporaries accomplished with wood. I have come to believe not only that it is worth the cost of maintaining historic covered bridges, but also that it is practical and economical to build more of them, especially now that global warning and ozone depletion have shown us the need for a more sustainable way of life.



This fieldstone abutment at the Downers Bridge in Weathersfield is one of the finest dry stone bridge foundations in the state.

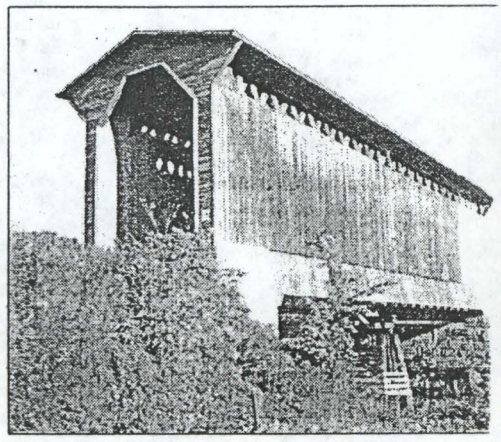
By the Light of the Burning Bridge

Growing up in and around Brandon, I took the area's dozen or so covered bridges for granted, like so much of the state's beauty.

Living in New Hampshire after college, a kind of turning point came through a close friendship with Richard J. Ducey, who has worked at various times as an antiques dealer, furniture refinisher, barn mover and house builder. A collector of antique hand tools, he brought to life something my history books hadn't covered: what I now think of as America's Great Age of Wood.

Shipwrights, wainwrights, wheelwrights, millwrights, coopers, cabinetmakers, ca penters — these men understood fine details of selecting, sawing and joining wood th modern factory production has largely bypassed. Ducey collected and kept in use hu dreds of hand-made planes, each with a special purpose and each necessary to repr duce antique woodworking.

Particularly, the old-timers understood timber framing, or post-and-beam construction, as it's also called. To put together clipper ships, steepled churches, and New England's classic barns, they eschewed nails, favoring braced and pegged all-wooden joints.



The Fisher Bridge in Wolcott is one of two cover railroad bridges remaining in Vermont. A steel beam now reinforces the wooden timbers.

Ducey told me stories of the fantastic strength this type of integrated, unitary construction brings to buildings. In one case, he said, a wrecking ball was brought in to demolish a colonial-era house — and bounced off, forcing the crew to do their dirty work by hand.

But my real appreciation of timber-framed bridges began, regrettably, with the of the burning of Dean's Bridge in Brandon in 1986. Some of the disaffected youths were hanging around the town (this from a reliable police source) decided a good p would be to pour gasoline on the 133-foot structure and set it ablaze.

The town then had to decide what should replace the historic bridge. A strong tion advocated a new covered bridge. A bridge builder from Ashland, NH, na Milton Graton was ready and willing to erect one for less than $100,000, and insist could carry an adequate traffic load. Graton had already shown it could be don building a covered bridge in Woodstock in 1969. Not only had he used historic met of construction, he had insisted on using oxen to tow the completed bride into plac

But state and federal funds wouldn't apply to such a venture, so the town's sha the cost would be less with a concrete-and-steel bridge. Truckers and farmers favo stronger bridge, and others didn't want to waste money on something that cou torched again. It took a verbal conflagration at town meeting to decide what to c the end, a million-dollar concrete-and-steel bridge spanned Otter Creek — and t I'm ashamed to say I voted for it.

In a parallel career, I began teaching courses for Elderhostel, a nationwide prc which combines mini-courses and vacation stays for senior citizens. Two years Jerome Wyant, a dean at the College of St. Joseph, had the idea of an Elderhostel c on covered bridges, and asked if I would teach it. I jumped at the chance, and pl into the research literature.

The Covered Bridge State

Almost from the start, it was a schizophrenic experience. On one hand, ther plenty of material on covered bridges in general, largely due to the research and ings of Richard Sanders Allen, Herbert Wheaton Congdon, Eric Sloane, ar

Continued on Page 6

COVERED BRIDGE

Continued from Page 5

American Society of Civil Engineers, all nearly a half century ago.

There was lore about their roles as "kissing bridges" (somewhat like walking under mistletoe), wishing bridges, childhood playhouses, and even sites for town events such as church suppers and political rallies.

But finding up-to-date information about Vermont's bridges proved unexpectedly difficult. One of my first actions was to call the Division of Travel and Tourism to get a list of the state's covered bridges. They didn't have one. Try the Division for Historic Preservation, they suggested. The DHP list turned out to be an outdated promotional handout, listing many bridges that no longer existed and missing several that had been added.

The official state highway map had covered bridge symbols on it, but these faint blue marks often bore no relation to the actual location of the bridges. Worse yet, many bridges weren't indicated, especially if they had been closed to traffic.

Had it not been for a couple of commercial road atlases, I would never have been able to find the bridges. But even there, problems abounded: covered bridge symbols on the wrong side of the road, cryptic directions, absent bridges, town names mixed up with village names, no-name roads, all leading to wild goose chases.

Knowledgeable local informants were just as hard to find, especially in remote areas of the Northeast Kingdom. A surprising number of residents had no idea how many bridges were in their towns, let alone where they were. At least my frustration was mitigated somewhat by the evident need for the book I was preparing.

The official disorganization seemed odd because Vermont is clearly the nation's leading covered bridge state. There isn't an up-to-date bridge census that I know of, but back in 1954, Allen counted 390 in Pennsylvania, 349 in Ohio, 174 in Indiana, 149 in Oregon, and 121 in Vermont.

Dividing the number of bridges into the number of square miles in each state, Vermont's 79 square miles beat out Pennsylvania's 116 for first place. Even if no other state had lost a single bridge in 41 years, Vermont would still be number one.

Iowa? With 56,275 square miles, it had 13 bridges in 1954, or 4,328 square miles per bridge. As I tell my Elderhostelers, if you're looking for lonely farmwives, go to Iowa; if you're looking for covered bridges, come to Vermont.

But Vermont itself has yet to realize what it has. How often have you seen an ad proclaiming us the covered-bridge heartland of America?

This pattern of neglect wouldn't have been so irritating had I not taken a look at some covered bridges in New Hampshire while preparing to lead a tour last summer. There, I found state highway signs pointing the way to the bridges, and well-designed and maintained parking places for visitors. Each bridge was numbered for reference to maps or to a lavishly illustrated state highway department guidebook, and each site had an interpretive sign. The contrast with Vermont could not have been more complete.

Heartwood

Covered bridges are some of our best monuments to the old forests of New England, the virgin timberlands whose tallest spires were once blazed with a special mark reserving them as masts for the King's Navy. Wood of the size and quality those forests produced is simply impossible to find today.

The late Milton Graton — whose son Arnold and nephew Stanley now carry on his bridge-building work — wrote a book that helped explain the difference. Trees that grow in the middle of a dense, naturally evolving forest have very few side branches (the light is above them, not to the side) so there are few knots or imperfections in the resulting timbers. They grow very slowly, putting on small annual rings, so the wood is extremely dense.

Allowed to survive for centuries, such trees become so thick that timbers can be cut entirely from heartwood, rather than including the softer, outer sapwood. One reason some covered bridge timbers show the marks of hand hewing is that the trees were too large to be taken to a sawmill and had to be shaped into square timbers with an adze where they fell.

The U.S.S. Constitution was called "Old Ironsides" because its builders chose such old-growth oak trees for its outer planks (this from Eric Sloane) that cannonballs literally bounced off.

That's the sort of wood in the bottom chords, as they are called, that carry most of the weight in covered bridges, though it is spruce, hemlock or pine rather than oak. David Lathrop, the Agency of Transportation's engineering section supervisor, said one reason the state bridge designers sometimes ● ify glue-laminated timbers ● ring covered bridge repairs — to the consternation of purists — is that the same type of wood isn't available any more.

Much of my education came through Jan Lewandoski of Stannard, who has built three covered bridges, including one in Vermont at Kent's Corners, and has repaired many of Vermont's classic bridges. He said that engineering schools have put the designs of century-old covered bridges though computer programs, only to learn that, theoretically, the bridges should have collapsed of their own weight. But the strength values used in the software programs are based on regrowth woodlands, not virgin forests.

Continued on Page 12

COVERED BRIDGE

Continued from Page 6

It is possible to replace each part of a covered bridge one by one as problems appear — a sharp contrast with metal bridges, which are more subject to catastrophic failure. Indeed, this is one advantage cited by those who advocate building more of them.

But that sort of interchangeability shouldn't become an excuse for neglect. The original timbers are national treasures, and I believe the state should take a greater role in assuring that the roofs of covered bridges don't leak and deteriorate them.

In Truss We Trust

Important as straight, dense, and knot-free beams were to the early bridge-builders, the designs were of even greater significance. Another reason Vermont's covered bridges matter is because they symbolize one of history's leaps forward: the unparalled revolution in wooden bridge-building techniques that took place in the first half of the 19th century.

As steel began to replace wood later in the 19th century, the bridge designers drew on the work of wooden-bridge designers. Ironically, those metal bridges are now more at risk than the covered bridges, according to the Division for Historic Preservation.

There had been covered bridges in Europe, where timber-framing helped build the great cathedrals. An Italian architect named Palladio had sketched out four ideas for wooden bridge trusses as early as the 16th century. But for lack of trees, and because most of the rivers were already crossed with Roman-style stone arch bridges, Palladio's ideas remained uninfluential — until they arrived in 18th century America. With the Revolutionary War won, there was a need to bridge many rivers and open up the new country, and the presence of immense forests suggested a way.

Nicholas M. Powers

It was in Vermont, at Bellows Falls, that Col. Enoch Hale in 1785 built a 365-foot, two-span (shore to island to shore) wooden bridge that opened many people's eyes, as well as opening up Vermont to trade with the Boston market. Although it wasn't covered — an 1804 Timothy Palmer bridge in Philadelphia began that trend — Hale's bridge is acknowledged to be the one that started the surge of design work by showing wood was capable of spanning large rivers.

Here, it is necessary to talk a bit about bridge engineering. In a covered bridge, the sides do the work, not the floor, and certainly not the roof, which is only there to keep the rest of the wood dry so it won't rot.

Each side of a true covered bridge is a truss, a unified combination of architectural members. The truss spreads the stress from the bridge's weight, in effect shifting the load to where the ends of the truss rest on streamside abutments.

It would be possible to make one huge timber out of many boards for each side, but that would weigh too much. (Modern "stringer" bridges do something similar by using huge steel I-beams as the bottom stringers, and get away with it because steel is so strong in proportion to its weight.)

But a wooden truss acts like a gigantic plank standing on its side, creating an integrated structure that weighs much less that a solid, laminated board would because of all the empty spaces in the design.

The arrangement of the timbers is the key, because a good design takes advantage of wood's great strength when force is not applied across the grain. The most remarkable examples of this come from engineering schools and Odyssey of the Mind competitions in which contestants create covered-bridge-like structures out of less than a pound of balsa wood. These airy, seemingly flimsy balsa wood tunnels withstand almost miraculous weights before they are crushed during the judging.

Once I understood something about their design, covered bridges seemed more resourceful than rudimentary, more ingenious than improvised. The concept was particularly important during the 1800s — an expansionist time when all sorts of schemes were hatched for roads, canals and, later, railroads. Anyone who could devise and patent a quicker, easier, cheaper way of building a stronger wooden bridge stood to reap immense royalties from the invention.

First there was self-taught architect and house-builder Timothy Palmer, born in Massachusetts, who in 1797 took out a patent on an arched truss he used to span major rivers like the Potomac, Schuykill and Delaware. But his Palladio-style designs had great deficiency: the traveler had to go up and down, up and down, to cross a river.

Theodore Burr, who learned timber-framing from his Connecticut millwright fa took the next step, adapting a Palladio design into a combination of arches and m ple kingpost trusses (see diagram). In 1817, he patented the Burr truss, which h level roadway, a design that was a prototype for thousands of bridges, includin first Vermont covered bridge (now gone) in 1824 at Highgate Falls.

But the real leap forward, one that had no precedent in Europe, came in 1820 Ithiel Town, a Connecticut architect and builder, patented his "Town lattice m with the double lattice (see diagram) patented in 1835. Using criss-crossed diag planks rather than massive timbers, it was easier to build and phenomenally strong

Eric Gilbertson, the head of the Division for Historic Preservation, said he kno only one instance in which a Town lattice truss failed in Vermont, as opposed t floorboards giving out. A trucker tried to run it with an illegal load, heard the tim cracking, got out and ran. Had he kept driving, the bridge would have surv Gilbertson said. But as it was, "the bridge literally exploded. There were pieces tered from hell to breakfast," due to the even distribution of stresses.

Most of Vermont's bridges are Town lattices, a name that sometimes misleads ple into thinking they were called that because towns built them. It was said tha Town lattice could be "built by the mile and cut off by the yard," a statement almost literally came true in this century when a developer bought a disused brid Cambridge,, Vermont and moved half to South Pomfret and half to Weathersfie become housing project entrances.

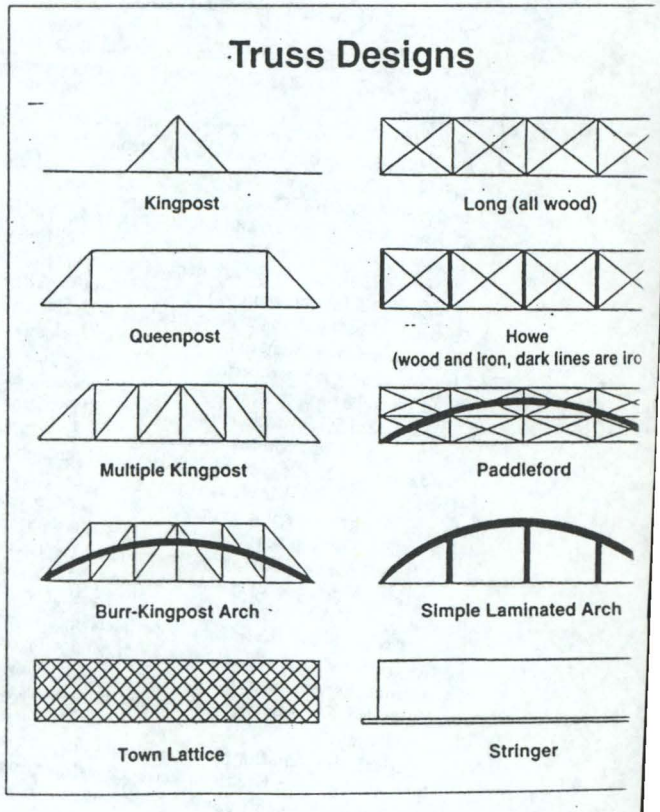
In 1830, Town found a major competitor in New Hampshire-born A engineerCol. Stephen Long, who patented a truss with boxed X's. But after 1840, men were succeeded by William Howe of Spencer, Mass., who solved the weakne covered bridges — the tendency of vertical stress to overcome the wooden joints substituting vertical iron rods (giant nuts and bolts, in effect) for the vertical timb a design similar to Long's.

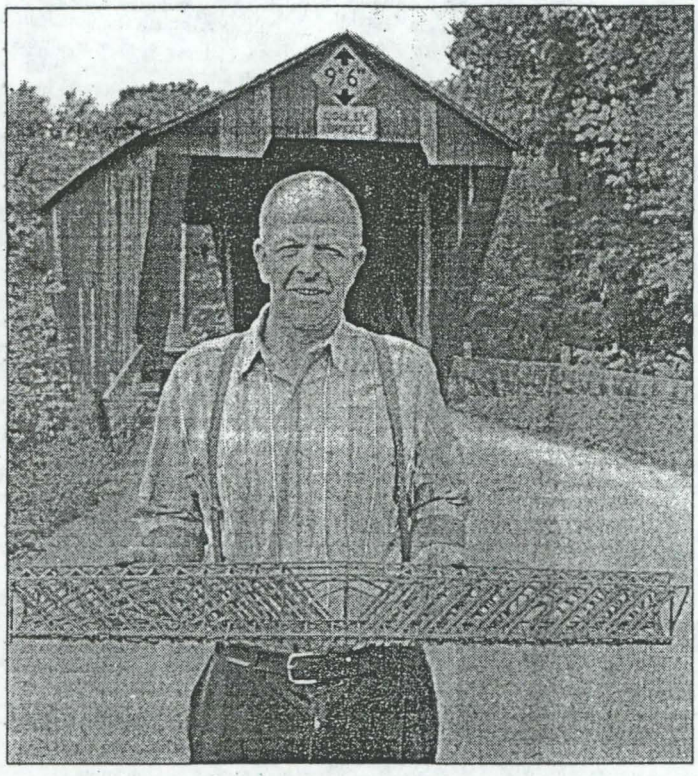
Both Howe and Town trusses were built into the 20th century, with Howe's d especially important to railroads because it could be pre-manufactured and shipp kit form. Proponents of building new covered bridges point to the way these stru carried locomotives, which weighed 60 tons or more.

There were other gifted builders who never patented trusses. Among these w man often thought to be the greatest of them all: Nicholas Montgomery Powers.

A Legend in His Own Time

Born in 1817 in a log cabin near Pittsford, Powers was the son of a wheelwrig builder. He quickly showed an aptitude for mathematics and model-building,





Robert Wood, a grandson of Nicholas Powers, holds a model Powers created for an experimental truss that Powers never had a chance to construct. Behind him is Pittsford's Cooley Bridge, built in 1849.

with local bridge builder Abraham Owen, and at the age of 19 successfully proposed building a covered bridge where Route 7 now crosses Furnace Brook near its junction with Route 3.

His father had to sign an agreement with the selectmen to pay for any timbers young Nicholas spoiled. But the bridge was strong enough to last 96 years and carry the weight of a 20-ton steamroller that the state crew had brought to help build a modern bridge at the site in 1931.

His reputation spread, and not just as a bridge builder. He moved the spire on the Rutland County Courthouse to the front of the building where it is today, erected West Rutland's first marble quarry derrick, constructed numerous barns, and built the Kingsley Mill in Clarendon so well that it withstood the great Flood of 1927 — as did two of his Pittsford bridges, despite being washed off their foundations.

In 1866, Powers went to Perryville, MD, to work on a 4,700-foot, multi-span railroad bridge. After a tornado destroyed the first attempt, and the college-trained engineers couldn't come up with a better design, Powers was asked if he could devise one.

He looked at his watch. It was 9:45 a.m. "I'll give it to you after lunch," he replied.

By then, he had covered the sides of a timber block with drawings and calculations, and got the job. His crew of 500 completed the work in time for him to win a $500 bonus, with his 16-year-old son Charles designing the drawspan.

But his greatest triumph came in 1855, when he was asked to build a bridge across Schoharie Creek in North Blenheim, NY — a task that meant crossing 210 feet of water with a 232-foot, two-lane span. Powers devised a plan never used before or since, featuring three large Long-style trusses and an solid oak arch down the center of the bridge that North Blenheim residents now call "The Rainbow."

"Powers' Folly," the sidewalk superintendents sneered, predicting it would crash into the creek as soon as the trestle-bridge-like temporary scaffolding beneath it was removed. Powers climbed onto the roof and announced, "If she goes, I'll go with her!" His bridge, the world's longest wooden span, stands to this day though it no longer carries traffic.

Today, this Paul Bunyanesque figure (Allen writes that Powers was reputed to have built all the Town lattices in Vermont and most of those in New England and New York) is nearly forgotten in his home state, the main exception being Pittsford, where the historical society celebrates his career in their museum. When the contents of his former home in Clarendon were auctioned off in 1993, most of his prized tools were either sold or given to North Blenheim, where the Blenheim Bridge Historical Society has honored Powers over the years.

Bridging Past and Present

To be fair, there are Vermont covered bridge sites so obviously the result of community care that the heart leaps for joy. There have been community efforts like Grafton, where they raised over $100,000 to save the Kidder Hill Bridge.

But after visiting all the bridge sites, I have to report that there are too many bridges closed after long neglect, or being pounded into oblivion by excess loads, or steadily losing strength. Privately owned bridges are especially endangered because they aren't eligible for federal or state funding, even though they are much-visited public resources.

David Wright, a Westminster resident who heads the National Society for Preservation of Covered Bridges, said the society was formed in 1947 to help counteract the trend to simply destroy old bridges during highway construction. Visitors to Vermont's covered brides often see cards left by bridge society members, asking that the society be alerted if a bridge is in danger — something Wright said has saved many bridges in the past.

Now, he said, the battle is over how to preserve them. Vermont has witnessed battles over putting in skylights (the Lincoln Bridge in Woodstock), adding Glulam timbers (the Cornish-Windsor Bridge in Windsor), putting steel beams under wooden bridges (the Chiselville Bridge in Sunderland) and replacing old with new timbers (the Henry Bridge in Bennington).

"I won't say that (the Agency of Transportation) has done more damage than the 1927 Flood, but I'm tempted," concluded Wright. "I've read more foolishness in engineering reports on historic structures than almost anywhere else."

From the Agency's standpoint, Lathrop said, "We don't have a lot of expertise, at least in the department, on covered bridges." That's why an outside consultant did the recent survey and made the recommendations on whether particular bridges should be moved or rebuilt, he said.

But one thing the state agency does know is that "people don't use any common sense. They beat them to death and then say, `Why don't you fix it again?'" Lathrop said. "It's frustrating."

But newly rebuilt covered bridges are different, Lathrop acknowledged. After the aforementioned Town lattice bridge exploded in Rockingham, the trucking company's insurance paid for a new bridge, by Graton Associates. "That thing would probably take a Sherman tank," he said.

I've come to believe there could be a synergy between building more wooden bridges, thereby supporting a corps of skilled bridge-builders, thus justifying long-term forestry management practices, all of which would enhance both tourism and a sense of local identity.

The danger of arson can be eliminated, Wright said, by using a new fire prevention product called Nochar Fire Preventer, that is invisible, non-toxic, easily applied and costs about $30 gallon.

I have also concluded that this state needs a covered bridge museum: not just a building with exhibits, but also a site that could become a home for homeless bridges. By that, I especially mean the former highway bridges that were literally put out to pasture because people wanted to save them from destruction, not because they wanted to shoulder the burden of maintaining them.

Such a site could also be a testing and demonstrate facility for towns wonderin whether wooden bridges are strong enough, or whether fire protection materials real work. Commercial bridge-building companies would probably be willing to mark their capabilities at such a center, and help fund it in the process.

To operate such a central clearinghouse, there ought to be a Vermont Society f Covered Bridges, similar to the national society, the society in New York State, and t groups that used to exist for New Hampshire and for the Connecticut River Valley.

My initial thought was that one of the farms perpetually preserved by a land tr might make an ideal site for such a museum. If there were a classic barn, its timb framed interior would be the ideal environment for interpretive displays.

Karen Seward, a Powers' descendant, pointed out that the ideal location might the old Nicholas Powers farm in Clarendon, where his brick house remains. Th Powers descendants own the land, the house is not occupied, and there is a barn enough for exhibits, she said.

Jan Lewandoski suggested building examples of all the different bridge types, only for tourists, but so school groups could come and learn firsthand about that asp of Vermont history.

My Elderhostel students, who come from all over the country, are good example the people who would flock to such an attraction. For them, the environmental social and engineering and historical aspects of wooden bridges tended to blend int single word: values.

Helen Crane, of Winchester, MA, wrote that "In these days of conspicuous consu tion and a throwaway society, covered bridges provide a safety net for values."

Don Cargo, of Brighton, Michigan, wrote that "For me, the covered bridge Vermont provide part of a window to the past when life was slower, work was har and our our `four freedoms' were truly appreciated and not taken for granted. bridges remind us of perhaps better times in a way, and could/should help us ref our individual and collective effort to reach out, grab and hang onto those values our country is based upon." VSM

From:	**"Eric Gilbertson" <SOVHISTP_SERVER1/ERICG>**
Organization:	**Historic Preservation, Vermont**
To:	**#everyone**
Date:	**Mon, 8 May 1995 14:50:40 EST**
Subject:	**Economics**
Reply-to:	**ergilbertson@gate.dca.state.vt.us**

Tom Carr an economist from Middlebury College called me to ask what the State was doing for covered bridges. The reason he asked is that covered bridges were one of the amenities he used in a study of property values and he wanted some very general comments. Some other amenities were: lakes, ski areas, mts. wetlands, wildlife management, National Forest, Stage Theater and Landfills and Super Fund sites.

I was very interested in that he said thah having a covered bridge in a town added about $6,000 to the median property value. WOW....I asked if he used other historic properties or districts and he said that he did not. If a covered bridge adds $6,000 what would being in an historic district next to a covered bridge.

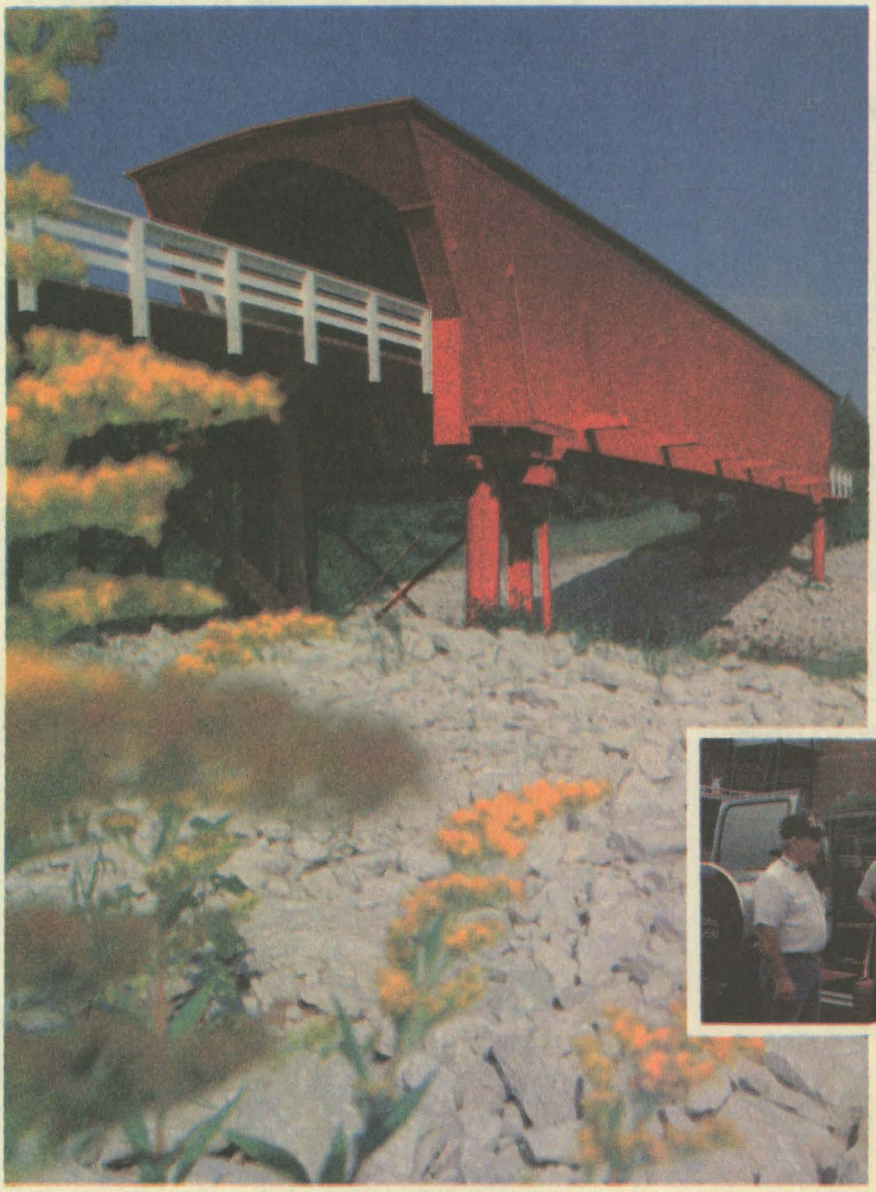
It will be some time before his study is ready for publicaiton but he did say he would sent me a copy for DHP.

FAMILY LIVING
IN FARM COUNTRY

ELSA

October 1992

Piece of History
11 bridges remain in Iowa



Football tailgating

Covered bridges reflect bygone era

Covered bridges reflect farm heritage

Like many turn of the century covered bridges, Madison County's transplanted Cedar Bridge has found a haven in a city park.

By Denise Bodeker

Taking a walk through history can become a reality if you know where to look. Many Iowans have discovered a keyhole to the past in Iowa's 11 covered bridges located in Northern, Central and Southern Iowa.

The oldest of the bridges is 125-years old and the newest addition is a spry 23-years old.

Historical records show we can thank Iowa's farm heritage for these beauties because most were built by farmers working off their poll taxes. They often designed the covered bridges after those of their homelands in Europe.

Covered bridges were very popular in the 1800s because of the durability ensured by their protected flooring and struts. An uncovered bridge in the 1800s might have lasted 10 to 15 years, say historians, compared to many covered bridges throughout the United States that still stand today.

Madison County is Iowa's covered bridge mecca with a combination of four steeped-roof and two flat-roofed covered bridges, which historians say are unique in the Midwest. Recently, two of the six bridges were renovated according to the National Register of Historic Places' guidelines.

The people in the county are eager to share these monuments of the past and will hold their 22nd Covered Bridge Festival Oct. 10 and 11. The colorful festival offers charter bussing to the tree-lined bridge sites for more than 40,000 visitors.

Repairs Needed

Many of the covered bridges in Iowa have been unused for many years and need considerable renovation, state historical records say.

Nancy M. Corkrean, a covered bridge enthusiast in Winterset, says most counties probably stopped maintaining covered bridges when farm machinery became too large to pass through them. County money was instead spent on new roads and bridge maintenance.

Madison County Engineer Brian Morrissey says the two recent bridge renovations cost $140,000 each. He estimates the original cost to build each bridge was between $900 to $1,200.

"My philosophy is you fix it or get rid of it," Morrissey says. "I was happy to help preserve a piece of history. I think 50 years from now people will be very proud of what they have done."

Another covered bridge enthusiast Pat Nelson says most of the Madison County bridges are in their natural settings, which helps create a feeling of stepping back in time. She says it is fascinating to see what was built with the limited tools of 100 years ago.

Former member of the Cerro Gordo County Board of Supervisors

Les Graversen saw the historic value of covered bridges 24 years ago. He proposed the county build a covered bridge in Rock Falls Park where an old wagon trail bridge once stood.

"I figure anyone could have built a trestle," Graversen says. "But a covered bridge would really add to the history of the area."

Builds a bridge

Graversen, with the help of his hired help, built the oak base of the bridge beside his hardware store in the north central town of Plymouth. He modeled the community-funded bridge after one of the Madison County bridges, but, like in the old days, he used no pattern.

In May 1969, after working on the bridge for 1½ years, Graversen and community volunteers loaded the two-piece base on three connected hay wagons and moved it 5½ miles to its location over the Shell Rock River.

Community elders advised Graversen to install the bridge at an unusually high elevation to protect it from being washed out by high waters. A few weeks after the base was secured a storm flooded the area. Just as the elders had advised, Graversen says the bridge was high enough to protect it from harm.

As part of the next step in construction, Graversen called on the community to help attach the side panels and roof. Throughout the spring and summer 76 people contributed their labor and money to the bridge construction.

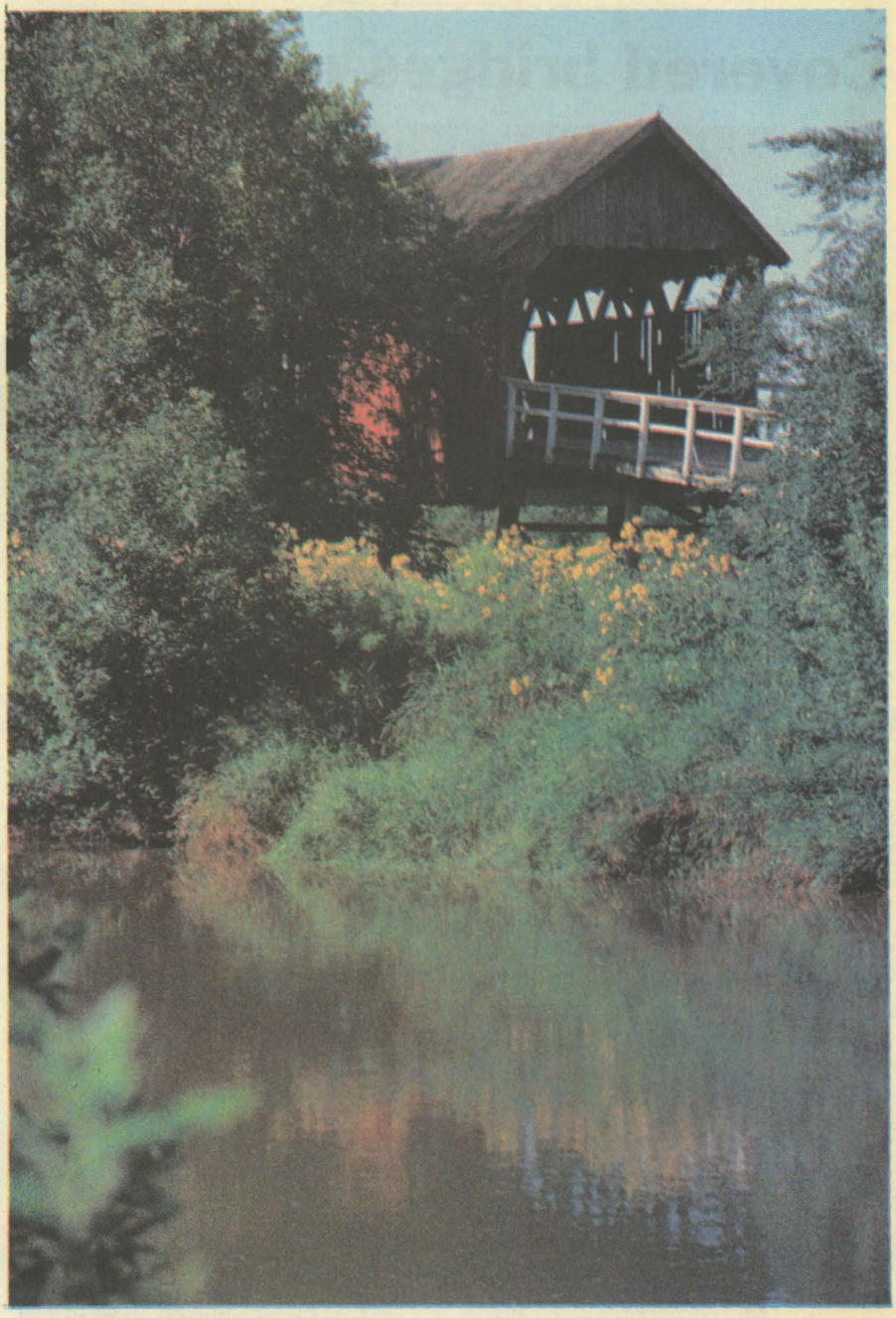
Graversen says it was like an old fashion barn raising in many ways. People came at 5:30 p.m. twice a week and worked until dusk. Immediately following, people gathered at the park shelter for a potluck dinner.

On July 27, 1969, the bridge was christened.

Iowa's oldest bridge

The community of Delta in Keokuk county has the bragging rights to the oldest standing covered bridge in Iowa.

The only arch-style braced bridge west of the Mississippi was started in 1867 and erected in 1868. It stands in its original location in Covered Bridge Park, just a few miles south of Delta off of highway 21 and G76.



The charm of Madison County's covered bridges inspired a north-central Iowa community to build this bridge over the Shell Rock River in Rock Falls in 1969.

Marion County has maintained two covered bridges from the 1800s. Visitors can still drive across the Hammond Bridge, built in 1970. Signs lead to its location 3½ miles south of Attica on G76.

The Marysville Bridge earns the state's vagabond title. Historical records show it was built in 1891, a few miles north of Melcher-Dallas over White Breast Creek in Marion County. In 1926, after each piece of the bridge was dismantled and number, its next stay was in Marysville.

Playing out the life of a vagabond, the bridge was again dismantled in 1968. This time one-half of the bridge was moved to the Marion County Park in Knoxville and one-half was reassembled in the Wilcox Wildlife Preserve on Highway D17, about nine miles southeast of Knoxville.

LIVING WITH CHANGE

Eliminating those *"I don't wanna go to work" blues*

By Marilyn Schnittjer

Do you love Fridays and hate Mondays? Have you suffered from the "I don't wanna go to work" blues? Is your job making you sick? It could be that you need to go to work on increasing your job satisfaction.

One thing is certain, you will have better mental and physical health if you enjoy working and like your job. Going to a job you hate produces stress. Too much stress over too much time can cause many kinds of physical problems (ulcers, migraines and high blood pressure to name a few) and make you less productive.

Try this exercise. Write down a short response to each of the following items concerning your employment:

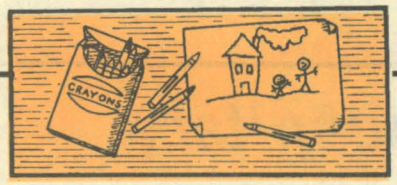
- Three things I really like about my job.
- Three things about my job that I don't like but can't change.
- Three things about my job that I don't like **and** are within my power to change.

Your responses to the first set of questions are the kinds of things to remember when you need encouragement. The items in the second group are things you have to either accept or figure out how to move to the third group – things you can change.

Most of the things you can influence for the better are in the third group and you have two powerful tools. One is attitude and the other is control. It is also helpful to realize that if a job is too damaging to you and impossible to make satisfying, it may be time to ask, "Is this really the job for me?"

The following are tips for making your current job satisfaction level higher. Try to do one thing each day and repeat it as many times as necessary to make a difference in your attitude and/or control.

- Write down your goals, both short-term and long-term and focus on doing things that help you reach your goals.
- Fix up your work environment and make it clean, pleasant, and efficient.
- Tune into your body and keep it as mentally and physically healthy as possible.
- Maintain inner calm and a sense of peace when busy with work activities or in stressful situations.
- Respond to your intuition. Pay attention to hunches you have and act on them.
- Use your time and energy wisely. Use most of your time for important activities and reduce or eliminate less important efforts.
- Take responsibility for yourself and quit blaming others for who you are and where you are.
- Accept what can't be changed, especially people.
- Keep your life balanced with quality time with family and friends, and meeting your physical, mental, emotional and spiritual needs.
- See problems as challenges and think about what you learned from the last problem you solved.
- Do something special for yourself. You deserve it!
- Concentrate on the job at hand. The greater your ability to concentrate, the more successful you can be at anything.
- Listen. Good listeners often help people solve their own problems.
- Promote healthy self-esteem for yourself and others. Pay at least five compliments to co-workers every day.
- Be optimistic and appreciative. Positive people are more emotionally and physically healthy than their gloomier co-workers.
- Look at life as a school. Look upon the challenges of your workday as tests designed to instruct and strengthen you.
- Forgive and forget. Unless you forgive and let go of negative feelings that surround hurtful incidents, the unresolved pain will form emotional blocks and limit your full measure of vitality.
- Nourish your social network. Good friends, loving family members and supportive co-workers add up to one of the best health insurance policies ever.
- Learn something new. Try to learn something that will make your job easier, more interesting, more effective.
- Brainstorm possibilities. Most problems have many possible solutions. – *Schnittjer is family life specialist with Iowa State University Extension in Northeast Iowa.*



KIDS PAGE

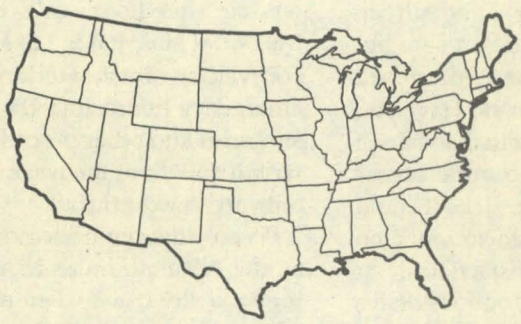
Select the States

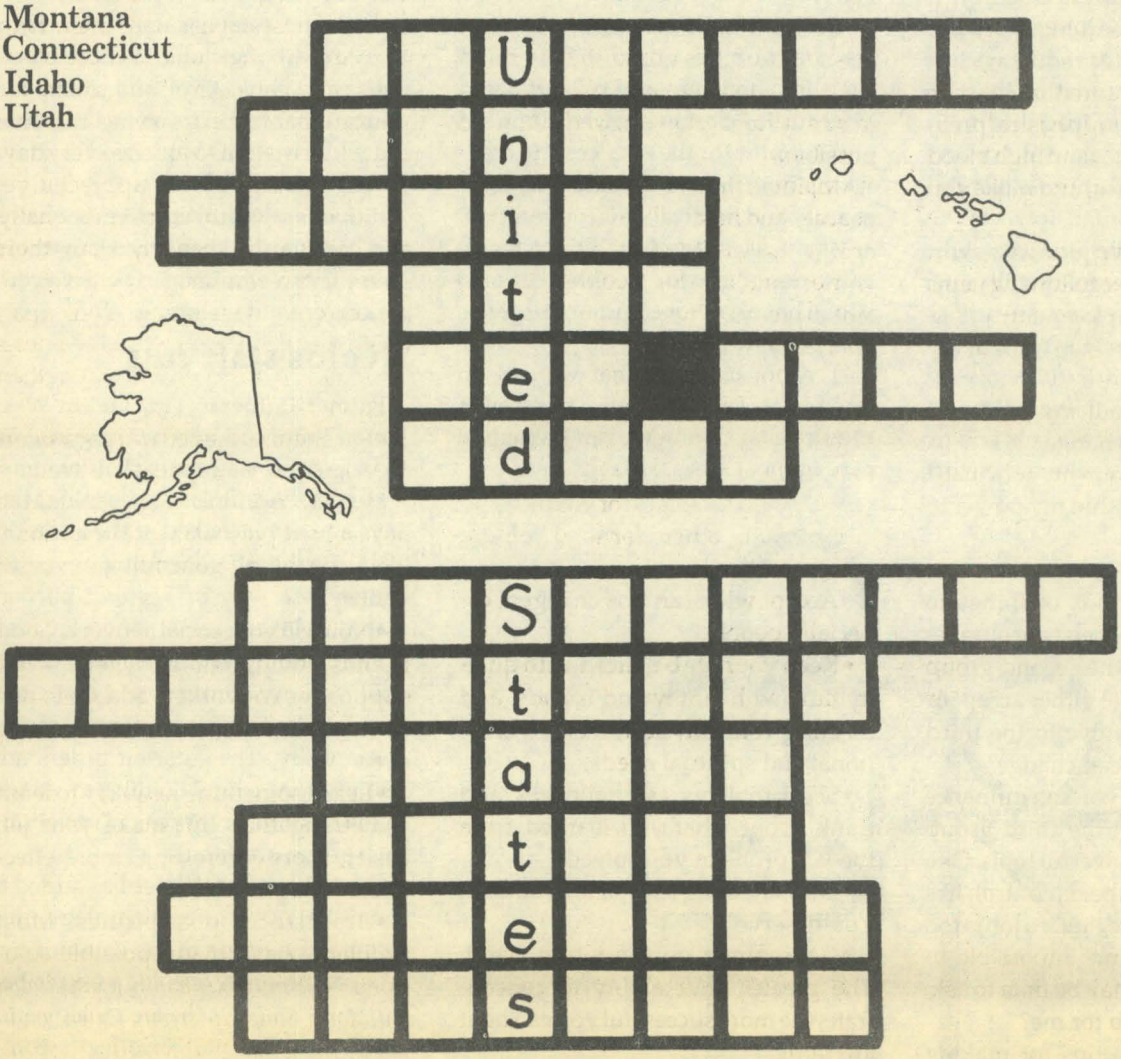
By Walt Trag

Fill in the squares by choosing the correct state for each line from this list. Three will not be used.

Maine
Missouri
Vermont
Tennessee
New York
Wisconsin
Montana
Connecticut
Idaho
Utah

Alaska
Florida
Mississippi
Kansas
Louisiana





Health care creativity key to survival of rural hospitals

By Denise Bodeker

Like their patients, many rural Iowa hospitals have needed careful analysis and tender loving care recently in order to stay healthy financially and to keep the doors open.

The shift to more out-patient surgeries, reimbursement woes, a shortage of rural Iowa health care professionals and inflation has motivated some rural hospitals to restructure their services and call on the community for help to survive.

Lake City's Stewart Memorial Hospital and McCrary-Rost Clinic in Calhoun County have found a healthy balance of primary care and acute care through their unique joint operation. Administrator Ed Maahs says the clinic-hospital combination has relieved the heavy workload that many area physicians face, as well as eliminated unnecessary duplicate testing.

He says that in small Iowa towns there may only be one physician, who in turn handles emergency calls after office hours. Maahs says many physicians feel burned out after a while because they find little time to relax and to spend time with their families.

The overworked physicians end up going to bigger cities where the work load is more evenly distributed, which leads to a rural physician shortage.

Rural citizens are then forced to drive greater distances for care, Maahs says.

Lake City's original McCrary-Rost Clinic, built in 1946, and its branch offices in Gowrie, Lake View and Rockwell City have a system that transfers all after hours calls to Stewart Memorial Hospital in Lake City.

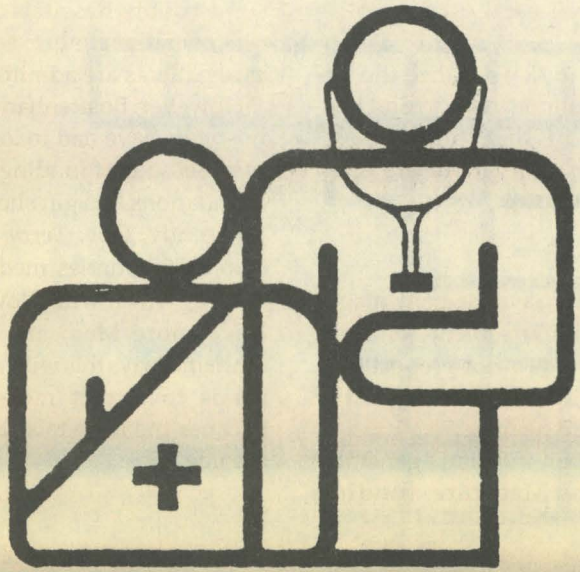
Physicians rotate working hospital emergency hours, and they perform surgeries and other procedures regularly throughout the week along side Stewart's medical staff.

Because the clinic doctors also work at the hospital, there is no need to repeat a clinic test when a patient is referred to the hospital.

Maahs says the thousands of dollars the communities raised to help build the clinic branches and two affiliated pharmacies clearly showed the need and support for the services. He credits the hospital-clinic success to community and medical staff cooperation.

Maahs says it is usually not medically necessary for people to go to urban hospitals for common surgeries and procedures.

"I'm not claiming that we can do open heart surgeries here, but from a medical standpoint we can give equal care in most areas," Maahs says.



"The staff here probably gives more personalized care because they tend to know their patients very well. That is the advantage of health care in a small-town community."

Creative techniques

Belmond Community Hospital Administrator Krys Biliunas says rural hospitals need to be more creative to survive.

"I can see rural hospitals becoming a stepping stone in the recovery process," Biliunas says. "People can come here for their therapy after hip replacements and other surgeries."

The Belmond community recently received a rural transitional grant to develop programs for the elderly. She says the hospital has used the money to form walking clubs, to check blood sugar and cholesterol, and to arrange educational seminars on health issues that elderly want to and need to know more about.

Biliunas says preventative care helps the hospital to keep costs down because it can eliminate expensive conditions from developing.

Avoids staff cuts

Palmer Lutheran Hospital in West Union branched into catering in 1986 to help solve staff cutback dilemmas.

Hospital Administrator Jeanine Matt says she never looked at the addition as a means of generating revenue, rather as a way of keeping kitchen staff employed.

The catering service provides cakes, cookies, low sodium meals, and more to patients as well as people of the community. The catering orders are usually for groups holding meetings in the hospital or for patients celebrating special occasions.

Since the 1980s Palmer has added a renal dialysis and opthomology unit to meet the needs of the community, and currently an oncology unit is being built. She says the technology and services the hospital can offer the community have made the hospital an in-

The McCrary-Rost clinic office in Gowrie is one of many clinics in the state that are meeting the challenge of changing rural health care needs. Administrator Ed Maahs at left stands next to Karen Vote, R.N. and David Archer, M.D., who have been practicing at the clinic since it opened in November 1986.

valuable asset.

But Matt says it is a constant battle to attract quality professionals to practice in the rural area.

She says most beginning doctors carry an average debt of $80,000 or more, and are almost forced to go into specialty practices in larger cities in order to command a salary to pay off this debt.

Grape Community Hospital in Fremont County's city of Hamburg has had its share of financial problems. Hospital administrator Dave Schultz says the hospital just endured a two-year wage freeze to help pull itself out of bankruptcy, which it declared in 1989.

"We have a group of extremely dedicated employees," Schultz says. "Most people are very proud to work here and want to see it succeed."

Schultz says there is no one solution to rural hospital problems.

He says the Hamburg community helped the hospital tremendously by raising $340,000, plus 10 percent interest, to pay off the bankruptcy debt by December 1992, nearly a year early.

Many rural hospitals in Iowa lose money because of the increased percentage of Medicare patients needing major surgeries and procedures, says Greg Boattenhamer of the Iowa Hospital Association.

He says Medicare pays the hospitals only 75 to 80 percent of the cost of the patients' procedures.

Although the majority of Iowa hospitals are non-profit, he says they still need to cover operational costs. Hospital employee salaries and benefits comprise about one-half of hospital expenditures while equipment and pharmaceuticals are the next greatest expenses.

"Most people don't realize the tremendous economic impact rural hospitals have in the community," Boattenhamer says. "They are often the largest employer."

Rural costs

Boattenhamer says the percentages of federal reimbursement for rural Medicare patients is not proportional to the rate of inflation nor the cost of providing rural health care.

He says urban hospitals generally receive more Medicare funding because of the higher cost of living in urban areas.

However, Boattenhamer says the government should consider that rural hospitals do not get a price break in buying pharmaceuticals because they do not buy in bulk; rural hospital ambulance services are more costly because they often need to drive a greater distance to pick up patients; and rural hospitals need to pay medical staff a salary competitive to urban hospital salaries in order to attract them.

County tax appropriations help some county hospitals to cover costs not federally reimbursed when Medicare patients are admitted.

However, Boattenhamer says many hospitals have had to look to alternative methods of funding, like hospital foundations and gift shop operations.

Recently, Gov. Terry Branstad declared 50 counties medically underserved, which will allow them to receive more Medicare funds. Boattenhamer says this will help these hospitals to attract more physicians because the hospitals can be assured income.

FARM BUREAU NEWS SUMMARY

Trade package

After nearly two years, negotiations on the North American Free Trade Agreement were completed recently and approval of those negotiations will be making it's way through Congress.

Both the U.S. and Mexico agricultures are expected to benefit from increased trade between the two countries.

Plans are to phase in the free trade agreement over 15 years which will limit the expansion of both exports to Mexico and imports from Mexico in the most sensitive commodities.

Congress has 90 days from the time they receive the agreement to study it and work with the administration to draft implementing legislation before the trade pact is formally signed.

Congress then has another 90 working days to pass that legislation under "fast track" provisions which means that no amendments are allowed.

It's unlikely that the agreement could go into effect any sooner than January 1994.

Auto insurance

Imagine how you'd feel if your two-year old car was badly damaged in an accident. Imagine how happy you would be if you knew that the car could be replaced with a brand new car!

Farm Bureau members can purchase special auto coverage that includes auto replacement coverage.

This unique coverage enables you to replace a car that's been badly damaged. It covers more than just the book value of the car.

With auto replacement coverage, Farm Bureau will replace a severely damaged vehicle with a similar new vehicle if the cost of the repair plus the salvage value exceeds the cost of a similar new vehicle.

When the vehicle can be repaired for less than the cost of a new similar vehicle, the repairs will be made or a cash settlement will be paid to cover the cost of repairs.

However, the most Farm Bureau will pay is the lesser of the reasonable cost of repair with parts of like kind and quality or the cost of a similar new vehicle, less the deductible.

For example, if the cost to repair damage is $5,000 – Farm bureau will pay to repair the vehicle.

However, if the cost to repair the car is $16,000 and the salvage value is $2,450 (total = $18,450) and the cost of a new similar vehicle is $17,600 – the client will receive a new vehicle.

Auto replacement coverage is available for 1990 and newer vehicles.

Losses from theft, larceny or fire will be settled at actual cash value.

Farm Bureau offers members toll free calls to R.N.

A 24-hour health care information service, Farm Bureau NurseLine, is available to Farm Bureau members who have any of Farm Bureau's Blue Cross and Blue Shield of Iowa (BCBSI) health care coverage plans.

Farm Bureau NurseLine offers access to health care information 24 hours a day, seven days a week. By calling a toll free number, persons have the option of talking to a registered nurse or listening to prerecorded messages on general health care information.

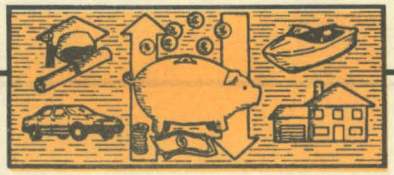
The nurse who answers is specially trained to discuss a variety of health care issues, including identification of symptoms; explanation of medical procedures, tests or terminology; advice on basic first aid; and many others.

The nurse at Farm Bureau NurseLine can also help determine if there is a need to see a doctor. And all information given to the nurse is confidential.

In addition, the Farm Bureau NurseLine offers prerecorded messages on various general health-related topics. Some of the prerecorded topics include common illnesses and disorders; digestive disorders; women's and men's health; and children's health.

To reach Farm Bureau NurseLine, members with BCBSI health care coverage may call 1-800-442-9292. Callers must give their BCBSI number.

The Farm Bureau NurseLine is offered at no charge, and there is no limit to the number of calls that can be made.



FINANCIAL PLANNING

Everyone should have an estate will

By Jim McCarthy

What would happen if you died tonight . . . and you had no will?

McCarthy

Preparing a will may not seem to be the most important thing you need to do. But not having one may create more problems than you might think.

Without a will, your surviving family could find themselves financially burdened with unnecessary estate settlement costs including probate fees as well as state and federal death taxes.

However, with proper planning, you can ensure that there are enough liquid assets (cash or items easily converted to cash) to handle the various costs associated with your estate.

Having a will is also important in transferring your assets to survivors.

Specific belongings (i.e., jewelry, heirlooms, furniture, etc.) can be distributed to beneficiaries you designate using a special memo attached to your will.

If there is no will, your belongings will be distributed by the rules set forth in state statute . . . typically going first to a spouse.

If this is a second marriage for the deceased, the spouse receives only one-third and the children receive the remaining two-thirds.

If there is no spouse, your children would inherit your estate. And, if there is no spouse or offspring, your parents would inherit your estate . . . and the associated costs of settling that estate.

A will is also critical when your survivors include minors. Your will can stipulate who should act as a guardian for your children, when assets should be turned over to minors and other provisions regarding the care of minors.

If there is no will, the court must appoint a guardian.

Before meeting with an attorney to draw up your will, here are some things to consider:

List your assets and the approximate value of each.

Who should act as executor of your estate (handle the details of paying debts and distributing remaining assets to the beneficiaries)?

If there are children, who is best able to raise them? When should assets be distributed to children?

Who should be named as trustee to manage investments, pay taxes, make distributions, etc., from an established trust?

Do you want to make any charitable bequests (especially if it reduces your income and death taxes)?

In some instances, planning is important so that taxes can be reduced.

If your estate is worth less than $600,000, you will not be subject to federal taxes. With smart planning, a married couple can pass up to $1.2 million to their children with no federal taxes incurred.

Spouses are not subject to state inheritance taxes.

Children, however, are only exempt from Iowa inheritance taxes on the first $50,000 they inherit. Anything over that amount is subject to state tax on a sliding scale up to 8 percent.

The difference between planning and not planning, for example, can amount to approximately $160,000 additional inheritance on an estate of $1 million.

The other benefit of planning your estate is that people won't have to guess who you want to get what and when they should receive it.

Even though a will – and proper estate planning – can provide tangible benefits in terms of taxes saved and proper distribution of assets, the biggest benefit is peace of mind. – *McCarthy is associate counsel for Farm Bureau Federation and affiliated companies.*

RECIPES

Iowans like football tailgating

By Denise Bodeker

Tailgate-party hopper Dean McWilliams of Deep River, far left, finds long-time friend, Larry Arendt of Montezuma, grilling in a premium spot near the stadium at an Iowa football game.

Tailgating is more than a parking lot meal. For many fervent college football fans, tailgating is as important as the game itself. The dining alternative allows fans to socialize with fellow supporters, to share grilling tips, to swap recipes and relax before and after an emotion-rousing game.

Dean and Marie McWilliams, Deep River farmers, have spent the last 15 years communing at home games with fellow University of Iowa Hawkeye fans. Farm work has never kept them from a game. They pack an assortment of delectables which vary according to the weather and game time.

Dean says tailgating has grown since his high school days in the '30s when he used to hitchhike to the Iowa games. He said many people took sandwiches to the games, but he opted to buy a concession stand sandwich for about a quarter.

Today, a portable grill and great Iowa beef are the keys to the McWilliams tasty tailgates. They usually grill top sirloin steaks with homemade barbecue sauce.

A dill dip for raw vegetables and a caramel dip for fruit are staples.

The McWilliams love Iowa football, but their early arrival and simple tailgates also allow them to enjoy all the surrounding action.

The whole parking lot is plastered with black and gold school colors, flags, banners and other novelties, Marie says. She and Dean have added their contribution to the colorful crowd by having their lawn chairs restrung in black and gold.

"It's a big production," Marie says. "You would have to see it to believe it."

Following are some of their favorite tailgating recipes.

Ranch Dressing Crackers

Two-12 ounce bags of oyster crackers
¾ cup cooking oil
One package ranch seasoning (dry)
¼ teaspoon dill weed
¼ teaspoon garlic powder
¼ teaspoon lemon pepper

Warm the oil in a small saucepan. Stir in seasonings. Pour over crackers and mix well. Spread on paper towels to air dry. Store in tight container.

Frosty White Grapes

1½-2 pounds white grapes
1 pint sour cream
½ cup sugar
2 teaspoons vanilla
½ pound margarine or butter
½ cup brown sugar

Mix sour cream, sugar and vanilla together. Fold grapes into mixture. Pour into 9x13 pan. Bring margarine or butter and brown sugar to a boil in a small saucepan. Drizzle over grapes. Chill. Stir before serving.

Dill Weed Dip

⅓ cup mayonnaise
8 ounce carton of sour cream
¾ tablespoon of minced parsley
1 teaspoon dill weed
1 teaspoon accent
1 teaspoon Lawry's seasoning salt

No Cook Caramel Dip

1 carton soft cream cheese
¼ cup white sugar
¾ cup brown sugar
1 tablespoon vanilla

Stir well and refrigerate. Good dip for fresh fruit such as apple and pear slices, grapes, etc. May soak slices in fruit preservative mixture to keep from browning. Leftover dip may be refrigerated for a couple weeks after preparing.

Entertainment crop ripe for harvest

By Denise Bodeker

A few Iowa farmers do not have to worry about grain prices at the local elevator this year or any year. These farming entrepeneurs often hope to entertain their buyers as well as sell their produce.

They are Iowa's rare breed of an estimated 140 pumpkin producers.

Joy and Danny Carroll of Grinnell started growing pumpkins in 1983 as a family project with their foster children. Last year, with three children of their own, they planted eight acres of pumpkins and started Carroll's Pumpkin Farm southwest of Grinnell.

"One of the biggest thrills was seeing the whole eight acres full of bright orange pumpkins. It was beautiful," Joy says.

Joy says a decorated hayloft filled with music and plays, giant pumpkins strewn across the lawn for kids to climb on and a steady schedule of hayrack rides were a great hit.

The Carrolls also decorated the lawn with a totem pole, scarecrow and pig made of pumpkins and corn stalks.

Although they live in a rural area, Joy says she is surprised at the number of people who have not visited a farm. She says many families enjoy bringing their children and grandchildren out to visit their petting barn, with pygmy goats, chickens, calves and piglets.

Naomi Maahs of Adel, president of the Iowa State Horticulture Society, also draws in families during the fall with her harvest of pumpkins, gourds, Indian corn, straw bales and corn husks. Maahs says four years ago she added pumpkins to her Country Gardens fruit and vegetable stand.

She encourages schools to bring children to her farm to learn about the process of cultivation. She says it is a great learning experience for the children and it also brings in business when the children tell their parents about the farm.

Families particularly like picking their own pumpkins from the patch, Maahs says. She lends a red wagon to families while they search for the great pumpkin. Maahs says her best selling pumpkins weigh between 15 and 20 pounds and sell for about $5.

With Halloween approaching, many pumpkin producers across the state are pulling out their own bag of tricks to make the season memorable.

"I think for many it is one of those last outings you do with the family before winter," Maahs said.

As a part of her marketing effort she has a Pumpkin Days festival at her farm during the first weekend of October. Last year a local dance studio presented a tap show in the barn, an accordion player entertained visitors, rides were given on a Welsh pony and local clubs had a bake sale.

Fourth generation fruit and vegetable producer John Hoopes and his wife, Mary Beth, of Muscatine also take great pleasure in marketing their fall harvest. John said the whole family gets involved in the process. In the past his grandchildren dressed as Ninja turtles and beckoned highway travelers to stop and buy pumpkins.

He said local children love his wife's video creation Wanda the Witch, a harmless character who greets children at the end of a corn husk maize. Hoopes said each year they try to do something a little different to keep people coming back.

"It is really entertainment farming," Hoopes said of pumpkin producing. "Anybody can raise them, but you must have a market."

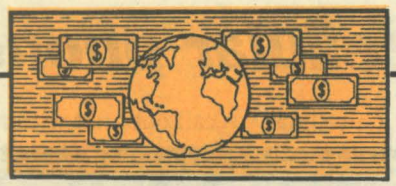
Gerald Houser of Tipton stumbled upon his market. He planted a patch of pumpkins in 1982 to cover some bare ground between pine trees. A bus load of eager students noticed the ripe pumpkins as their school bus passed Houser's home and he decided to give the pumpkins to them for free. He continued to do so until a man stopped to get a truck load.

"It was at that point that I knew there was a market for them," Houser said.

Eventually he bought a greenhouse and added herbs and perennials to his horticulture venture. Last year he planted 50 acres of pumpkins and sold about 100,000 to locally.

"I am doing something now that I will never have to retire from. It is probably the hardest work I have ever done, but I am my own boss," Houser said.

Pumpkins were slow to mature this season, Houser says, because of the unusually cold weather throughout the summer. He says pumpkins that usually ripen at the end of August did not start to turn orange until September.



THE ECONOMIC CLIMATE

An opinion

Politics is splitting the tax pie

By Dick Warming

Political seasons are silly seasons. If the U.S. economy were not at such a critical intersection, much of what you hear from candidates mouths would be hilarious.

Warming

Instead, a cold shiver will pass through your body as you work through the implications of their positions, add up the various pieces, and ponder the law of unintended consequences.

On taxes: A new buzz word is now making the rounds in the campaign, that is to "invest" in this or that supposedly salutary project. The source of those "investment" funds is never mentioned. It is never explicitly stated, but many political candidates firmly believe that the U.S. is an under-taxed nation, and that top income earners do not pay their fair share.

A study done by Gary and Aldona Robbins (former economists for the U.S. Department of Treasury) for the National Center for Policy Analysis, a non-partisan research institute, undercuts this notion.

The top 10 percent of income earners currently pay more than one-half of all U.S. income taxes. Furthermore, the top one-half of income earners pay more than 90 percent of all income taxes. Those who occupy the bottom one-half of income earners pay 5.5 percent of income taxes.

The fairness issue also surfaces in any discussion of taxation of capital gains. As the Robbins point out, and many other economists agree, by selectively lowering tax rates, governments can actually collect more total revenue. Every time the rates have been lowered, tax payments made by the wealthiest taxpayers have increased.

The converse is also true. In 1981, when the highest marginal rate was 70 percent, the wealthiest 1 percent paid 18 percent of total income taxes.

In 1988, at a tax rate of 28 percent, their tax share had increased to 27 percent.

In 1986, 26.9 percent of all income taxes paid came from filers with gross incomes of $100,000 and up. In 1989, this class of taxpayers provided 35.9 percent of total income taxes.

Recently, advisors to the President indicated that he could create a de facto capital gains tax differential by administratively ordering that gains on the sale of an asset be indexed for inflation.

On debt: The American debt binge, suffered under the horrible Reagan years, and the equally irresponsible Bush regency, have brought America to ruin, or so it is said.

Paul Craig Roberts, in a recent issue of National Review, points out that statistics from the Organization of Economic Cooperation and Development (OECD) show nothing unique about American debt, particularly when compared to the Group of 7 nations making up the developed world.

These numbers show that U.S. public debt as a share of gross domestic product is below the G-7 average, corporate debt is the lowest of the G-7 countries, and household debt, while about the G-7 average, is below that of Britain and Japan.

Roberts asks, if we are so dependent upon them to finance our deficits, who is financing theirs?

All programs now being proposed by the presidential candidates to "get this country moving again" entail government spending (or investment, if you will) and no new taxes, except for those to be imposed upon millionaires. At the same time, they insist that they will do all of the above, and reduce the budget deficit.

On common sense: Although the American voting public seems to have it all and not pay for it through higher taxation, it knows intuitively that the mutually exclusive goals of increasing government services and reducing deficits is not achievable. The issue will come down to the choice between the candidate who proposes to redistribute the current pie and the candidate who can convince the voters that the pie can grow.

It may be that elemental.—*Warming is Investment Vice President for the Farm Bureau Family of Financial Planning Services.*

Farmers in touch with cellular phones

By Denise Bodeker

The next time you are driving by a field, do not be surprised if you see your farming neighbor making an important business call from a cellular phone. Hi-tech communications are thriving in Iowa's farms. Cellular phones and two-way radios are just a few innovations helping farmers to stay on top of their business.

Carson farmer Gary Goodman says his cellular phone has been a key tool in his 45-mile radius farming operation. A few men who hauled corn for him had cellular phones and they convinced Goodman to buy one two years ago.

He says he is very careful to use the phone only for important calls to help keep the service costs down. His average monthly bill during planting and harvesting runs around $150.

"It's well worth the money because of the time I save," Goodman says. "We farm so many places far from home. It is really convenient to be able to call a repairman about a breakdown or to check on parts without having to run home first."

Cellular phone distributors and branch manager of U. S. West Direct Randy McCutchan says the price of cellular phones has dropped dramatically since they were first sold in 1984. A hand held unit that sold for $5,000 eight years ago, today costs about $300.

Farmer and part-time photographer Dave Hopp of Glenwood says the cellular phone he bought 3½ years ago has saved him from hundreds of miles of unnecessary travel and wasted fuel. He often calls his studio from the field to check if settings have been cancelled, Hopp says.

"I used to get a kick out of these people on the interstates with a phone glued to their ear. Now that I have one, I realize they are very practical," Hopp says. "It is not a prestige item."

Hopp says the cellular phone is a comfort in an isolated area because he knows that help can be reached immediately if an emergency occurred. For this reason, he pointed out a cellular phone might help farmers with medical conditions continue farming.

Brad Yeager of Ottumwa uses a two-way radio, for communication in the field with his dad, Clark, and their help. Brad says he likes the privacy of his cellular phone when talking to a broker or banker.

Brad advises farmers who are considering buying a cellular phone to look around because cellular service and the phone itself are usually sold as a package. Some services charge by the month for the phone and others require a complete payment for the unit during the first month, Brad says.

He bought a two-year contract at $70 per month which includes the phone cost and local cellular service, reaching six counties. Brad says talking on the cellular phone is as clear as talking on a home phone.

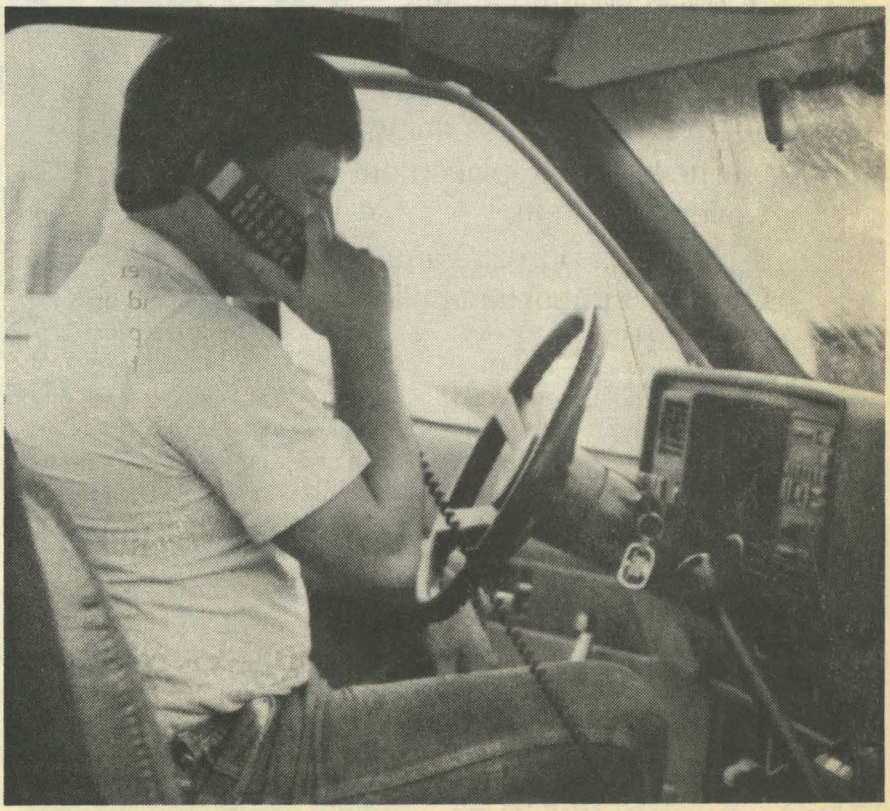
Clark likes the two-way radio because it transfers all his calls from home to his vehicle in the field and he can call out on it within a 24-mile radius, depending if he is in a valley or on top of a hill.

He says it is also very handy when he wants to talk to his workers.

Dan DeCarlo of Des Moines' Electronic Engineering says unlike a citizens ban radio, people do not have to listen to every conversation on the line with two-way radios. People, however, do have to close the line to hear what the calling party is saying.

Larry and Ellen Kinsinger, also of Ottumwa, bought a two-way radio because it is more reliable than a CB and Larry can make calls to farm service people directly from the field, Ellen says. They bought a paging system so that Larry knows when a call is directed to him.

"It takes a little bit of getting used to," Larry says. "Some people who call me don't realize I cannot hear them if they start talking while I have my transmitting button on, but they figure it out eventually."



Cellular phones have made conducting farm business easier and more reliable, says Ottumwa farmer Brad Yeager.

If it doesn't pay to fix your car, we'll fix you up with a new one.

Farm Bureau Auto Replacement Coverage

If your car was damaged beyond repair, would your insurance policy allow you to replace it with a brand-new one just like it?

It would if you had Farm Bureau's Auto Replacement Coverage. Very simply, if the cost of repair is more than the cost of a similar brand-new car, we'll buy it for you.*

Protects your car and your investment!

Call your Farm Bureau agent today and ask about our new Auto Replacement Coverage option.

The Farm Bureau Family. Our most important policy is caring.

*Coverage available for 1990 and newer autos. See your Farm Bureau agent for complete details.

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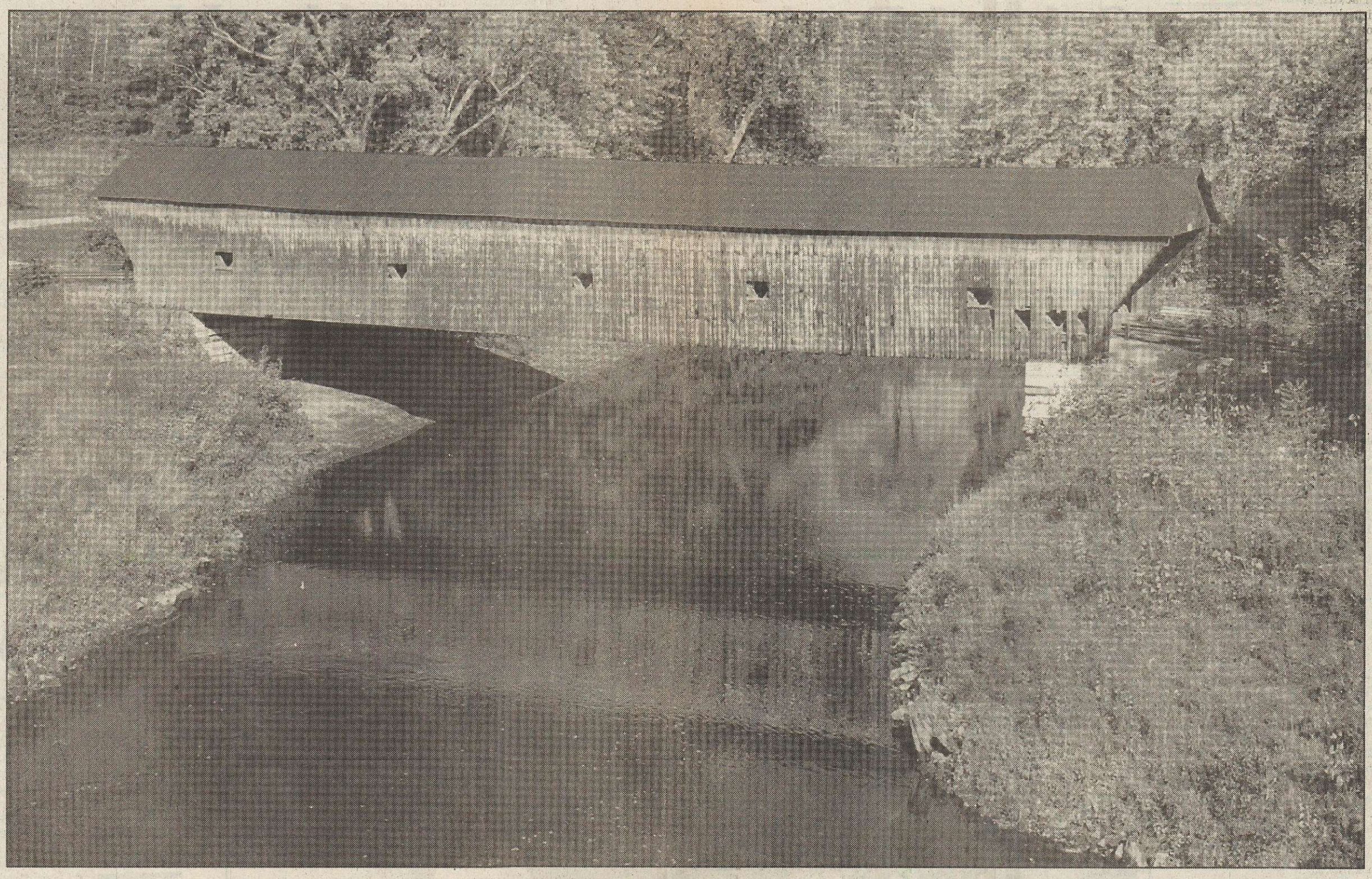
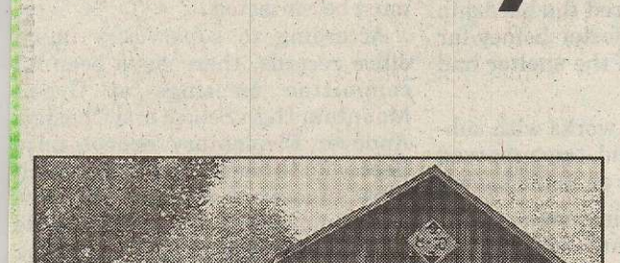


A view of the Hammond Bridge in Pittsford.

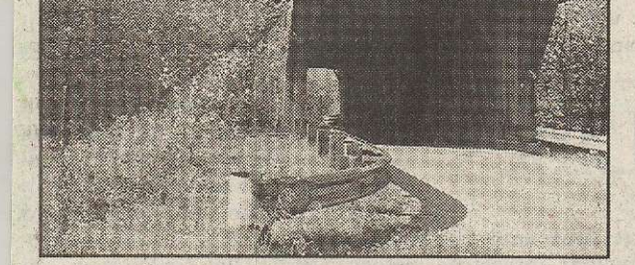
The Bridges of Rutland County

Story and photographs by Ed Barna

The Depot Bridge in Pittsford.



The Cold River Bridge in Cuttingsville.



The Sanderson Bridge in Brandon.

In the runaway best-selling novel "The Bridges of Madison County," a National Geographic photographer goes looking for the seven covered bridges of a county in Iowa. Six are easy to find; it is in looking for the seventh that he encounters the love of his life.

Rutland County, too, has seven covered bridges: four in Pittsford and one each in Brandon, Clarendon and Cuttingsville. But it can go Madison County one better: There is also a mystery bridge of sorts, in Rutland Town, no longer spanning a stream like the others, but perhaps more securely preserved for that reason.

And Madison County never had anything like Nicholas Powers, a Pittsford and Clarendon covered bridge builder who achieved national fame for his work. The story of how he constructed the nation's largest single wooden span may not have a love interest, but it makes up for that in real-life heroism.

Recently I had the opportunity to teach an Elderhostel course on covered bridges at the College of St. Joseph, which gave me the chance to learn more about these classic examples of Yankee ingenuity.

Like many native Vermonters, I had taken covered bridges for granted until fairly recently. Not so the senior citizens taking the Elderhostel mini-courses, thoughtful and highly literate people who shared perspectives from Texas, Louisiana, Minnesota and California.

It would be easy to underestimate the depth of feeling many visitors have for covered bridges, and assume that the people piling out of cars to photograph them in all seasons merely regard them as quaint and picturesque. Class writings taught me that among older Americans especially, covered bridges are a living link with a living history.

In one of the course members' statements on why they cared about the old wooden bridges, Margaret Dantley of Plymouth, Minn., eloquently wrote: "There is a sense of romance to covered bridges for some reason, and I think that's because we associate them with the era of our grandparents. Actually, I think that era was anything but romantic — it was an era of hard work, determination, self-sacrifice, and creativity. The bridges themselves include all of the above qualities."

Geraldine Hunt of Seminole, Texas, wrote: "I think of New England and Pennsylvania, early pioneers, romance, horses, wagons, soldiers and farms. I think of close-knit families and communities — a way of life that has passed from many areas of our country."

Hunt continued, "If the bridges have survived the problems of modern America, perhaps America can survive, too."

Sadly, many have not come down to us through the years. Floods, highway accidents, arson, and poor bridge repairs have all taken their tolls, and in some cases bridges have been replaced with concrete-and-steel structures because routine truck weights exceeded their capacities (now set at eight tons by state statute).

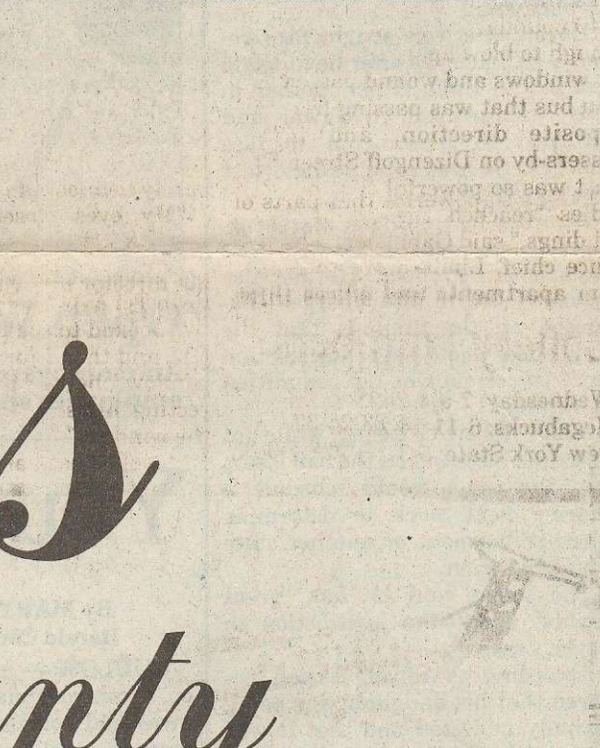
It was Jan Lewandoski of Stannard, probably the state's foremost covered bridge builder and restorer, who pointed out the problem of inadequate repairs

What carries the load in a covered bridge, he said, is the set of side timbers, interlocked with wooden pegs in arrangements known as trusses. Untrained local maintenance crews who take out miscellaneous angle braces to facilitate roof and floor work sometimes cause serious structural problems, he said.

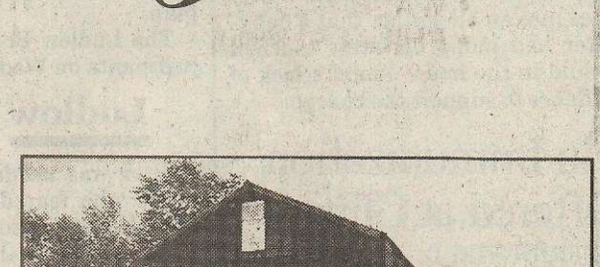
But historically, floods have been the bridges' worst enemy, Lewandoski said, particularly the spectacular flood of 1927. That deluge, the result both of long rains and 19th century deforestation during the sheep-raising craze, sent hundreds of bridges downstream, he said.

A few were so sturdy that they were towed back and replaced on their footings, Pittsford's Hammond Bridge being one example. Rutland County's "hidden" bridge, now a town highway department storage shed on the east side of the road from Rutland to East Pittsford, was similarly rescued after a flood caused by a failed dam in Chittenden in 1947 tore away the Twin Bridges.

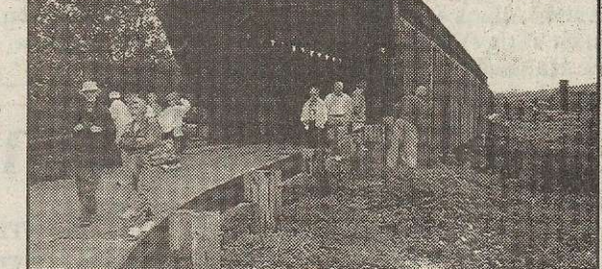
(See Page 13: Bridges)



The Gorham Bridge in Pittsford.



The Kingsley Bridge in Clarendon.



The remains of the Twin Bridges in Rutland Town.

Bridges

Continued from Page 9

There were also many hundreds of uncovered wooden bridges, with their pairs of side trusses exposed to the weather, but few of these survived to see 1927, Lewandoski said. The whole point of covering bridges was to keep water off the timbers, he said — though in one case there had to be an exception.

National Geographic actually did run an article on covered bridges in July 1974, and it included a picture of Brandon's Sanderson Bridge. Author Ethel Starbird wrote, "Practical as the Model A chugging across it, this covered bridge at Brandon was put up to keep snow off, not to bring skiers and sightseers in."

Wrong, said Lewandoski, and covered bridge book authors Eric Sloane and Richard Sanders Allen agreed with him. In fact, old town reports often list a line item for "snowing the bridges:" shoveling enough snow inside them so sleighs could cross.

Sloane ("American Barns and Covered Bridges," 1954) and Allen ("Covered Bridges of the Northeast," 1957) talked with people who still remembered all sorts of covered bridge lore that is now passing into oblivion.

For instance, few people nowadays use the term "kissing bridges" for the darkened tunnels, which in horse-and-wagon times often served as tunnels of love. Actually, there was an original Kissing Bridge, at what is now the intersection of Second Avenue and 58th Street in New York City.

Covered bridges also served as play areas for children, especially during wet weather. They were long enough for the single-base version of baseball called one-o'-cat, and the upper timbers offered challenges to climbers and gymnasts.

Sometimes the younger kids would hide in the upper framework to spy on kissing couples. The story goes that one time, a boy lurking in the darkened bridge saw his sister Mehitabel coming, in the company of the young minister.

To his delight, he saw the wagon slow and the couple draw close. Then he heard the young man stammer out, "Marry, will you Hitty me?" — words that eventually achieved widespread fame, after they stopped bribing him to silence and indeed were wed.

But to those who have studied the history of covered bridges, such tales are less interesting than early 19th century America's surge of bridge-building and the remarkable designs created, often by relatively untrained builders. Since trusses could be patented, anyone who invented a sturdier design that was easier to construct stood to reap substantial benefits.

The most successful design, used in all seven Rutland County bridges, was the Town lattice. It took its name from designer Ithiel Town, who patented it in 1820.

Its criss-cross arrangement of timbers could be easily assembled by ordinary carpenters. Indeed, advertising agents said it "could be built by the mile and cut off by the yard."

Constructed on the riverbank, the trusses would then be eased out over a temporary scaffolding similar to a railroad trestle bridge. Then came the great moment, when the props were knocked out and everyone watched to see if the structure would hold its "camber," the slight upward arch characteristic of a sound bridge.

Powers, born in 1817 in the southwest part of Pittsford, apprenticed under local Town lattice builder Abraham Owen, and did so well that he was given the job of bridging Furnace Brook at Pittsford Mills (at the intersection of Routes 7 and 3) before he was 21. When the bridge had to be replaced 96 years later, it was still strong enough to support the state demolition-and-construction crew's 20-ton steam roller.

While not primarily a designer, Powers in 1854 came up with a unique design for the 228-foot, two-lane span over Schoarie Creek in North Blenheim, N.Y. Sidewalk superintendents insisted that it would crack and crumble, and called it Powers' Folly.

For an answer, Powers climbed to the roof, said, "If it falls, I'll go with her!" then walked out along the ridgeline. When the scaffolding was knocked away, the bridge creaked and sagged — a fraction of an inch. It's still there, though it no longer bears traffic.

In 1866, Powers was called to Maryland by engineer friend George Parker when a college-educated team failed to come up with a design for an enormous railroad bridge. On his arrival, Powers was asked how long the job would take.

Powers looked at his watch — it was 9:45 a.m. — and replied, "I'll give it to you after I've had my lunch." He did, it was built ahead of the deadline, it held, and Powers earned a $500 bonus.

Lewandoski said one reason more covered bridges weren't built today was that when modern engineers analyzed them using state-of-the-art formulas and computers, the result usually came back "they should be in the river."

There is the real wonder of our covered bridges: that they not only exist, but in many cases still answer that old Vermont question, how to get there from here.

The Cooley Bridge in Pittsford.

The Burlington Free Press

BUSINESSMONDAY

December 14, 1992

Christmas trees a bonus for some, year-round business for others

By Christina Kollander
Free Press Correspondent

At this time of year, the state's roads are sprinkled with Christmas tree stands for holiday shoppers searching for the perfect tree.

For some of the tree sellers, Christmas is a year-long holiday. Others sell to earn a little extra money for holiday gifts.

Year-round Christmas

For David Frizzell, the holiday season provides a big portion of his annual income.

Frizzell, a Colebrook, N.H., dairy farmer, also grows Christmas trees on his farm. Frizzell has traveled to the Champlain Valley to sell Christmas trees for three years.

"This is an important time of the year for us," Frizzell said, who owns the farm with his partner, Fred Morgan. "Quite a bit depends on December."

Frizzell said he tries to get what he can from his land. He comes to Williston every December and sets up his stand in front of The Green Machine on Vermont 2A.

Frizzell said the holiday season is a yearlong process for him. Trees need to be fertilized, pruned, picked and cut at certain times each year.

"It's an awful lot of work," he said. "You have to make sure your act is together."

Christmas trees also are a way of life for Cecil Morse, who owns X-Mas Tree Farm in Cabot.

Morse said he sold close to 1,500 trees this year wholesale that were shipped to Brattleboro, New Hampshire and New York. He is selling 200 trees at his stand, in an empty parking lot on Barre-Montpelier Road.

As a result of the recession, Morse said, he has had to lower the price of his trees each year.

"The trees we have here are premium, but people don't want to pay," he said.

The job is sometimes discouraging, Morse said. Monday, he sold three trees in the morning, but the afternoon was quiet. But he said he sold 70 on a recent weekend and expected Saturday and Sunday to be his busiest days of the season.

ADAM PIKE RIESNER, *Free Press*

Rod Campbell of Colchester sells premium Balsam Fur Christmas trees at his new location on Shelburne Road, next to What's Your Beef II. Campbell hopes to sell 900 trees this season.

In Mary Simonetta's "real life," she is a pasta maker. Simonetta has been bringing her Christmas trees for a decade to the parking lot of the Tower Restaurant on Barre-Montpelier Road. With the purchase of a tree comes a container of pasta.

Simonetta said her trees are cut on her land in Berlin and that she has never had to throw a tree away.

For the owner of Cottage Street Pasta, most of her customers are regulars who come back each year. She even receives telephone calls at her shop, asking when she'll start selling the trees.

The cold weather does not bother Simonetta.

"I'm an outdoor person," she said. 'It's part of life for me."

Seasonal push

For father and son Rick and Rick Jr. Gutzmann, this year marks the first time they have sold trees in Burlington. The two, who earn a living as carpenters and loggers, find late fall and early winter a slow time in their business.

"Hopefully there will be a little Christmas money," the father said.

The Craftsbury residents brought 400 trees with them but want to sell close to 600 this season. They set up a stand on Williston Road, next to Ray's Mobile Homes.

"What's sold are the cheaper ones," he said. "I think that's standard."

Selling Christmas trees in December is an annual job for Randy Sanville, who

See **TREES,** *13*

Inside

Small business report

There are a number of ways small businesses can improve their tax picture by taking action before the end of the year. This week's report also offers tips for things you can do next year to reduce your tax burden. **Page 8**

Downtown up

Many of the nation's largest stores are finding that America's downtown business districts aren't dead yet. Retailers are thriving in some cities, including Boston and Chicago. **Page 13**

Profile

Jan Lewandoski wants to build a bridge to Vermont's past. **Page 9**

PROFILE

Good as old

Jan Lewandoski says Vt. needs more covered bridges

By Eloise Hedbor
Free Press Correspondent

Light snow whirls across the road, and underneath planks of the Longley Bridge in Montgomery, the Trout River ripples quietly, not yet encased in its wintry mantle. Just inside the entrance, sheltered by the covered bridge, Jan Lewandoski and his crew are giving this landmark what is probably its first major restoration since Jewett Bros. built it, 129 years ago.

Lewandoski once thought he'd be a college professor, "but it turns out I prefer blue-collar work."

He restores and rebuilds covered bridges, which he sees as one of the most practical examples of Yankee ingenuity.

Like most of this town's six other covered bridges, the Longley Bridge has enjoyed very little regular maintenance, assistant town clerk Maureen Lumbra said. But the town has contracted with Lewandoski for a $70,000 restoration project. When he's finished, the bridge might well be good for another century or more.

The design is a "Town Lattice Bridge" patented by Ithiel Town in 1821, and retains its structural integrity even if some of the timber weakens. Other designs might be stiffer or carry more weight, but this one is more durable and simple to build, said Lewandoski, who draws on his academic research skills to answer practical carpentry questions. He often spends time in the special collections section at the University of Vermont or in the Dartmouth libraries. Occasionally, in boxes of old papers, he'll find a gem, like plans for a covered bridge he might be working on, or a list of materials purchased for its construction.

More than looks

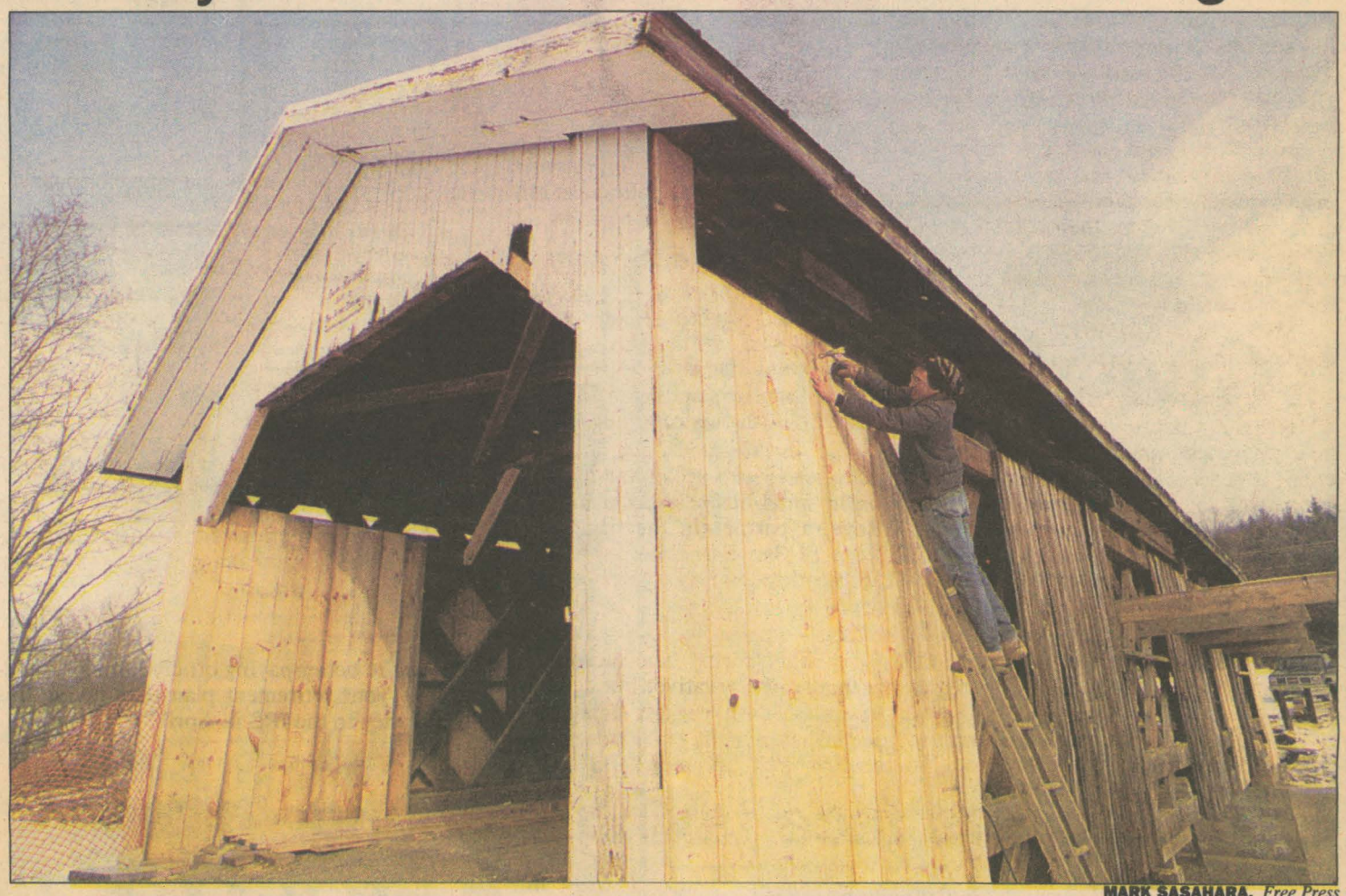
Covered bridges, Lewandoski says, are not just picturesque but practical. So practical that he is encouraging communities to consider building new ones. For small bridges, 60 to 80 feet in length, he said, "I can build a wooden covered bridge cheaper."

Not only does a covered bridge provide great tourist appeal, it also can be expected to last for generations, long after a metal or concrete span would have to be replaced.

Although old wooden bridges usually are rated for lower weights, there is nothing inherently weak about wooden bridges. "They actually will carry the weight," Lewandoski said. They can be built two lanes wide, although most of the old covered bridges are just a single lane.

This year, he completed construction of a covered bridge in Maine, 147 feet in a single span and rated for 40,000 to 50,000 pounds. He has built one in Ontario and says several Vermont towns are considering the idea.

Covered bridges are "not an American invention, but they came to full flower here," Lewandoski said. Covering a wooden bridge means the difference between a life of a couple of decades and one that might last for more than a century.



MARK SASAHARA, *Free Press*

Jan Lewandoski hammers a nail on the Longley covered bridge in Montgomery. Lewandoski specializs in building wooden bridges and restoring old ones.

The Lewandoski file

Name: Jan Lewandoski
Born: July 28, 1946 in Binghamton, N.Y.
Education: Undergraduate degree from Syracuse University; master's in political science from Northwestern University; doctorate studies in history and politics, McGill University
Occupation: Restoring historic structures including barns, churches and his favorite, covered bridges
Family: Married to Ann Lawless; two daughters, Mona, 12, and Julia, 9.
Residence: Stannard
Hobbies: Cross country skiing, hanging out with his children

Washed away

Covered bridges became popular in the New World, where timber was cheap and abundant. But even after much of the timber had been cleared, they retained their popularity through the 18th and 19th centuries. One of the last built was a covered railroad bridge erected in Wolcott in 1908.

As metal and concrete came into use, people began replacing their bridges with these modern materials. Lewandoski said the early belief was that these newer materials would last indefinitely.

In Vermont, the shift to metal and concrete was accelerated by the flood of 1927 that washed away all kinds of bridges. There were about 800 covered bridges in Vermont before the flood, and only about 300 survived.

Their number in the state has declined to 78, and pressure to replace the wooden spans continues because they usually are rated for weights that prevent their use by heavy vehicles.

Also, most are one lane wide. "They were made for a different period," Lewandoski said.

State skeptical

Some have been neglected for many years, yet they continue to stand. Most covered bridges in Vermont are 120 to 130 years old, Lewandoski said. One in Waitsfield is 159 years old.

Lewandoski thinks there is a revival of interest in covered bridges as people see that they outlast succeeding generations of bridges. Many of the bridges built after the 1927 flood are in critical need of replacement. Lewandoski hopes that some steel bridges will be replaced with covered wooden ones.

But state officials are cool to the idea.

"I wouldn't say we're absolutely opposed to the idea, but they're not practical to build," said Warren Tripp, structures engineer with the Agency of Transportation. "Some of these covered bridges are of a design that defies engineering study."

But the state is interested in helping to preserve those covered bridges that have survived. All but one are owned by towns, but the state is funding a study "to determine the best course of action for each site," Tripp said. That study, part of the agency's long-range planning, will cost about $10,000 per bridge and be completed in the summer of 1994. The results, including options and recommendations, will be turned over to the towns to help them determine the best course of action.

Survival assured

Because they are considered a tourist attraction and of historic value, "covered bridges are being repaired or restored, while more modern bridges are generally being replaced," Tripp said. "That is a basic assumption: that none will be removed."

In some cases, an alternative route with a modern bridge might be recommended to take some of the pressure off the older structure.

Lewandoski admits there always are some people in a town who dislike the inconvenience of a single lane and the low weight limits. But more and more, he

See **BRIDGES,** *11*

PROFILE

BRIDGES: Vermont needs more covered bridges

Continued from Page 9

said, those who treasure the spans outnumber their detractors.

For Lewandoski, covered bridges are both a chapter in American history and an occupation.

He spends two-thirds of his time working on covered bridges, and he would be willing to make it 100 percent.

"There's no insulation, no electricity, no plumbing, just pure carpentry. The locations are generally very scenic."

He can work year-round and says some work is more easily completed when the water under the bridge is frozen.

Life's work

Lewandoski said he has always been interested in carpentry. "My father was a carpenter."

But his fascination with covered bridges evolved from an interest in post and beam construction.

At first, whenever he worked with a particular project and encountered a puzzling problem, he said, "I'd go look at an old building."

Barns and churches were favorite haunts. The construction of barns usually is not concealed by interior walls, and the attics of churches reveal all the construction techniques 18th and 19th century builders used to span large spaces.

"Churches have roof trusses" and more similarity than differences compared to wooden bridges, he said. His carpentry work gradually focused on old barns and churches.

In 1987, when repairs were needed on the Windsor-Cornish bridge that spans the Connecticut River, Lewandoski was called in because of his experience with wooden trusses.

Lewandoski has been working with covered bridges ever since.

Working with an old bridge is partially a historic renovation project, and Lewandoski tries to match the old lumber.

"You can buy very few pieces at the local lumber store. Acquiring timber is one of the problems, or perhaps I should say challenges," he said.

Replicating the past

The Longley Bridge was built almost entirely of 3-by-11-boards. The lengths of timber are relatively short, "indicating to me they were already getting short in trees around Montgomery in 1863," Lewandoski said.

Most of the bridge's joints are made of wooden pegs, but nails were used to fasten the side walls and roof. He turns pegs to match the originals and uses

> *"It turns out I prefer blue-collar work."*
>
> **Jan Lewandoski**

boards of the hemlock and spruce, which is what the bridge's builders used.

And as he points to the new wood he has added to the Longley Bridge, he notes with satisfaction that with a few years of weathering they will be indistinguishable from the originals.

The finished product might be even a little better than new. He has added extra cross members to support the deck, reducing vibration and helping to keep this bridge standing for another century or so.

Ray FyI

NWBO

UNIVERSAL ENGINEERING CORPORATION

CONSULTING ENGINEERS

100 BOYLSTON STREET · BOSTON · MASSACHUSETTS 02116

AREA CODE 617 542-8216

July 20, 1987

State of Vermont
Agency of Transportation
133 State Street
Montpelier, VT 05602

Attn: Mr. Warren Tripp, Structures Engineer

Re: Open House
Powder Point Bridge
Duxbury, MA

Gentlemen:

Universal Engineering Corporation is pleased to extend a cordial invitation to you to attend a brief technical presentation and site walk on the Powder Point Bridge on August 4, 1987.

We are most proud of our involvement in the design and construction of this important structure, and wish to share this new technology with you for which you may find application to projects you may be contemplating, including rehabilitation of covered bridges.

Local historians claim this 2200-foot long bridge to be the longest timber bridge in the nation. The new bridge is certainly the first of its kind in this area. It is constructed entirely of prefabricated panels of imported tropical hardwoods.

Minimal use of metals consists almost entirely of galvanized dowels. The untreated hardwoods are resistant to marine borers, fire resistant, dense, and three times stronger than treated southern yellow pine.

We look forward to seeing you on August 4, and extend this invitation to additional members of your staff that may be interested. Please call and leave word with our receptionist or me at (617) 542-8216. I would be pleased to call on you if you are unable to attend.

Very truly yours,

UNIVERSAL ENGINEERING CORPORATION

Thomas R. Parello, P.E.
Senior Vice President

TRP:mjn
Job #0114
Encl.

UNIVERSAL ENGINEERING CORP.

OPEN HOUSE

POWDER POINT BRIDGE

DUXBURY, MA.

AUGUST 4, 1987

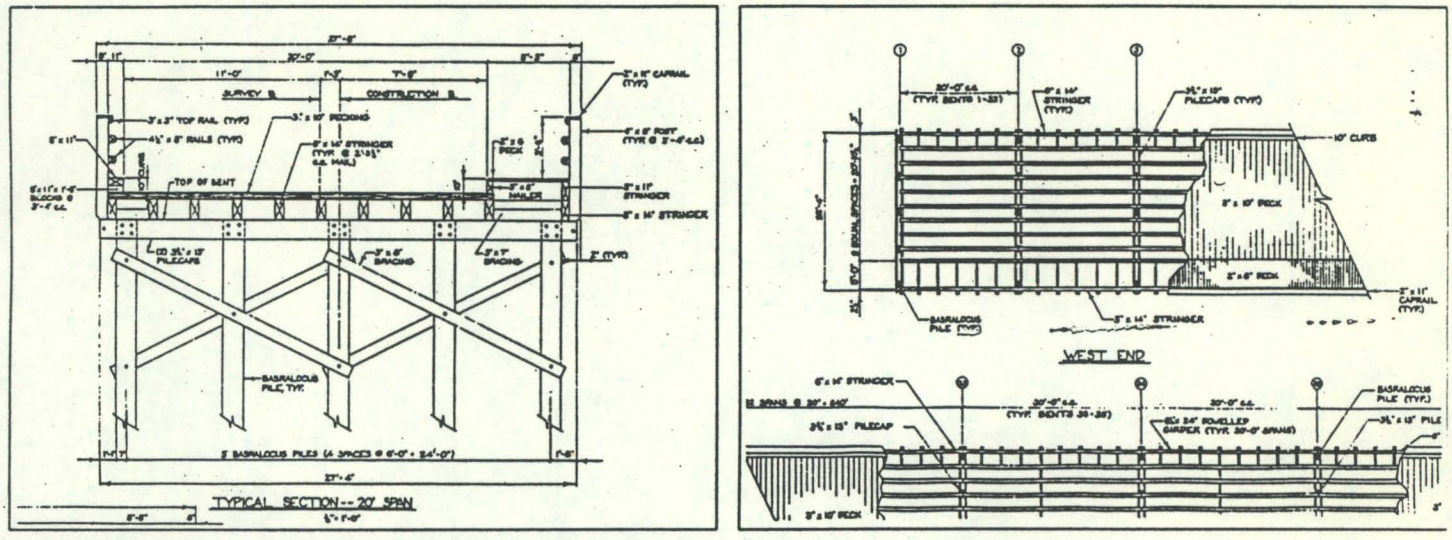
2200 FOOT BRIDGE CONSTRUCTED OF TROPICAL HARDWOOD

11:00 AM - SHORT TECHNICAL PRESENTATION

11:15 AM - SITE WALK

12:30 PM - COCKTAILS AND HORS D'OEVERS AT THE 1803 WINSOR HOUSE INN

PLEASE RESPOND BY JULY 24, 1987 AT 1-542-8216



Plans for the new Powder Point Bridge include a half-mile of Basralocus piles, covered by stringers and motor vehicle deck produced from ekki. The completed bridge will incorporate 600 piles, 30- to 53-feet in length, braced together in 20-foot spans.

The Powder Point Bridge is falling down

New one is going up with some wild woods

Story and photos
by MARILYN SPENCER

The fire-scarred, 2,200-foot oak and pine bridge over Duxbury Bay in Massachusetts is another century-old landmark falling victim to the demolisher's crowbar.

But the townspeople of Duxbury haven't abandoned their Yankee affiliation with wooden bridges; they're building another. It's just that the wood they'll use to reconstruct the massive Powder Point Bridge this winter won't come from the traditional U.S. resources, but from the wilds of West Central Africa and South America; Cameroon and Surinam to be exact.

Ekki (Lophira alata), from Cameroon, is a rock-hard, russet-brown wood that weathers to gray. It is also known by the trade name Bongossi, or the generic red ironwood. The wood is so hard, according to its supplier, that it's nearly impervious to spray paint and impossible to carve with an ordinary knife. Virtually vandal-proof, ekki will be used for the stringers, motor vehicle deck, walkway and guard rails of the new bridge.

Basralocus (Leguminosae papilionaceae), from Surinam, will be used for the piles. Basralocus is hard too, so much harder than the Southern yellow pine the townspeople had considered using, that an estimated 600 Basralocus piles will do the job that took 1,000 of the original piles, plus allow the weight limit for the bridge to be boosted from four tons to 15 tons.

And the cost for the Basralocus will be about the same as for the pine, said Gil Burns, highway director for Duxbury.

The Powder Point Bridge spans the swiftly moving tides of the channel between the mainland and Gurnet peninsula. Over the years, its piles, bents, stringers and deck planks have been replaced piecemeal due to damage caused by weather, wear and tides.

When a fire on the bridge in June 1985, destroyed 70 feet of the decking, and a close inspection by Universal Engineering Corp. of Boston, Mass., revealed serious piling and superstructure deterioration, the decision was made by a town committee to replace the bridge. Mostly for sentimental reasons, any material other than wood was not acceptable, Burns said.

The new woods were chosen for their resistance to infestation from marine organisms, their maintenance-free properties and their resistance to flame.

"On a scale of one through 100, with asbestos as one and dry red cedar as 100, Basralocus is about a 16," said Dick Drisko, vice-president of For-Tek, Inc. of North Billerica, Mass., the lumber company supplying the wood.

Drisko said ekki has slowly been gaining acceptance as an alternative to Southern yellow pine for use in decks, wharves and thoroughfares, especially in high-stress, excessive-wear areas. Both the year-old pedestrian wharf at South Street Seaport Museum in New York City, and much of Liberty Pier on Liberty Island, N.Y., are constructed of ekki.

Peter Johantgen, an architect for the Liberty Pier reconstruction project, said the wood was chosen because it will take the heavy wear caused by traffic visiting the Statue of Liberty, with few scrapes and scars. "We used Bongossi (ekki) over existing piles for decking on the arrival pier and canopy," Johantgen said. "The pier was to be made originally of Douglas fir, but Bongossi offered more desirable features at the same price."

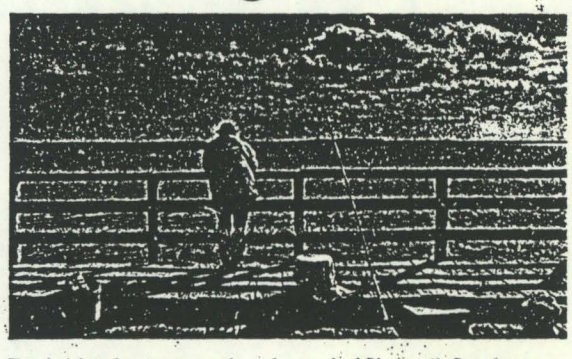
A crew of seven — far fewer than the number of hands needed in 1892 — will assemble the new Powder Point Bridge using forklifts and cranes to maneuver the heavy timber, said Tom Enwright, project engineer for Harbor Marine of Warren, R.I., the company awarded the construction contract. "We're tearing down the old bridge and will have the new one in by June," he said.

The piles are from 11 inches to 14 inches — square rather than the traditional round shape — and will be pile-driven to gravel bottom, or until the pile builds up enough friction to sustain a 10-ton test load.

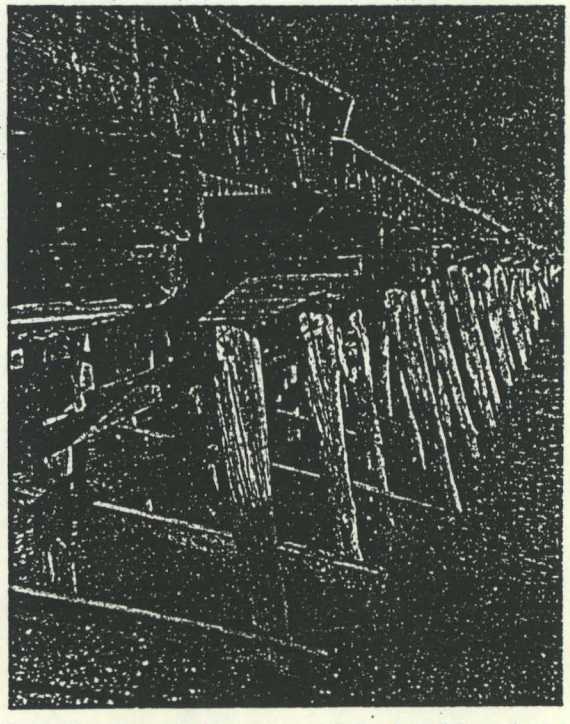
Milling for the new bridge's superstructure and the 30- to 53-foot piles was done in Norway, he explained, because specialized equipment (available only in that country) is needed to cut the excessively hard wood.

The dimensioned timber was shipped to the United States and is being fabricated in New Bedford, Mass., to form 110 spans 20 feet in length. Each span will contain deck timbers bolted to 11 stringers, blockings and curbs. In February, the spans are scheduled to be barged to Duxbury to await completion of pile placement.

The citizens of Duxbury will have their bridge in time for summer outings on the Gurnet, and it should be maintenance-free for decades, highway director Burns said. "It will cost $3 million — about $2.7 million more than the original, but it should last a lifetime."



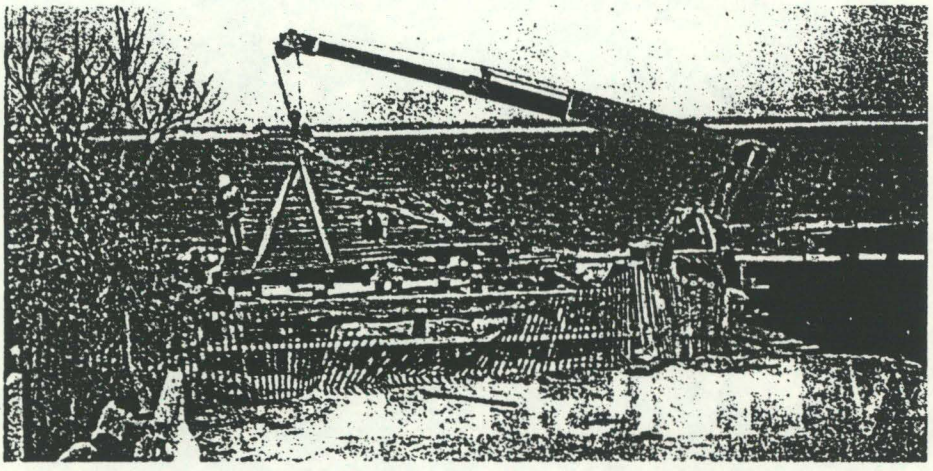
The bridge has spanned a channel of Plymouth Bay for more than a century.



Years of wear resulted in serious deterioration of the oak and pine pilings and superstructure.

Exotic woods defy damage

After fire repeatedly damaged its deck and marine borers feasted on its pilings, the 93-year-old bridge over Duxbury Bay in Massachusetts, one of the longest all-timber bridges in the U.S., is being replaced. It's still going to be wood, however.



Prefabricated section of *lophira alata* deck and stringers is installed on Massachusetts bridge.

Except for a higher center span, the new bridge will even look like its predecessor, but there is an important difference. The new span consists of two exotic woods. Instead of the old bridge's southern yellow pine, the piles of the 2,200-ft-long structure are *basralocus* (also known as angelique) imported from South America. The superstructure, including pile caps, stringers, deck and guardrail, are *lophira alata,* (also known as ekki or azobe) from Africa's Ivory Coast and Cameroon.

The imported woods account for $2 million of the $3-million project cost. "Steel or concrete could have been less expensive up front," says Gilbert L. Burns, Duxbury's town engineer. "But we wanted to retain the . . . landmark of our 350-year-old town."

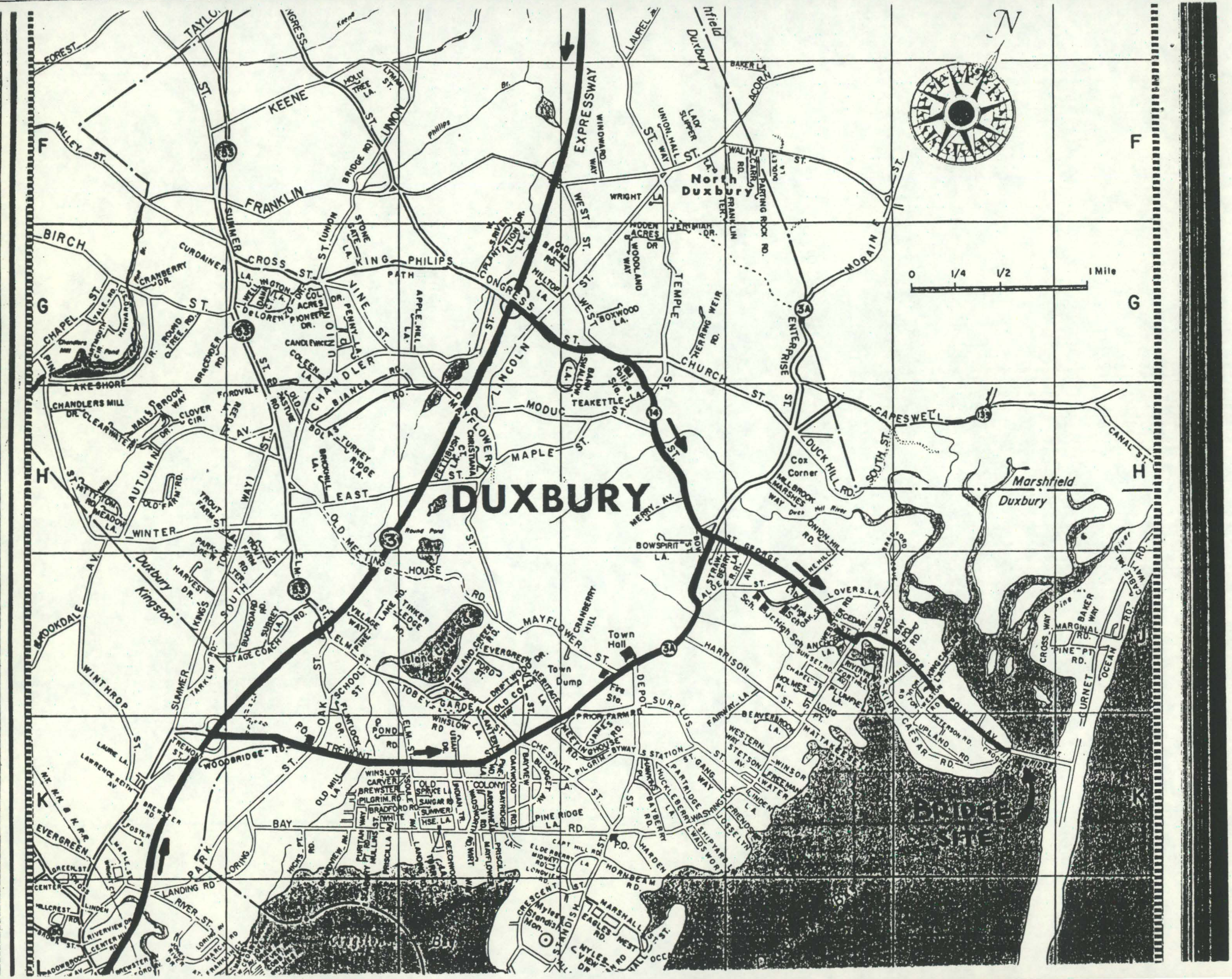
Bridge designer Thomas R. Parello, of Universal Engineering Corp., Boston, says that southern pine would have cost about $500,000 less, but in the long run the exotic woods will prove more economical. The new bridge is expected to be maintenance-free for at least 50 years. *Basralocus* is ideal for piles immersed in water—it does not need preservative treatment to make it impervious to marine organisms. *Lophira alata* is a dense, heavy wood resistant to flame. "And it is resistant to vandalism, too," says Parello. "It can't be whittled."

Contractor Harbor Marine Corp., Warren, R.I., has vibration-driven 555 rough-sided friction piles to a depth of 23 ft. This leaves 30 ft of pile between the mud line and the superstructure. The 30-ton-capacity piles are joined five to a bent; the 106 bents are 20 ft on center except for the 25-ft center span.

The 15-ton-capacity, two-lane bridge, with its pedestrian sidewalk, shortcuts a 5-mile circuitous route to connect Duxbury with an outlying community.

Parello's design makes minimum use of metal. Bolts hold the railing to the deck, and galvanized steel dowels hold the deck to the stringers. Bolts tie the bracing to the piles above the water line. "We can't drive spikes, the wood's too hard," says project manager Thomas Enwright. "We need carbide-tipped tools for drilling."

Audrey Troise, president of William G. Moore & Son, Staten Island, N.Y., which supplied the timber, says *basralocus* is the new decking of New York City oceanfront boardwalks. "Measured for fire spread, asbestos scores 0, white or red oak scores 100, douglas fir 107, but *basralocus* is only 49, and *lophira alata* only 21," she says. ■



N
DUXBURY
North Duxbury
EXPRESSWAY
BRIDGE SITE
Marshfield
Duxbury
Kingston
Town Hall
Town Dump
Fire Sta.
Cox Corner
P.O.
0
1/4
1/2
1 Mile
F
G
H
K
L
KEENE
FRANKLIN
BIRCH
CROSS
KING PHILIPS PATH
CONGRESS
CHANDLER
CHURCH ST.
CAPESWELL
MAYFLOWER
LINCOLN
MAPLE ST.
MODUC ST.
TEMPLE
WEST ST.
ENTERPRISE ST.
MORAIN
SUMMER ST.
WINTER
EAST ST.
OLD MEETING HOUSE RD.
TREMONT ST.
WOODBRIDGE RD.
HARRISON
SURPLUS
BAY RD.
ST. GEORGE
POWDER POINT AV
KING CAESAR RD.
GURNET RD.
WINTHROP
LANDING RD
RIVER ST.
PARK

MASSACHUSETTS HISTORICAL COMMISSION
80 Boylston Street, Boston, MA 02116
(617) 727-8470

To: Nancy Boone, VT Division for HP
From: Sally Zimmerman, MHC
Date: 2/6/86

Attached is a copy of the inventory form for our single chord Town lattice truss bridge (moved from Vermont). Let us know if it is as rare as we (with only 4 extant historic covered bridges) thought it might be. If you think it is exceptional enough for the NR (despite move), we'll nominate it. Otherwise, we won't.

Thanks for your help!!

DETERMINATION OF ELIGIBILITY (MHC OPINION)

TO: Sally Z

RETURN TO REVIEWER BY _____ (DATE)

FROM: Wm. Smith

DATE: 11/21/85

TOWN: Sturbridge

PROPERTY: OLD Sturbridge Village - interior Road over Quinebaug River
(NAME AND ADDRESS)

1. Does this property meet the criteria for NR eligibil

Eric Gilbertson
802 828 3226
Not Elig -
Moved to OSV
as part of
museum in
1951 (from Vermont)

☒ YES

☐ NO

A. Criteria
   a. events
   b. lives
   c. characteristics
   d. information

B. Local _____ State _____ Nation

2. Statement of Significance: OR Why not eligible?

1874 Town Lattice timber truss (covered Bridge)
The Bridge was moved from Vermont in 1952

The structure is very important because of its single-cord construction. (Only one in Massachusetts)

This bridge would be important anywhere!
* Rare Bracket Portal

* Bridge of this type (timber covered Bridge) were often moved.

☐ DOE LETTER WRITTEN

FILED IN ER FILE _____

_____ (DATE)

MDPW RECOMMENDATION - NATIONAL REGISTER ELIGIBILITY

Municipality	Street on	No.
Sturbridge	Old Sturbridge Village interior road/ arm of the Quinebaug River	7-30-50

Bridge:

Historic evaluation

Significant because:

1) Unusual or unique type	___
or rare survivor of common type	X
2) Early example of type	___
3) Design - Valuable contribution to bridge technology	X
4) Retains integrity	X
5) Builder known and important	___
6) Bridge historically important to area	___

Not significant because:

1) Common type	___
2) Post-1931	___
3) Design - no contribution to bridge technology	___
4) Integrity lost because of: a) alterations	___
b) disintegration	___
5) Builder unimportant or not known	X
6) No known significance in area	___

[X] Potentially eligible [ ] Not eligible

Comments:

One of 9 extant covered timber through truss bridges in Massachusetts, and one of only 5 dating earlier than 1900. Three of the 5 'historic' covered bridges are Town lattice trusses, the OSV bridge is the second-oldest of the three, and the only one to use the single-chord configuration

Moved from Vermont in 1951-52, and now an integral part of Old Sturbridge Village, one of the first and best "living history" open-air museums in this country

6 August 1985

S. Roper, MDPW Historic Bridges Specialist

MASSACHUSETTS HISTORIC BRIDGE INVENTORY

Municipality: Sturbridge District: 3

Street name/Rt. #: Old Sturbridge Village interior road

Over

Street name/Rt. #: arm of Quinebaug River

Bridge key #: PR1350050000 Photo ##s: 36: 14A-20A

Bridge plan #: S-30-50

Common/historic name: Vermont Bridge; Taft Bridge; Dummerston Bridge

Current owner: Old Sturbridge Village

UTM coordinates:

****

National Register status (insert date)

Entered: Potential:

Eligible: Non-eligible:

Field rating: (3) 2 1

****

Date built (source): 1874 (John Curtis OSV)

Date(s) rebuilt (source): moved 1952, moved again 1956 (R.J. Allen Covered Bridges)

Builder (source):

Designer (source):

****

Structural type/materials: 710

covered, single-web single-chord. Town lattice timber through truss. Vertical iron (?) tension rods (1 in each truss) at or near its mid-points; inclined iron (?) tension rods slope inward from upper chord ends to lower chord.

upper chord joints (lower chord not seen) all triple-pegged and bolted. Web intersections all double-pegged, those at mid-height are also bolted.

Overall length: ca. 70' Deck width/layout:

Skew: -

Main unit, # spans: 1 lengths: 65'

Approaches, # spans: - lengths:

Plaque: - location: -

Alterations, unusual features, comments:

According to John Curtis, OSV, no significant alterations were made to the bridge when it was moved and reassembled in the 1950s, and only the roofing & decking have been replaced since. He did not believe that any changes had been made in the trusses -- the question being raised as to whether the iron (?) tension rods are original.

A considerably lighter truss than either of the other Town lattices (S-10-12, H-8-12/W-5-2) in Mass., but consistent with its shorter span.

"Bracketed" portal is unique in Massachusetts

Visual quality (bridge and setting): High X Average ___ Low ___

Site integrity: Retained ___ Violated X Bridge moved twice

Describe: Pleasant rural setting, on a neck between two ponds in the recreated nineteenth hamlet of Old Sturbridge Village. Mostly wooded hillsides in immediate area, with mill buildings visible across the southern pond.

History of bridge and site:

Originally built in 1870 in Dummerston, Vermont, to carry a highway (eventually Vermont Rt. 70) over Stickney Brook. Then known as Taft Bridge. Presented by the Vermont Highway Department to Old Sturbridge Village in 1951. Disassembled and moved to Sturbridge where it was re-erected on a causeway built out into the Quinebaug River in 1952, under the direction of George H. Watson, OSV. Bridge was washed out in the hurricane of August, 1955, but was saved by being roped to trees on the Quinebaug's banks. In winter of 1955-56, the bridge was moved again to its present, safer location over the Village's narrow-waisted millpond.

Old Sturbridge Village was created by A.B. and Joel Cheney Wells, officers of the American Optical Co. of Southbridge, in the 1930's and '40's, as an open-air, 'living museum' village.

Sources: R S Allen, Covered Bridges of the Northeast, pp 70-71, 111.
D H No John Curtis, Old Sturbridge Village, phone conversation, 7-16-85
Plano No
RR No

****

Summary statement of significance:

Fourth oldest of 9 extant covered timber through truss bridges in Massachusetts, and one of only 5 such bridges dating prior to 1900 (the other 4 covered bridges in this state have all been built since 1950.) One of 3 of the 5 'historic' covered bridges utilizing the Town lattice truss design, and the only one of the three to utilize single chords. Distinguished from the four other 'historic' covered bridges by its portals, featuring a cantilevered gable visually carried on curved, boarded 'brackets'.

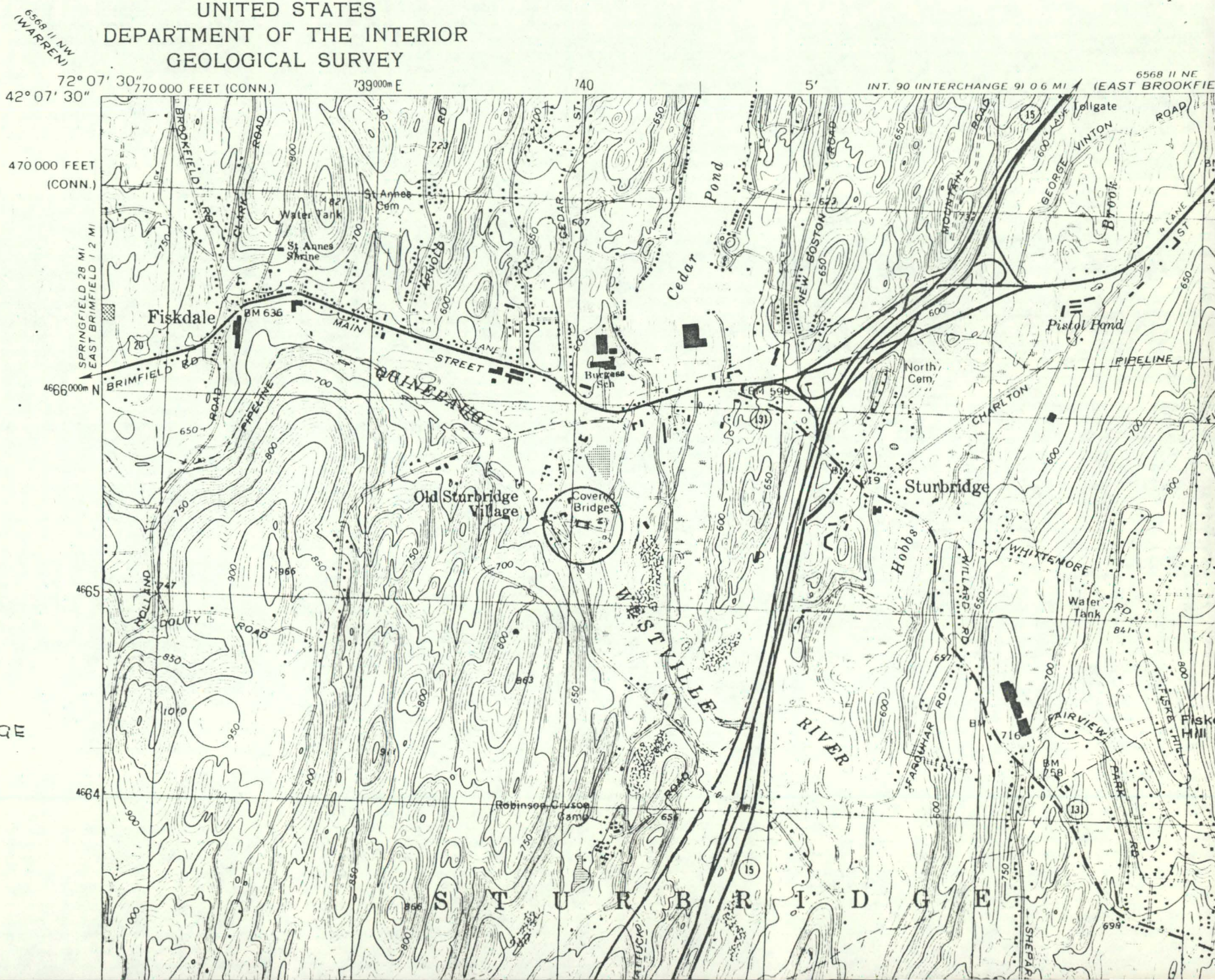
Although moved from its original Vermont site to Sturbridge in 1952, and moved again to its present site in 1956, the bridge appears (and is stated by John Curtis of OSV) to be very little altered structurally. As of today, the bridge is one of only 3 surviving examples in this state of what was the predominant covered bridge type in nineteenth-century Massachusetts.

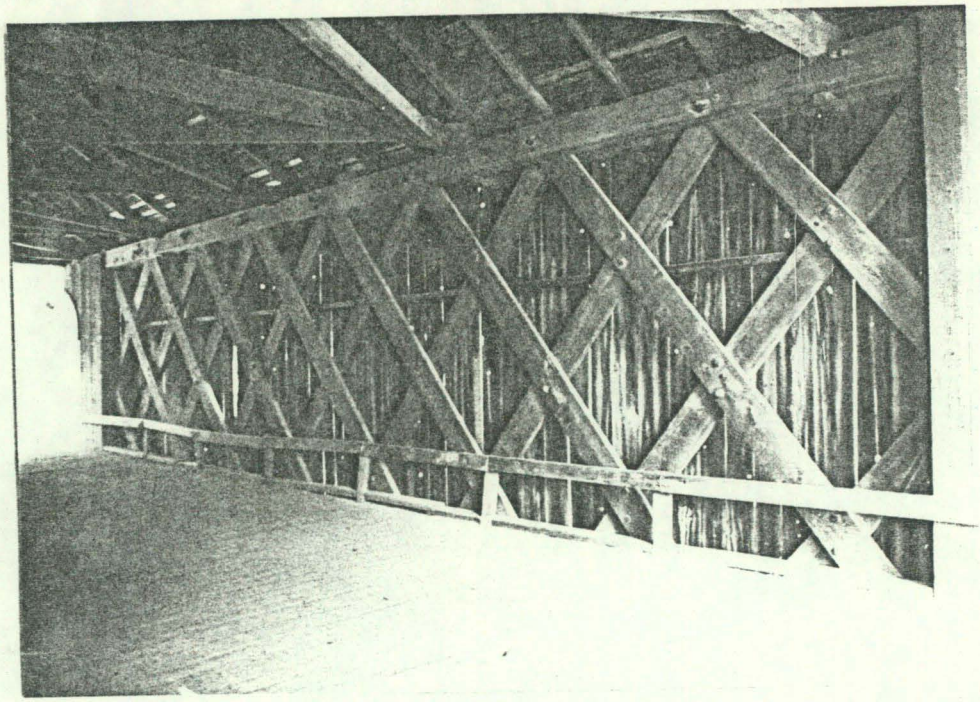
Now an integral part of the recreated Old Sturbridge Village.

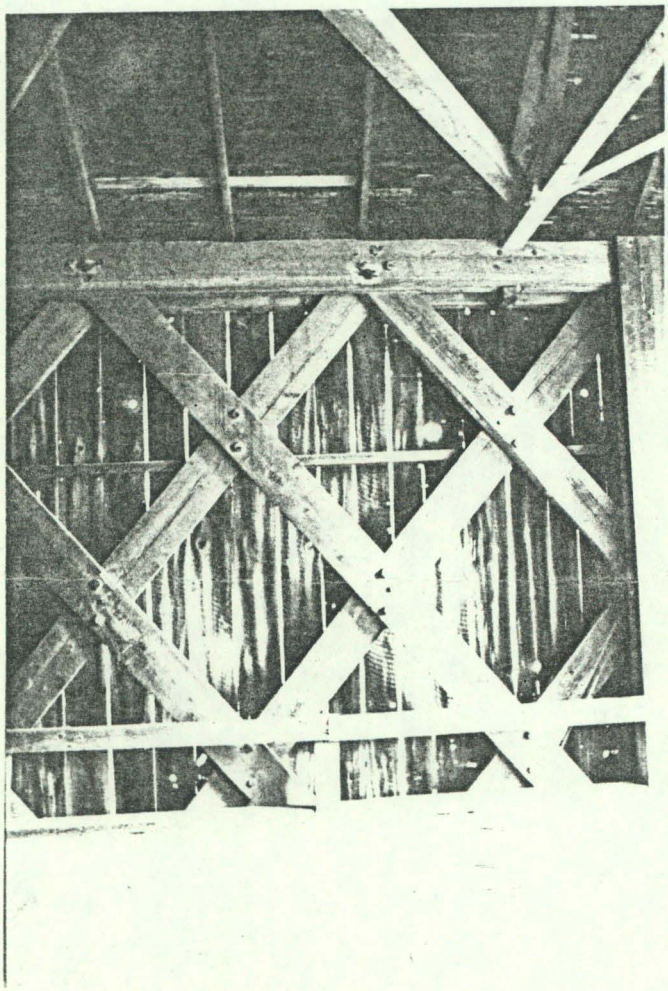
Statement prepared by: S J Roper MDPW Hist Bridges Spec. Date: 5 Aug 1985

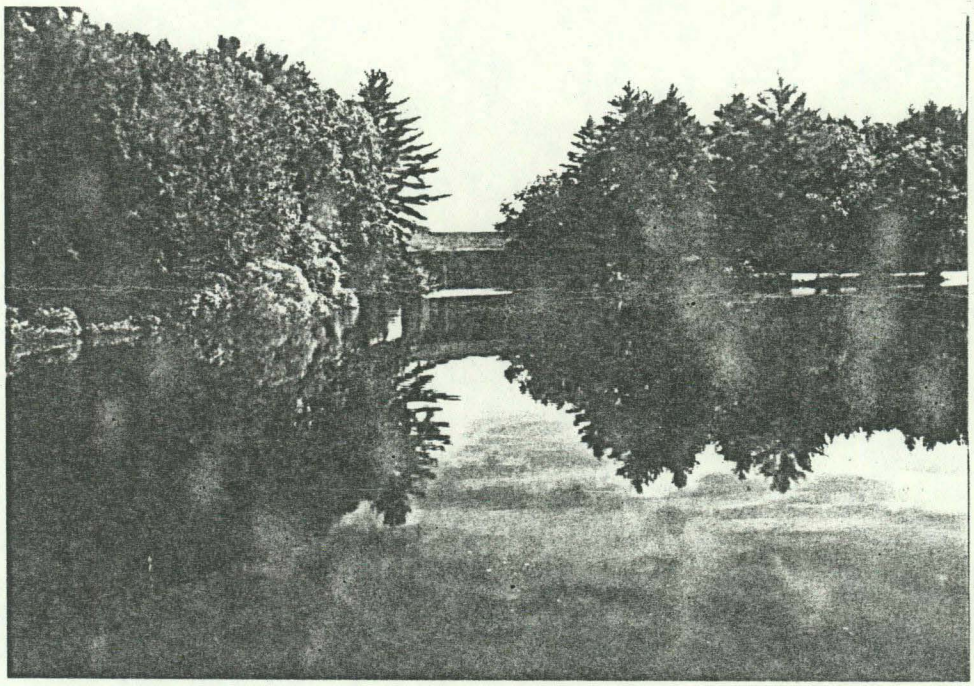
****

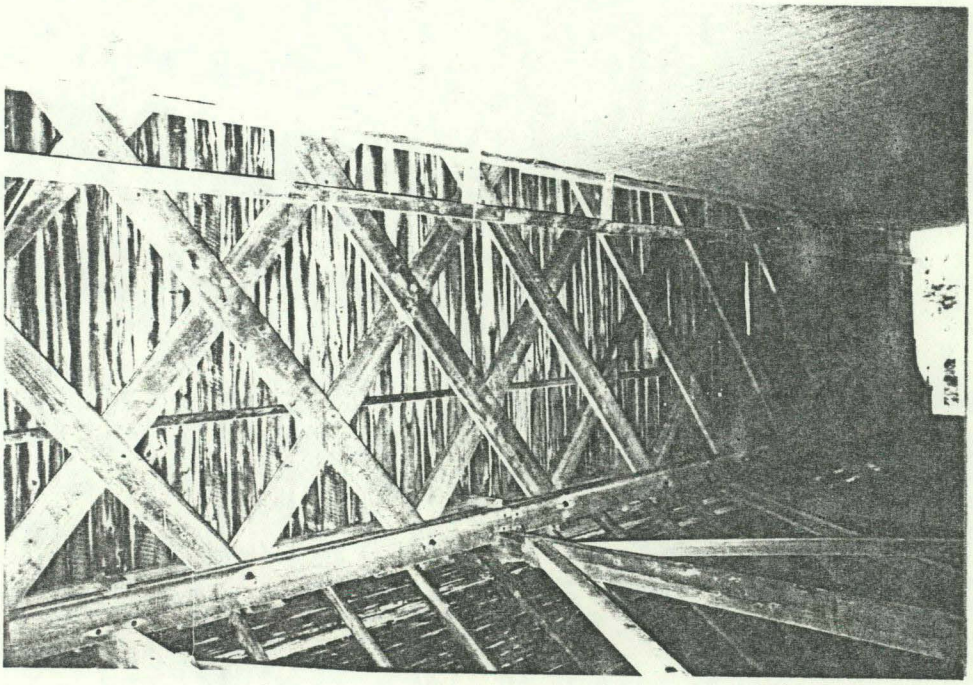
Field survey by: S J Roper Date: 17 July 1985

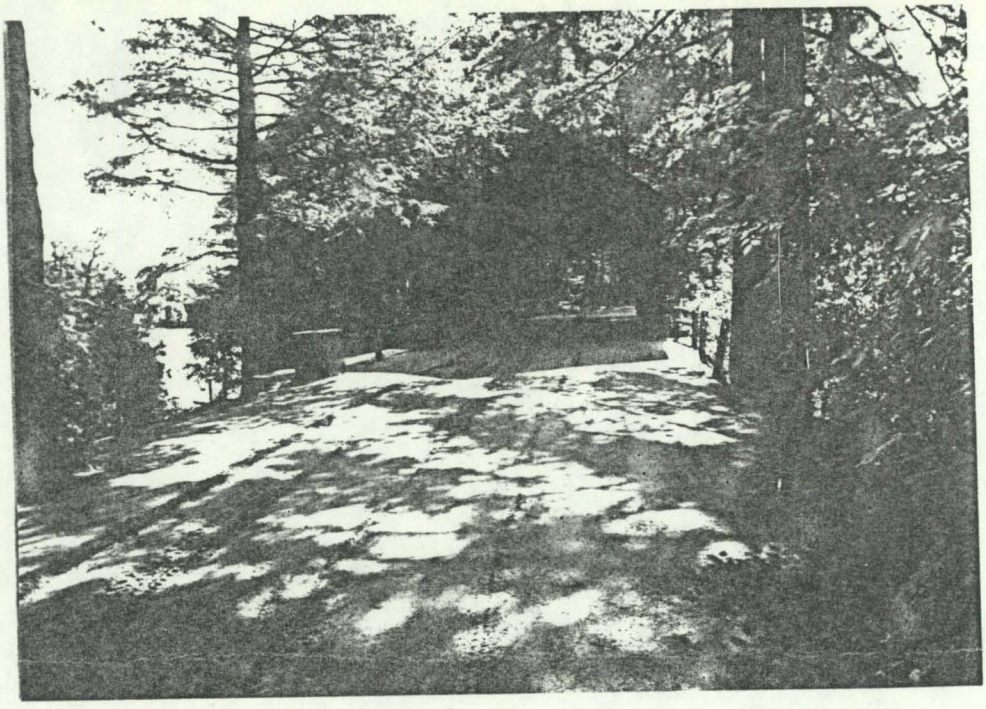

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
6568 II NW
(WARREN)
72° 07' 30"
42° 07' 30"
770 000 FEET (CONN.)
739000m E
740
5'
INT. 90 (INTERCHANGE 91 0 6 MI)
6568 II NE
(EAST BROOKFIE
470 000 FEET
(CONN.)
SPRINGFIELD 28 MI
EAST BRIMFIELD 1 2 MI
4666000m N
4665
4664
Fiskdale
BM 636
MAIN STREET
BRIMFIELD ROAD
QUINEBAUG
PIPELINE
BROOKFIELD ROAD
CLARK ROAD
Water Tank
St Annes Cem
St Annes Shrine
ARNOLD
GEDAR ST
Cedar Pond
NEW BOSTON ROAD
MOUNTAIN ROAD
GEORGE VINTON ROAD
Tollgate
Brook
4 LANE
Pistol Pond
North Cem
CHARLTON
Old Sturbridge Village
Covered Bridges
Burgess Sch
Sturbridge
Hobbs
WHITTEMORE
Water Tank
WILLARD RD
FARQUHAR RD
FAIRVIEW
PARK RD
Fisk Hill
HOLLAND
DOUTY ROAD
WESTVILLE
RIVER
Robinson Crusoe Camp
ROAD
SHEPARD
S T U R B R I D G E
7-30-50
SOUTHBRIDGE
QUAD.

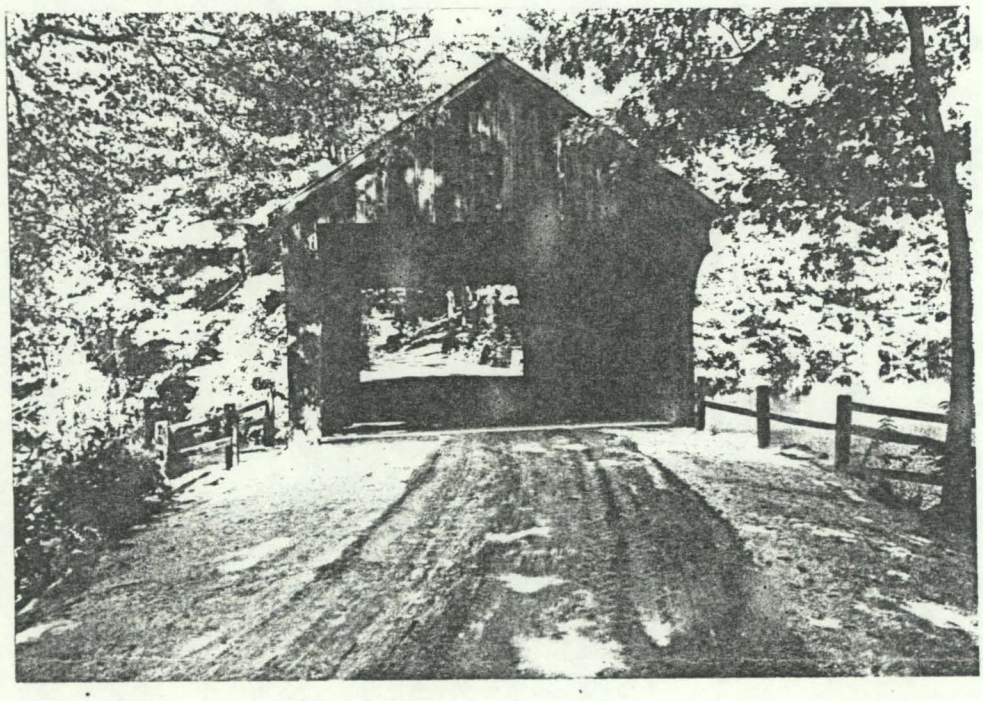


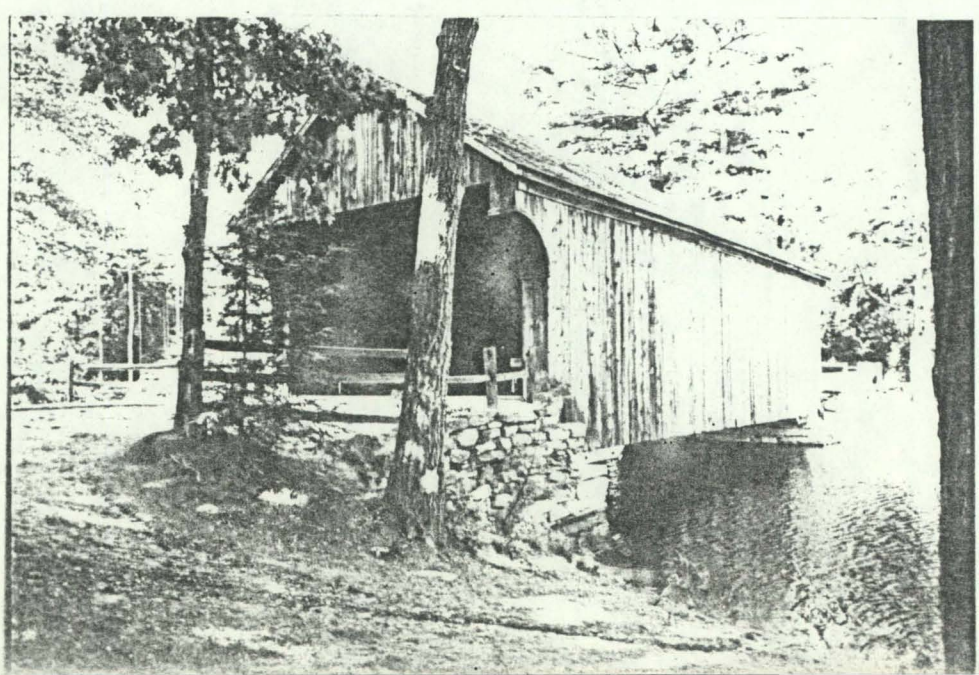












1874 Town Lattice Truss, Single Chord

Bridge	Sigle Chord	Double Chord	Unknown
Addison			
Cedar Swamp			✓
East Shoreham RR			✓
Halpin			✓
Pulp Mill			✓
Bennington			
Arlington Green			✓
Benn. Falls			✓
Henry			✓
Silk			✓
Caledonia			

call Warren Trip
call Neal Templeton at Bank

cov. bridges rare enough as artifacts to be eligible

VERMONT DIVISION OF HISTORIC SITES

COUNTY Franklin TOWN Montgomery

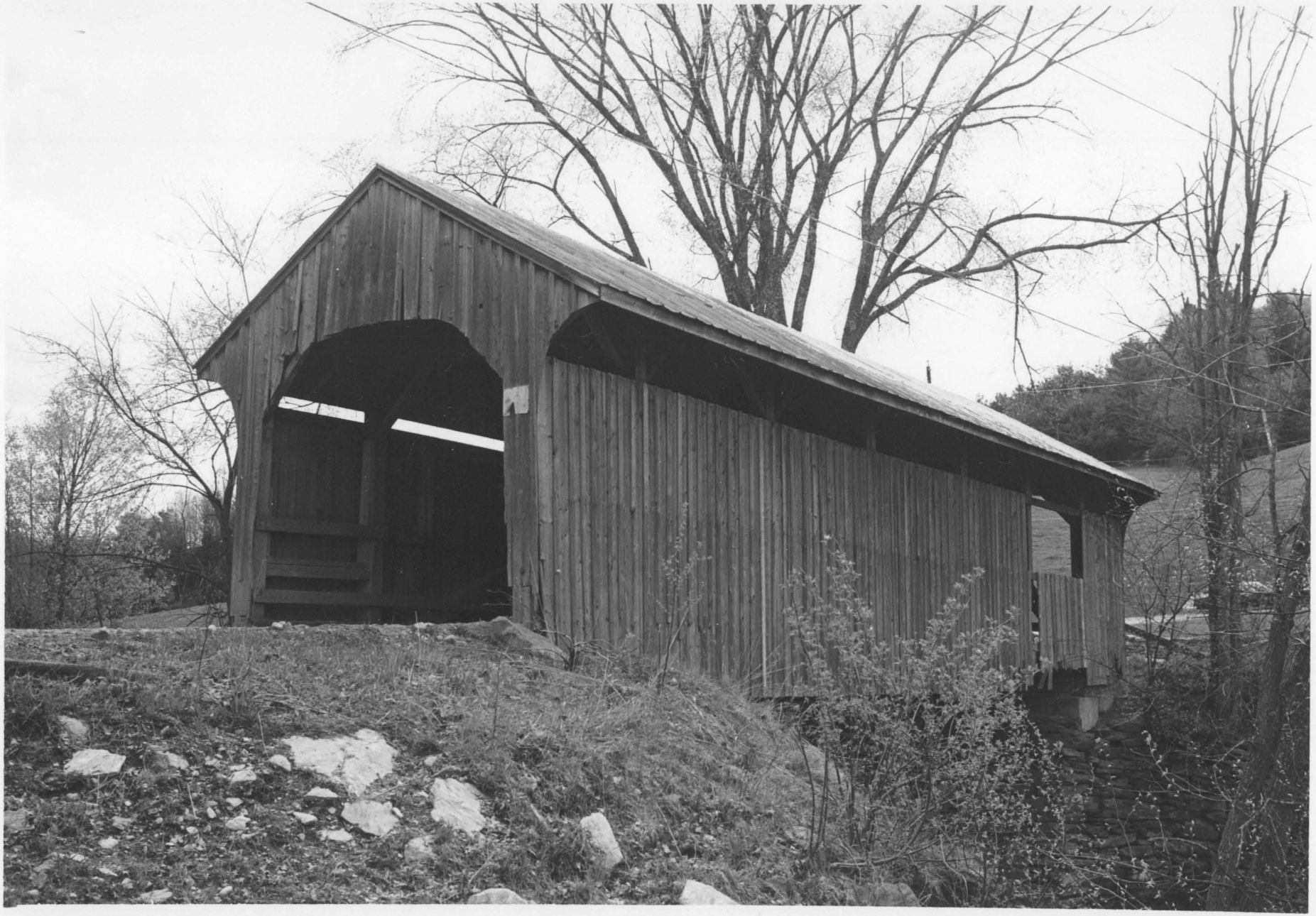
SUBJECT Hutchins covered bridge

DATE 5/1974 FILE # 74-A-30

CREDIT Hugh H. Henry

VIEW South elevation

3



VERMONT DIVISION OF HISTORIC SITES

COUNTY Lamoille TOWN Waterville

SUBJECT Village covered bridge

DATE 5/1974 FILE # 74-A-39

CREDIT Hugh H. Henry

VIEW North elevation and east portal

2

GUIDELINES FOR PRESERVATION PROJECTS ON COVERED BRIDGES

General Specifications:

It is the intent of this work to return the structure to a sound, stable condition, free of decayed or deteriorated materials, and as close to original condition as possible.

Care should be taken not to introduce materials or workmanship not in keeping with those employed in the original construction, or to remove or replace any more of the original materials than is required to achieve structural stability.

Insofar as possible, consistent with sound construction, the original fabric should be retained. New materials should match existing as closely as possible in quality and appearance.

Roofing (in order of preference):

1. Wood shingles
2. Standing seam metal (in preference to corrugated metal)
3. Roll asphalt roofing

Siding:

1. Wide-width boards or widths matching the oldest or any original siding remaining on the bridge.
2. Rough-sawn boards weather better and match original better than planed.
3. Naturally weathered old boards (such as old barn siding) are preferable to new siding when available.
4. New boards should be left bare rather than stained if the bridge is unpainted in order that they can age to the same color as old boards.

Structural Members:

1. Replacement of structural members should be avoided whenever a member can be spliced or repaired.
2. Any members replaced should match original in dimension as nearly as possible.
3. No wooden structural members on any part of a bridge may be replaced with steel or any material other than wood.
4. In cases where the use of steel support members appears unavoidable, State highway engineers and the Division for Historic Preservation must concur in advance.

Decking:

1. All decking materials should be of wood, unpaved, and should match the design original to the bridge in thickness, dimension of wood, method of attachment, distance between tracks and direction which boards are laid.

Abutments and Piers:

1. Stone abutments should be repaired with original stones or stone of the same type whenever possible. If replacement or reinforcing with concrete appears unavoidable, State highway engineers and the Division for Historic Preservation must concur in advance. Any cribbing to be replaced should be done with material of similar dimension, and same method of construction, as original or existing.

John - FYI
+ file

STATE OF VERMONT

AGENCY OF DEVELOPMENT AND COMMUNITY AFFAIRS

MONTPELIER, VERMONT 05602

OFFICE OF THE SECRETARY (802) 828-3211

MILTON A. EATON, SECRETARY

DEPARTMENTS OF:
Economic Development 828-3221
Housing & Community Affairs 828-3217

DIVISIONS OF:
Administration 828-3231
Historic Preservation 828-3226
Vermont Travel Division 828-3236
Vermont Life Magazine 828-3241

October 5, 1983

Mrs. Frederick H. Gilmore
4650 East 58th Street
Tulsa, Oklahoma 74135

Dear Mrs. Gilmore:

Governor Snelling asked that I reply to your letter, because the Division for Historic Preservation is the State agency that has been given the responsibility for identifying and protecting Vermont's historic resources.

I appreciate your concern for Vermont's covered bridges, as they are, along with our historic villages and cities, an important resource that should be preserved and cared for.

Over the last few years, the Division and other State agencies, particularly the Agency of Transportation, have taken an active interest in repairing and preserving our covered bridges. Currently, there are over 100 covered bridges in the state. A joint program between the Division and the Agency of Transportation was able to grant funds to towns to repair more than 60 bridges. There are very few bridges in the state that are suffering from serious deterioration. Traditionally, these bridges were not painted and were built as the most economical way to provide needed river crossings. Therefore, they do not and should not look shiney and new.

The Division is now looking forward to initiating an historic bridge fund to see that there are always funds available to take care of needed repairs and maintenance on our historic bridges.

I am enclosing a brochure on Vermont's covered bridges, a state highway map and a map that shows some of our other historic resources.

Sincerely,

DIVISION FOR HISTORIC PRESERVATION

Eric Gilbertson

Eric Gilbertson
Director

Enclosures

RICHARD A. SNELLING
GOVERNOR

STATE OF VERMONT
OFFICE OF THE GOVERNOR
PAVILION OFFICE BUILDING
MONTPELIER, VERMONT 05602
(802) 828-3333

MEMORANDUM

TO: Eric Gilbertson, Director, Historic Preservation Division

FROM: Nancy K. ~~Knox,~~ Special Assistant to the Governor

DATE: September 30, 1983

SUBJECT: Attached from Dorothy M. Gilmore

Would you kindly respond to Mrs. Gilmore on the Governor's behalf and provide her with the information she requests? Thank you.

NKK:dd

Attachment

/

4650 East 58th St.
Tulsa, Oklahoma
74135

September 21, 1983

The Honorable Richard Snelling → Eric G.
Governor of Vermont

Dear Sir:

Vermont is such a beautiful state!

Though we have been gone from New England for over thirty years, our favorite vacation is to return and just roam around Vermont.

My husband grew up in Manchester. My home was Lowell, Massachusetts, - but my first teaching assignment was in a one-room school, "The Coldbrook School" in Wilmington, Vermont. I fell in love with Vermont the two years that I taught there. (I also fell in love with the fine Vermonter who became my husband.)

Yes, Vermont is <u>beautiful</u>! It is <u>clean</u>. Its roads - even <u>back roads</u> - are well kept, and a joy to travel over.

Only one thing is <u>not</u> beautiful:

Vermont's covered bridges. This became so apparent to us, as we spent several weeks in the state in August. Covered bridges are so uniquely Vermont! Can't something be done - to restore each one, and keep each one painted and beautiful?? If only each bridge could sparkle as does the dome on the elegant Capitol Building!

I would like to think that there are people in your fine state who would like to accept the challenge of such a worthwhile project.

Good wishes to you, Sir as you serve the people of beautiful Vermont!

Sincerely yours,

Dorothy M. Gilmore

(Mrs. Frederick H.)

THE BUILDING
of
ZEHNDER'S
HOLZ-BRÜCKE

Milton S. Grāton

THE BUILDING OF ZEHNDER'S HOLZ-BRÜCKE

By

MILTON S. GRĀTON
Ashland, New Hampshire

Clifford-Nicol, Inc.
Plymouth, N.H.

I

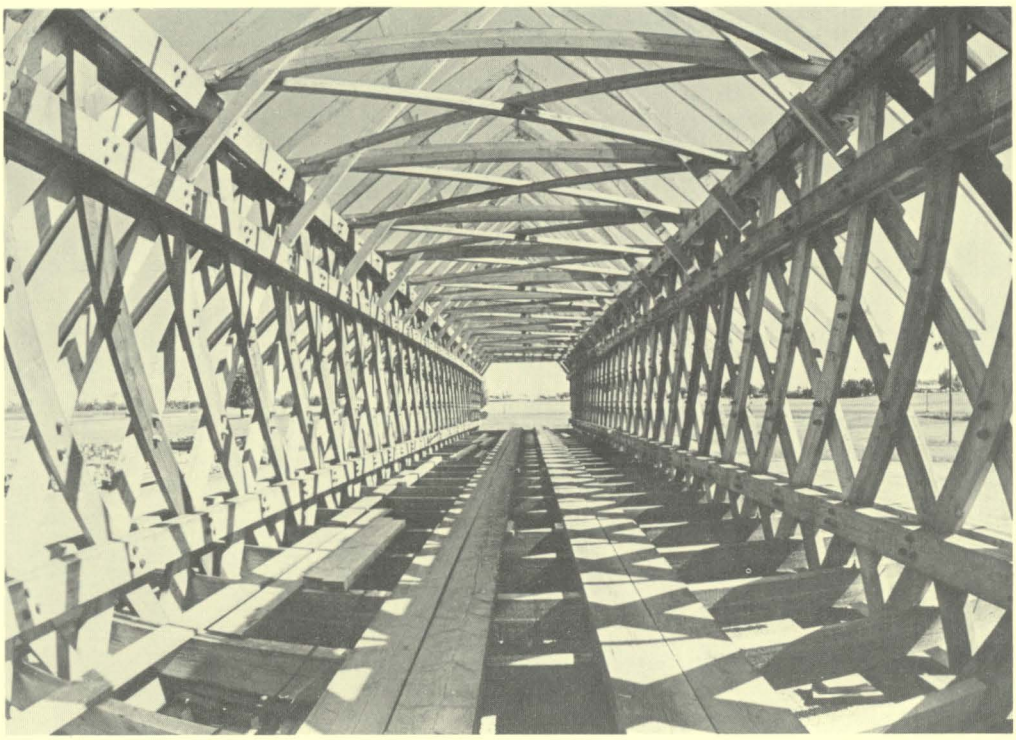
INTRODUCTION

In almost every era of civilization there are products created which are outstanding at that time. They are of such a usefulness as to linger on and become admired and priceless for the great effort that was involved in their creation.

Some of the products range from very old pottery and ancient domestic tools and handywork, to the pyramids of Eqypt. As we travel toward more modern times we find work so well done as to defy the elements almost completely. In the Roman Coliseum the destructive forces were man's own. This great creation was used as a quarry-source of building materials until the arrival of a period of appreciation and control.

Recent centuries have shown a more marked desire to respect and preserve many religious and public buildings even in the face of modern barbaric wars. Though wars have not been such a factor in American losses of the priceless, we have a built-in desire to consider our 100 years old buildings obsolete. Then we replace them with new tin, sheetrock, glass and cinder block buildings, which have no character and a sensible life expectancy of only 50 years.

Cover Photo:
M. S. Graton, Bill Zehnder and A. M. Graton. Bridge move completed.
Photo by Glenn Baker of Frankenmuth.



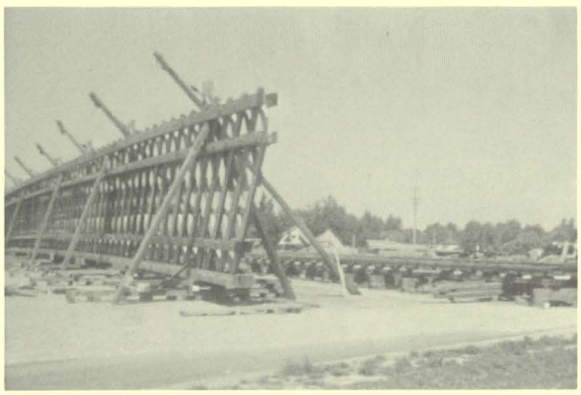
Zehnder's Holz-Brücke ready to be dressed. Photo by Glenn Baker of Frankenmuth, Michigan

DEFINITION OF AUTHENTIC HIGHWAY COVERED BRIDGE

The authentic highway covered bridge, as we see it, being America's only designers and erectors today, should meet the following requirements:

All materials for the structure should originate in the forest from replaceable sources, (replaceable in kind but not necessarily in quality). The kind of tree or timber will grow again with the setting out of new forests. That is all that man can do to replace in kind and it is a very commendable effort, but in our modern world the quality of this first cutting may never be achieved. These large timbers, some 6" x 16" x 32' long, which are select structural in grade with only very small knots, can only be produced from trees one to two hundred years old. No one will pay taxes on the second one hundred years of the tree life. During this period the semi-mature tree slows down its rapid growth while creating choice quality timber. This quality timber can be produced only in that portion of the tree's life cycle.

The framing positons should be created through conventional joining and not by the introduction of "labor saving" steel gadgets or fittings, which bypass the skilled framer. The "back bone" or frame of the bridge should be composed of a truss on either side. The covered bridge which is built on stringers has no real need for a cover because there is no framing to catch the moisture of rains which causes decay. I have heard of one young man of the "covered bridge variety" described this construction as "Mickey-Mouse", by which he meant pure pretense. If, in early days, a bridge were to be supported on stringers in long lengths, these stringers would be alternated as to tips and butts. They would not be hewed to the size permitted by the size of the tip end. Should a tree be found that would hew out a sixty foot timber of uniform size, this timber would, of course, not sustain its own weight to say nothing of the dead weight of the structure of which it was to be a part. With this reasoning in mind, we can see the justification for Caesar's reported pride in describing his bridging of the Rhine River with many short spans. We do not find clear or descriptive records of Ariovistus' means of crossing rivers, but being on the defensive, he might have been forced to use a primitive way which might not become the dignity of the Tenth Legion.



Though there are many recognized types of truss and variations of them, their respectability varies with the quantity of iron rods and other metal parts involved.

The roofing of the covered bridge comes in for much explaining as to reason. Some oft-written reasons are as follows:

1. To comfort an otherwise frightened horse with the thought that he was entering a barn.
2. To shelter travelers from the rain.
3. To allow one to hide with his neighbor's girlfriend or daughter.
4. To shelter a farmer's load of hay in a shower.

But the one overpowering reason for the bridge being covered is to prevent such damage as would come to your house if it had a leaking roof. The first four reasons mentioned, though no doubt welcome, must be considered to be by-products.

Why a covered bridge today when the country-side is literally "flooded" with steel and concrete structures? First of all, it cost no more, we are told, to create a 12 to 15 ton capacity covered bridge than a modern one of steel and concrete. The expected useful life of a covered bridge, with reasonable care, would be upward of 100 years. (The youngest covered bridge that we have restored is over 100 years old and the oldest is 146.) These, when restored, are good for another 100 years. The covered bridge brings back an appreciation of the mellowness of yesterday's skills as compared with the severity of today's mechanical monsters. In the climate where snow and slippery roads require the use of road salt, a modern concrete deck has a life expectancy of 25 to 30 years. Since we have witnessed the use of salt for slightly over forty years and the deck replacements only once, the cost of the second deck replacement can not be calculated from actual experience! The covered bridge, on the other hand, has no snow on the deck to require salting and the deck has no cause for concern even if salt were used. The maintenance of the covered bridge consists of blowing the deck and lower chords clean annually and keeping the roof tight. The use of an air compressor for a period of one half day each year with a restricted discharge on the compressed air line will thoroughly clean the average covered bridge. One might say that the concrete and steel bridge is not seen to be requiring any maintenance. If such cleaning, washing, sand blasting, and painting is not being done, it follows that "cancer" is surely developing and major repairs are inevitable.

THE FRANKENMUTH BRIDGE

In the summer of 1972 we received a letter from the Frankenmuth Bavarian Inn stating that they might be interested in purchasing a covered bridge and that they would like to talk with us if we could come from New Hampshire to Frankenmuth, Michigan for conference. Since we always have three or four years work scheduled or at least waiting, we await a second invitation before visiting, especially at 1,000 miles distance.

In September 1973, while visiting in Phoenix, Arizona, I wrote to Tiny Zehnder to determine if the Frankenmuth Bavarian Inn was still interested in talking. In returning to New Hampshire we could visit our daughter and family near Chicago or return via Frankenmuth, Michigan. We were advised that a visit would be appreciated and we responded a few days later. We arrived late on a Sunday afternoon. Yes, the usual lines were drawn up in battle formation. My wife suggested that we park our travel trailer and return to the inn. This we did and found

what appeared to be the same lines still formed. Finally, we were escorted by Tiny Zehnder behind the lines for our "reservation" and arrangements were made for a 10 a.m. meeting.

Eight o'clock next morning found us looking over the town of Frankenmuth. We were most favorably impressed. You might ask what relationship exists between the town and the building of a covered bridge. Since the building of a covered bridge or the restoration of one is not a commercial venture and you are going to be giving of your limited time to create something to be left in town, it would be satisfying to know that there would be appreciation. This appreciation would be best expressed in the care given the bridge. Since good housekeeping can safely be considered contagious on a municipal scale as well as on a domestic one, when we met Mr. Zehnder at 10 a.m., we had been convinced that what we had seen was not "window dressing".

Tiny Zehnder escorted us across the street to meet his brother, Eddie. Upon entering Zehnder's, we were introduced to Eddie's wife as covered bridge builders from New Hampshire. Mrs. Eddie Zehnder lost no time in asking, "Tiny, are you still thinking of that?" Tiny confessed that he was. Later we learned that the Zehnder Brothers had been dwelling on this scheme for 10 years and it was evident that they had worn a thin spot in that virtue known as patience. We spent the day at the Cass River location for the proposed covered bridge, obtaining soundings and elevations. The Zehnders asked that we return with a sketch indicating the size of a proposed covered bridge, the waterway and location, for a presentation to the United States Army Corps of Engineers.

To point out the difference between the planning for a covered bridge and a conventional bridge, I would like to cite an instance. When I reached New Hampshire I wrote to my old friend Colonel Wilbar Hoxie, a 35 year veteran of the Corps of Engineers at Waltham, Massachusetts. I told him of our visit to Frankenmuth and the approximate location of the proposed covered bridge. Before there was time for the Corps Headquarters at Detroit to mail me the information I had requested from them, Colonel Hoxie had obtained all available Corps information and had it in my hands! He offered further service if desired and stated that his special interest in this covered bridge stemmed from the fact that Governor Cass, Michigan's first governor, was one of his ancestors. The data, the Colonel sent to me, was complete records of borings, dikes and sump pumps.

We returned to Frankenmuth, Michigan early in the winter to meet the Corps of Engineers, State Highway Engineers, Town Officials and numerous other interested parties. Our presentation consisted of 150 selected slides of restorations of old covered bridges and the building of new ones. The meeting was very pleasant as a memory and there were none of the road blocks that are usually presented. The Corps, on the other hand, granting that if a covered bridge were to be built in Michigan, Frankenmuth would be the ideal place for one.

A month later we received a letter from the Corps, one suitable for display framing, stating in essence that their delegation felt more enlightened on leaving than upon arrival. Though we had provided for a waterway under our proposed covered bridge which was equal to that of a State bridge on Main Street, we would have to increase our waterway. The reason for this being that the state built a waterway for the 25 or 50 year storm while the Corps of Engineers builds for or to accommodate the 100 year storm.

Though we responded to other invitations to Frankenmuth meetings, the project remained on the back burner for several years. Finally, in the winter of 1978 we were told that the Zehnders might be ready to "Go" and to show up with something consistent with the present lumber market.

Our lumber supplier could find but one mill on the West Coast which would agree to saw a schedule of timber for a covered bridge at this time and they would require ninety days for production. Acceptance of their quotation was good for thirty days only. On this visit to Frankenmuth, Michigan, we discussed a few remaining matters and left with the assurance, "You will hear from us".

After three weeks, we received a telephone call from Tiny Zehnder as follows, "They tell me that our thirty-day lumber quotation is about to expire. Assume that we have an agreement and place the special order. Get something to us".

We immediately placed the order which consisted in part as follows:

Douglas Fir – Select Structural:

125 pieces of 4 x 12 - 24' long
125 pieces of 4 x 14 - 24' long
64 pieces of 4 x 12 - 32' long
64 pieces of 4 x 14 - 32' long
64 pieces of 6 x 16 - 32' long
64 pieces of 6 x 16 - 20' long
30 pieces of 10 x 12 - 34' long

There were required other woods.

Sawed locally:

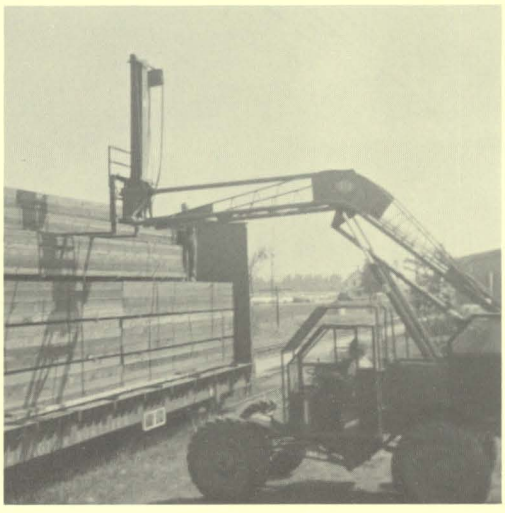
Cedar shingles - ½" thick, 3' long boards from 70 cords of logs in lengths of 9' 4".

Spruce plank - 320 pieces of 4 x 8 - 16' long.

The first order amounted to three rail car loads of lumber.

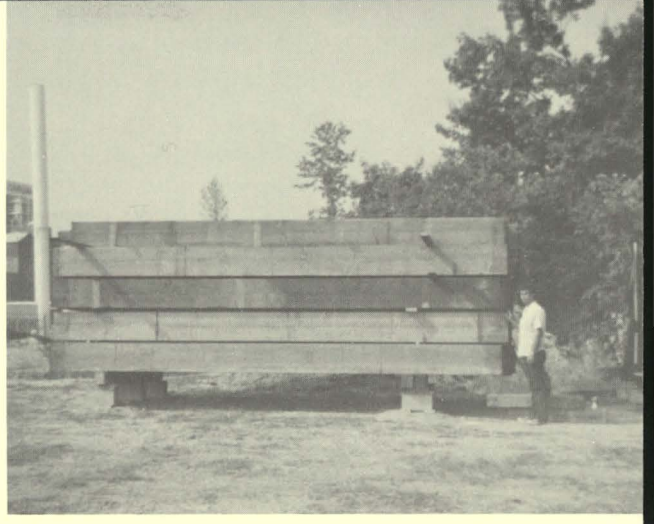
We sent what I considered to be the seeds for a "Zehnder-created" agreement. Three days later my document was returned. The Zehnders had signed it and sent this letter: "Please sign this and have it notarized and return it. We will have copies made for distribution." This was Zehnders' idea of an old-fashioned, iron-clad covered bridge building contract. There were no plans, no specifications, and no performance bond. Our simple agreement did mention the bearings, to be built by others, and their several measurements. It also noted that the bridge would, in our

The first rail car of timber arrives at Gera.
Photo by Doris Graton



Picking off small bites with timber lift.
Photo by Doris Graton

Taking timber off trailer with farm tractor and "sticking up".



Short 6" x 16" floor joists being "stuck up" and made ready for covering.

Photos by Doris Grāton

Long floor joists, 6" x 16" x 32' long, are being covered.

judgement, have a 15 ton capacity. We are told that the contract plans and specifications for the grading of the parking lot and providing of abutments, consumed upwards of fifty pages. One might wonder how much things have become streamlined in the past 100 years.

In July 1978 the first of the three rail cars carrying a total of 100,000 board feet of lumber arrived from Oregon. During the following month, the other two loads also reached Gera, about six miles from Frankenmuth. The timber was unloaded at the Gera railroad yard and trucked to the bridge location, where it was air dried. This lumber was carefully stuck up, the timber ends sprayed with several applications of Diesel fuel and battened down tightly with 6 millimeter polyethylene. This black covering would raise the temperature but not allow a too rapid loss of surface moisture from the timber; thus preventing season checking. A fourth car load was shipped directly to our Ashland, New Hampshire plant where it was to be framed into the upper bridge assemblies.

It was about this time that we started to discover what makes the City of Frankenmuth and the surrounding countryside CLICK! We needed white cedar shingles composed of ½" thick boards in three foot lengths. After searching the Upper Peninsula of Michigan, we finally found a swamp west of Alpena which had a substantial growth of white cedar. We arranged for this to be cut and delivered to the outskirts of Frankenmuth where Winnie Kern, a retired millwright, and Oscar Huber, a retired insurance broker, went to work on the necessary 130 squares of shingles. These two men and their helpers also sawed the 4 x 8 spruce plank for the deck.

Being 1,000 miles from our base of supply, we were often out of something, but some good neighbor would not fail to respond. All seemed anxious to be a part of what they considered their town's project.

During the early spring of 1979 we moved in several trailer loads of equipment, consisting of timber and prefitted upper bridge components.

Before laying out the work for building the bridge, we had determined the center line of the abutments and had projected that line up the grade and over into the leveled work area which was built on the parking lot. From this base line all of our layout work was carried on. The bedding timbers were arranged so that when a side truss was clampted together (400 complete clamps per side) and tipped up into an erect position, it stood accurately on the line to its final position.

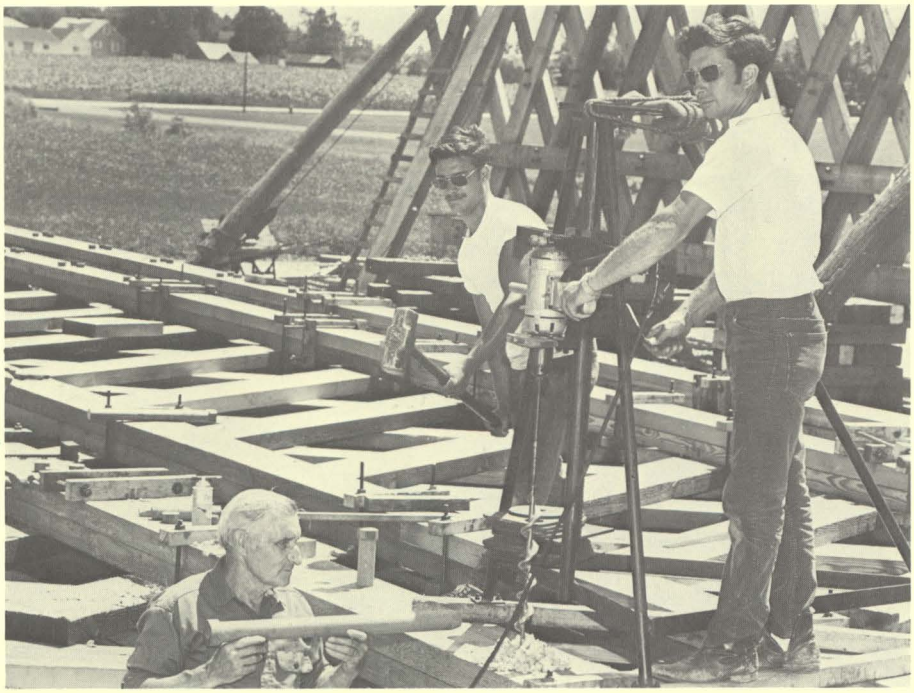
Arnold trimming first 4" x 14" x 32' bottom chord members. Other timber is temporary falsework.
Photo by Doris Grāton

About the middle of May, Arnold, my oldest son, with a helper, started to lay out the south side truss. This truss was 240' long and 20' high when stood up. It contained over thirty thousand board feet of lumber. By late June, we had erected the first truss. Our crew sometimes had a day or two when a visiting covered bridge "Buff" would lend a hand. This would suddenly swell our crew to five, but it was more often three or four workers. One young man, a true covered bridge "Buff", who was known to many visitors as "John, the pilot", has left his flying job in Vermont on several one-week periods to assist in the driving of trunnels and hand-raising of trusses.

TRUNNELS AND TIMBERS

The trunnels are 2" diameter white oak pins which are turned round except for a ¾" square portion at one end. This square top fits into a driving cap. These average to drive one inch with each blow of a 16 pound hammer. The trunnels in this bridge are 11", 24", and 27½" long for different locations in the chords and lattice. We had a total of 2,400 pieces of square stock, which were turned into trunnels.

In the Town Lattice type of truss, such as the Frankenmuth bridge, the trunnels and timbers must live in harmony to be successful. Since the intersecting areas of the timbers are pinned together in a fashion that causes the dimension of the unchanging timber to be made fast to the timber with a changing dimension, we planned ahead to insure that the timber with the changing dimension was stabilized. To do this the timbers had to be reduced to a moisture content of 14 to 15%, which is the reading that we would expect to find prevalent in the average covered bridge climate five years hence.



Milton Grāton, son Arnold, grandson Arnold Jr. placing trunnels. Photo by Glenn Baker

Timber behavior can be likened to that of man. Man can get fat if provided with a barrel of chocolates. He will not grow taller. We must get man worked down through exercise and feed him Quaker Oats, as we might a horse. In this way we can be sure of his behavior. In the other dimension, (height) man is not subject to sudden changes. Timber likewise has no measureable changes in length.

As the timber is stabilized, so also is the size of the hole that is drilled in the stabilized wood. The trunnels were created of timber that was also stabilized. To

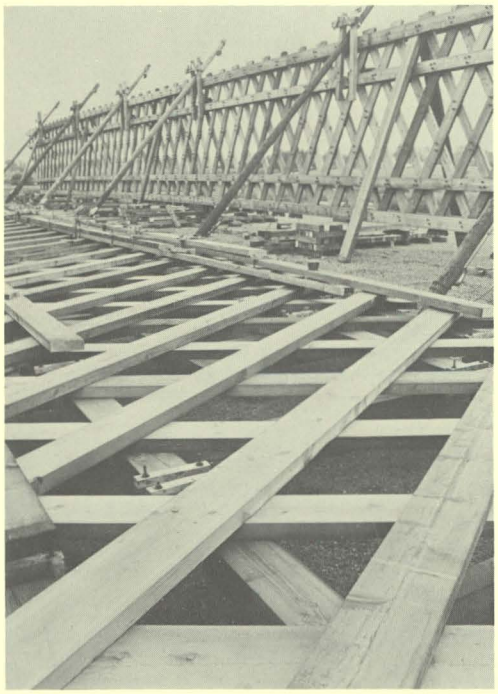
be of wood that is over dried would be to create internal stresses in the framing timber when moisture was reabsorbed. To have a moisture content above 14 to 15%, would mean a loose-fitting trunnel when stabilized; and perhaps sagging trusses.

In the building of the Zehnder's Holz-Brücke, we had only a year to prepare the trunnels. Our stock of stabilized timber would yield only one third of this dimension. White oak is very slow to give up its moisture. The accepted rule for air drying oak is one year for each inch of thickness, or in this case, two and one-third years. To force-dry oak for turning would mean many season checks in the wood and a trunnel head that would fall apart in driving. To overcome this we sawed the squares of trunnel stock 2½" and stuck them up with ½" x ½" stickers. We applied a coat of linseed oil to the ends each second day for five applications. When the outdoor drying season was finished, we restuck the material in our home basement. The material was arranged so that warm air was blown the entire thirty foot length, under the six foot high pile, which was twenty-eight inches in the third dimension. This pile was then covered tightly with polyethylene to contain nearly all the expelled moisture. The heating process was carried on for 12 weeks. We generally heated for 2 hours before our working day, 2 hours after work, and 2 hours in late evening. The heat-off hours permitted equalization of moisture in the oak squares. Some may say that all of this "Old Maid" treatment is unnecessary, but there is a great difference between a good piece of trunnel stock and a stick of fireplace wood.

As the side trusses were laid out and clamped in a curve (14" of cambre), more than 400 complete clamps were employed. Before drilling each cluster of three holes, a short piece of lattice stock was jacked tightly under the hole location to prevent the wood from flaking away when the drill broke through at the bottom

The second truss being raised by manpower. Photo by Glenn Baker

of a hole. More than one-half mile of holes were drilled in this bridge. In the driving of the trunnels a jack was placed under the timber nearby to prevent recoil of the chord, and to increase the net penetration. A penetration of 1" per blow from a 16 pound hammer is considered ideal, so in 24" of timber 18 blows would indicate too loose a fit, and on the other hand, 30 blows would be too tight. In this case of misfit, a slightly larger or smaller auger must be used.



The second truss laid out. Photo by Glenn Baker

When the first side truss had been completely pinned together, the erecting was done by man power. To assure that the truss did not blend in the raising process, it was necessary to shim the bottom chord at numerous points to compensate for the amount of cambre that had been produced at each point. This would maintain a straight line through the hinging points and prevent premature stresses. In erecting the side, seven jacking positions were prepared and jacks placed under the third chord. At these positions, the structure was jacked about six feet, as far as jacking would permit.

From this position to that of an erect truss, the raising was done with ginpoles. The ginpole was stood so as to lean slightly toward the truss, and a lifting yoke made secure around the ginpole. The wire rope that was to do the lifting was secured to the top of the ginpole, then passed through a snatch block at the lifting yoke and returned to another

Lining up floor stiffeners. Photo by Glenn Baker

Threading floor joists through second truss. Truss was moving

Photo by Glenn Baker

block at the top of the ginpole and finally back to the puller at the ginpole base. Each of the seven ginpoles was equipped in the same manner and the side was ready to raise. Four or five men can raise the side in this manner in one day. The second truss was built and raised by the same method as the first.

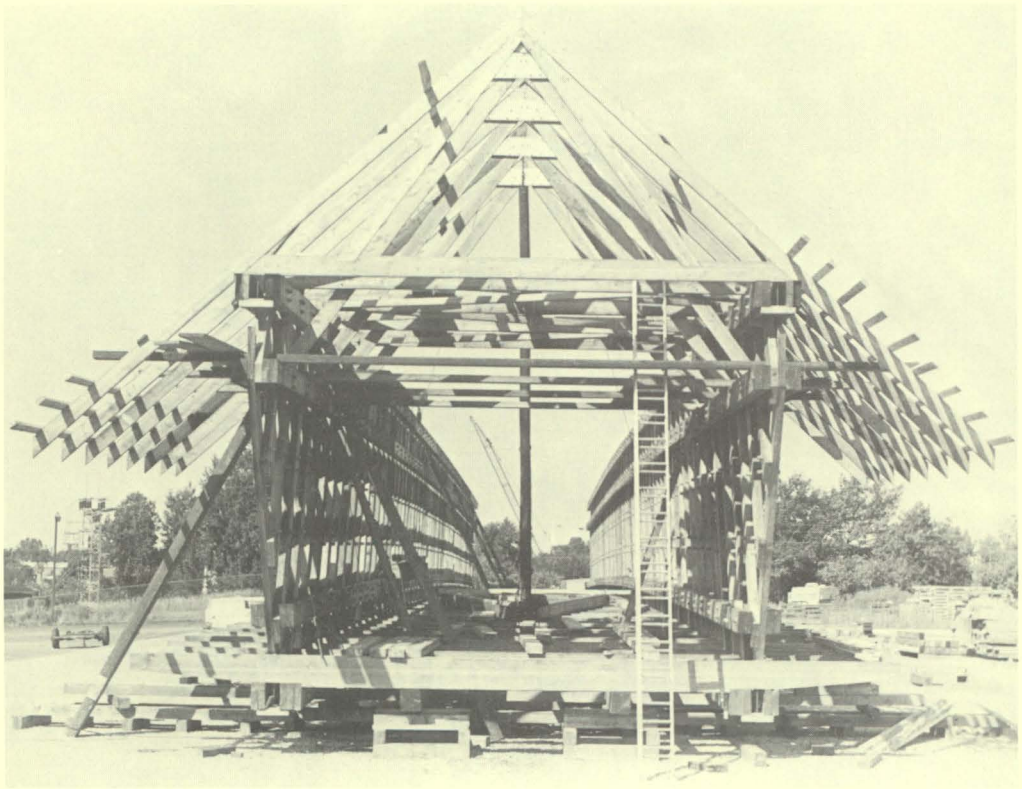
After the sides had been raised it was necessary, when a sidewalk is involved, to thread the floor joists through one truss above the bottom chord. The joists are alternated, short and long, so that every four feet there is a joist projecting far enough to support the walk and the long roof over-hang. The second truss was then rolled sidewise into its final position with the unsized portion of the joists firmly against the bottom chords. Every 8 feet a button is fastened up under the bottom chord by means of a 5/8" bolt which passes through a long joist. This helps to prevent swaying of the trusses.

ROOF

A complete roof truss was installed every 8 feet and secured by means of buttons as described above. The cross tie in these trusses had to be framed securely into the top chords to prevent any movement along the chords that might be caused by the lateral bracing. The secondary rafters, on their way from the ridge to the third chord, were also framed into the cross tie to work as knee bracing.

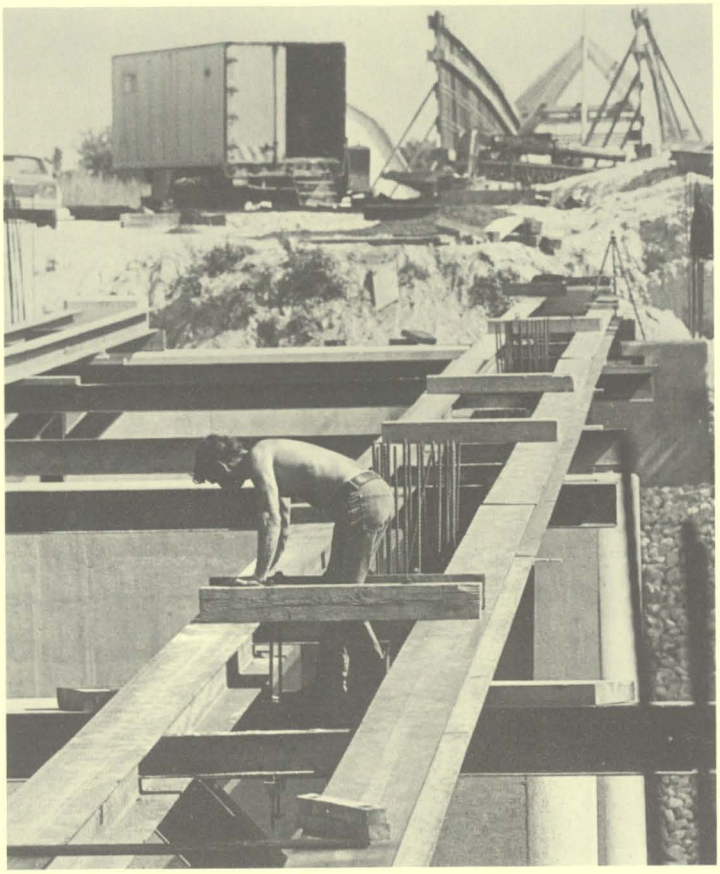
Raising roof truss by means of ginpole.
Photo by Glenn Baker

The thirty-one roof trusses had been fitted at our Ashland, New Hampshire shop, numbered and taken apart. When assembled in the bridge floor, these trusses were raised by a ginpole which was guyed to a V made of heavy timbers which were dragged forward each time a truss was placed. Upon reaching the end of the bridge floor, a 30' extension was built to accommodate the ginpole.



Placing roof trusses and rafters.

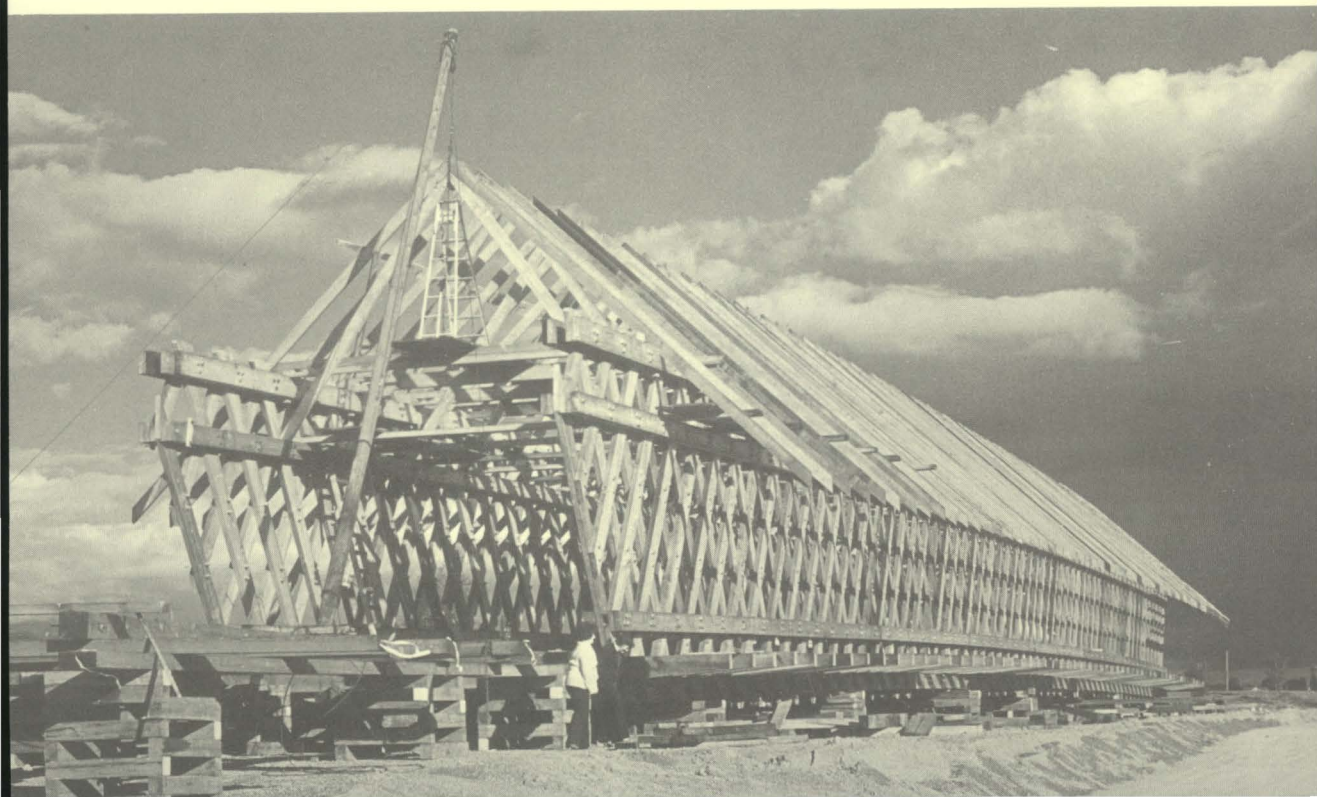
Photo by Frankenmuth News



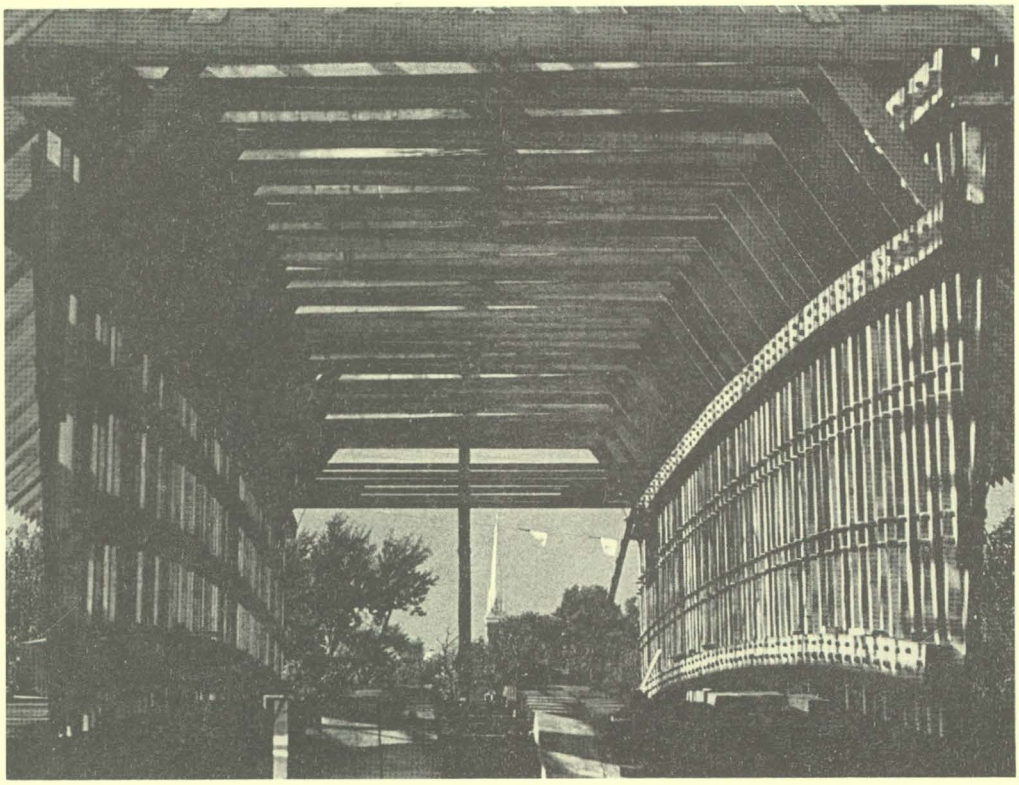
Arnold leveling a tempered steel falsework.
Photo by Glenn Baker

Placing last roof trusses from bridge floor extension.

Photo by Glenn Baker



The 3 foot shingles were nailed to 2 x 4 perlins. These perlins are 16" on center and the shingles are laid 16" to the weather. Having sat on one of the perlins on the roof for 8 weeks, Arnold finally nailed the last shingle onto the south side. The perlins and he had become moulded to produce the fit and comfort of an easy chair.



Showing cambre in trusses. Photo by Glenn Baker

DORMERS

The covered bridge is one structure which can be modified in many ways, to match or be in harmony with its surroundings or to be physically sufficient in an abusive setting. In the case of the Zehnder's Holz-Brücke, it was desirable for the bridge to be strong for bus traffic and yet have the all-around feeling of mellowness and quaint touch of antiquity. It should be friendly to the Bavarian but not

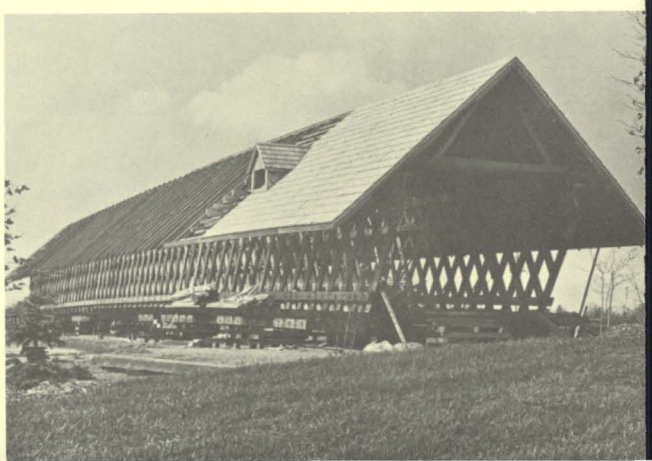
radical enough to offend its Yankee counterparts. When Tiny Zehnder casually dropped a word about dormers, I volunteered that I had yet to see a covered bridge with dormers. He may have anticipated a difference of opinion for in the next breath he said, "This is Frankenmuth". These dormers do add. They allow one to focus his attention on the bridge rather than on the immense roof. We built the six dormers in our shop and brought them as units to mount on the roof. They were set by the use of a ginpole and will be lighted.

Arnold preparing to lift dormer.

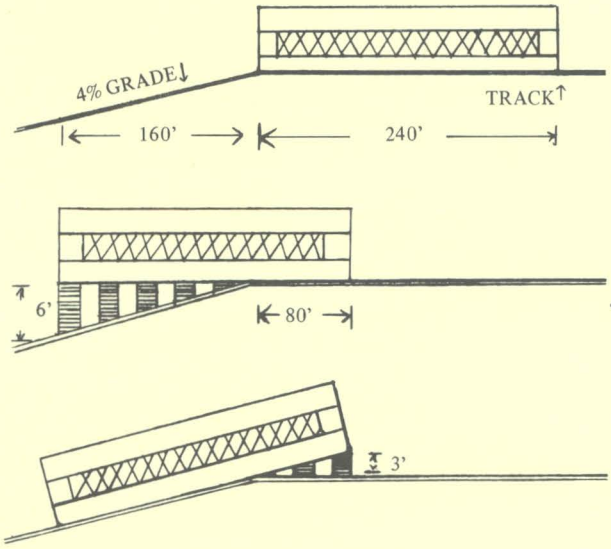
Photos by Glenn Baker

Arnold placing perlins and examining shingles.

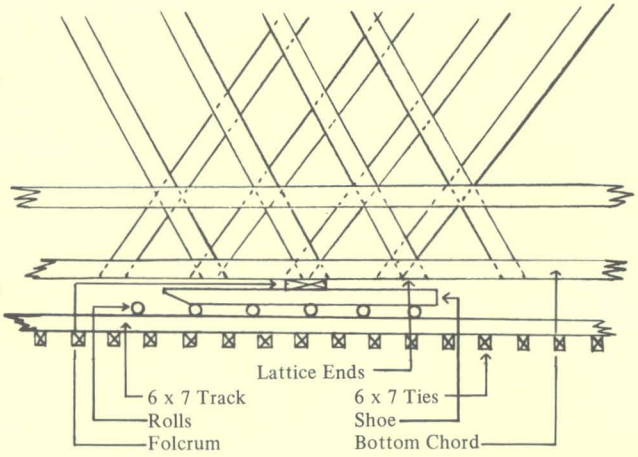
East end shingled.



DOWN GRADE 20' TO THE FINAL LOCATION



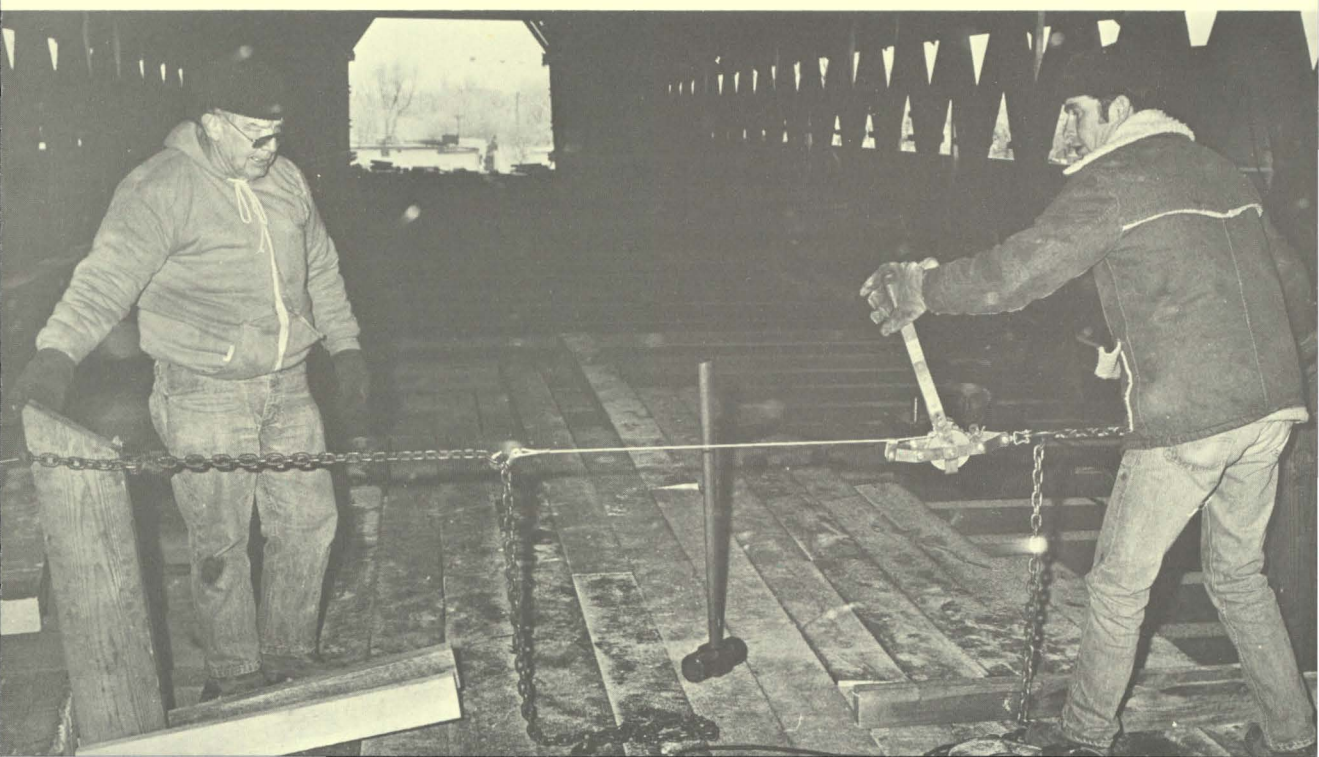
Descent of Bridge.

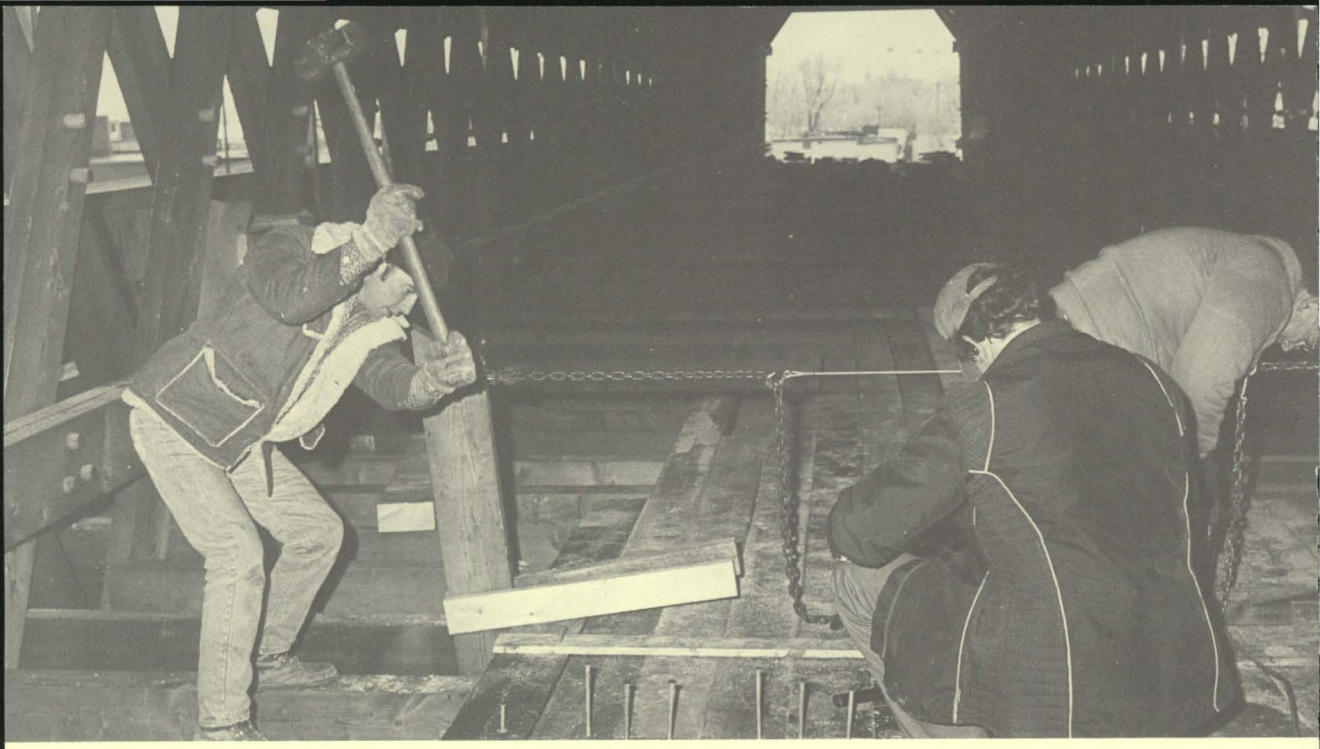


A typical roll assembly for the moving of the bridge toward the river. The height or thickness of the folcrum varies to compensate for cambre in truss.

After the center 9 feet of the bridge floor was placed, the structure was ready to move. It was to be rolled about 500 feet in making a vertical descent of 20 feet. The west end of the bridge was at a point where the 4% grade met our level assembly area. We placed the bridge on 240' of level track with rolls at twenty locations.

Arthur Potter and Arnold compressing floor plank. Photo by Glenn Baker





Arthur Potter drilling pilot holes in floor plank. Jeff Baker placing spikes. Arnold driving spikes. Photo by Glenn Baker

One could coin a new term, "Bavarian Cooperation", after an experience in a strange town where contractors, church builders, insurance men, maintenance professionals, horse teamsters, ox teamsters, carpenters, commercial pilots, covered bridge buffs, printers, retired bookkeepers, and farmers came to offer their help in the bridge moving. There was need to increase our personnel from a total of 3 or 4 to 15. These good people helped us during the moving and in some cases for weeks

Capstan before oxen started moving forward. Photo by Glenn Baker

before, with no thought of financial reward. They seemed to want to be a part of what they considered a "once-in-a-lifetime" town project.

At this time we had to excavate some 500 cubic yards of earth and place a 6" layer of crushed limestone to bring the grade to match the steel falsework at the west side of the river. It extended east with a 4% rise in grade to the break that was originally at the west end of the bridge. All that was left to do was to build our little double track railroad. We placed our 6" x 7" - 4' ties, 12" apart, in straight lines, and covered with a track of 4 or 5 lines of 6" x 7" timbers in 8 foot lengths.

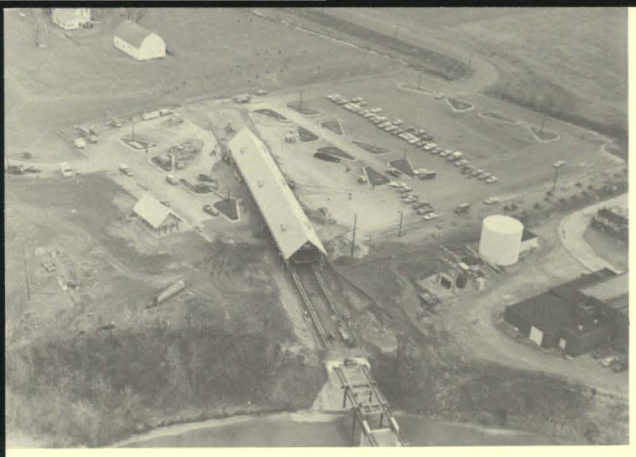
The track was laid 200 feet down the grade. We then built an extension of the level track for a distance of 160 feet toward the river. This section of blocking between the now level track and the down grade track was 0' at the bridge end and 6' at the lower end. The bridge was then rolled forward 160'.

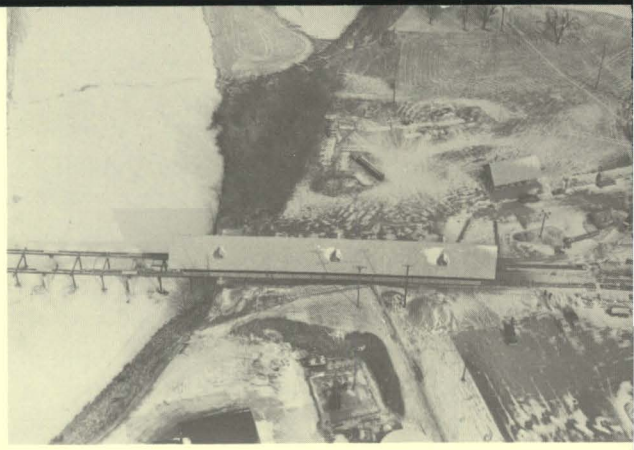
IN THIS FORWARD MOVE

We used the power of the oxen at the east end. With the price of Arabian oil going up each day, we decided it was more sensible, and economical to go "back to the farm". Surely Tiny Zehnder's herd of 250 head of prize cattle would not mind sharing a few bouquets of alfalfa with these cute little strangers!

When the oxen moved in, the board and room as agreed by Zehnders' was okay. Now, Mr. Hayhoe explained that his "boys" had been pampered and he could find no warm shower in the barn. He was right; there was none. Mr. Hayhoe was proud of his well-groomed oxen and promptly made arrangements for a march through the local car wash. Here each morning they were prepared for their public appearance by having a warm soap and water shower down from the "wading" line. The oxen were not disappointed in their accommodations!

Oxen off to their morning shower. Photo by Glenn Baker





Aerial views of progress down the 4% grade.
Photos by Glenn Baker

The capstan was set up at the east end of the bridge. With the anchor at the east bridge abutment and the opposing force secured in the east end of the bridge floor, the oxen would give the appearance of pushing the bridge toward the river. After taking up the "slack" in the system, a forward movement of 3½" per revolution of the capstan could be assured.

As the bridge moved forward we had to straighten unruly rolls and move the loose ones around forward to enter again at each of the 20 stations.

One rainy day it was estimated that there were over 200 people under the bridge. None of them seemed to be afraid of the operation. It takes a bit of diplomacy to be able to tell all those folks how welcome they are and still try to work

in the very little remaining space. There rests the difference between the wooden covered bridge and the concrete monsters.

The point for our giant "teeter board" was established at the break in the grade and we proceeded to lower the west end of the bridge 6 feet while raising the east end 3 feet. During this operation we maintained the previously established tangent along the 240 feet of the bottom bridge roller shoes.

Having accomplished the changing of roller bearings from level to 4% grade, the next procedure was to build in blocking to hold the track from the grade-break east for 80 feet. This blocking was also to hold track from 0 to +3 feet from level. The rolling positions were all fitted with shims to a **precise** plane and then the jacks were removed.

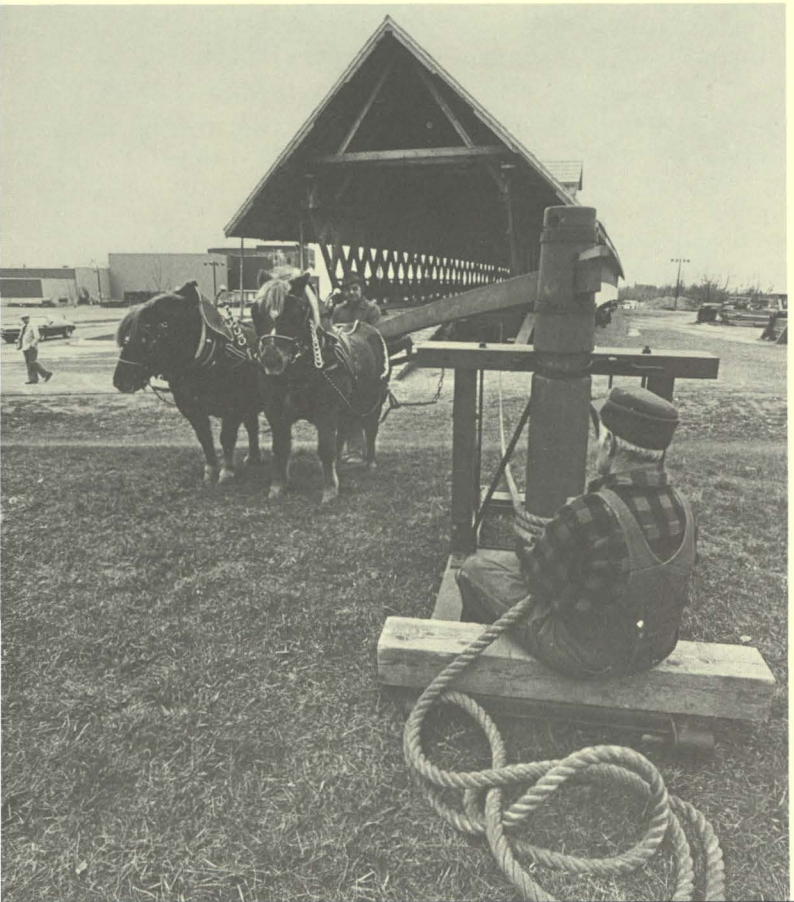
At this time we had moved the capstan to the west side of the river, in the parking area. Though the bridge was nearly 400 feet from its final position the capstan would be only 30 feet from the west portal when the pull was complete. Oxen belonging to Mr. Alfred Hayhoe and Mr. Lloyd Maynard alternated in pulling as did two two-horse teams belonging to Mr. H. Reed and Mr. Sargent. Each time a team pulled the pole of the capstan around the circle, the bridge advanced 3½ inches.

To prevent the estimated 230 tons of now dry-land bridge from rolling out of control, we placed two snub-lines of 1¼" steel cable. These lines were secured to the understructure and extended for 150 feet to the rear, where they were attached to an eighteen ton bulldozer. When the "balance of power" between bulldozer and oxen became a smooth operation, a ten-wheel dump truck with a 12 cubic yard load of stone was substituted for the bulldozer by Mr. Lentner and his very accommodating "little" sons. They had use for the bulldozer elsewhere.

The resistance to forward movement in the bridge was maintained evenly by the heavy snub lines being held tightly enough to keep them a certain distance above the ground. This made a ready signal for more, or less, line restraint.

The oxen had a mechanical advantage of about 10 to 1 (disregarding friction) at the capstan. This was multiplied by 9 through a pair of quadruple blocks in the rope within the bridge, on the floor. When the rope crossing the river would become very straight, it was necessary at times to signal for a slight relaxing of steel cable at the other end of the bridge.

At first the progress was quite rapid. It was easy to work on the graded surface. We moved nearly 70' the



Henry Reed and his horses make the first pull forward.
Photo by Mr. Herzog

Arnold Graton, Milton Grāton, Tiny Zehnder, Bill Zehnder and John, the Pilot, entertain the Hayhoe oxen.
Photo by Glenn Baker

second day on this grade but soon reached the edge of the falsework where all placing ties, track and rolls had to be done from cat-walks. These walks also had to be built as we progressed. Material had to be carried along the cat-walks or handed down through the holes which were left open in the bridge floor. Much of the time the carrying distance reached 200'. About ten days were required to place the tracks for the first level move, and to move the 160'.

The plan had been made in early November to start down the grade on January 18th and to arrive in place spanning the river at 12 o'clock noon on January 29, 1980. I kept the tension on the 1½" rope during the entire pull. My accomplishment was producing an average of 75 pounds of tension on the line for a total of nearly a mile.

The oxen and horses were asked many times to yield their place to special interest groups ranging from a complete fifth grade class who walked all over me to the sedate Michigan Historical Commissioners who proved to be as careful as the oxen. Though a substantial net retaining force had to be maintained for safety, for short periods, it could be reduced to perhaps 4 or 5 tons. I had waited several days and anxiously for the arrival of members of Women's Lib who were reported to have threatened to take over my job, but no relief came.

On the final day of pulling, we were to arrive at noon! We placed oak blocks against the concrete abutment to maintain a 1" clearance, and then pulled until the bridge touched against these spacing blocks. It was a cold day and no one had a watch. The ribbon on the entrance to the north side was cut and 400 people swarmed onto that sidewalk. They proceeded across the end to the south walk and were half way back across the bridge when the noon whistle blew at The Star of West Flour Mill. We were at least 4 minutes early!

As Tiny Zehnder stepped off the bridge sidewalk he appeared happy and relieved. He said as he held out his hand to shake my rope-blistered one, "I am glad to see that the bridge reaches across the Cass River! Now, lets' have a Bavarian Chicken Dinner".

Tiny Zehnder and Milton Grāton.
Photo by Glenn Baker

THE BUILDING OF ZEHNDER'S HOLZ-BRÜCKE

By

MILTON S. GRĀTON
Ashland, New Hampshire

Clifford-Nicol, Inc.
Plymouth, N.H.

I

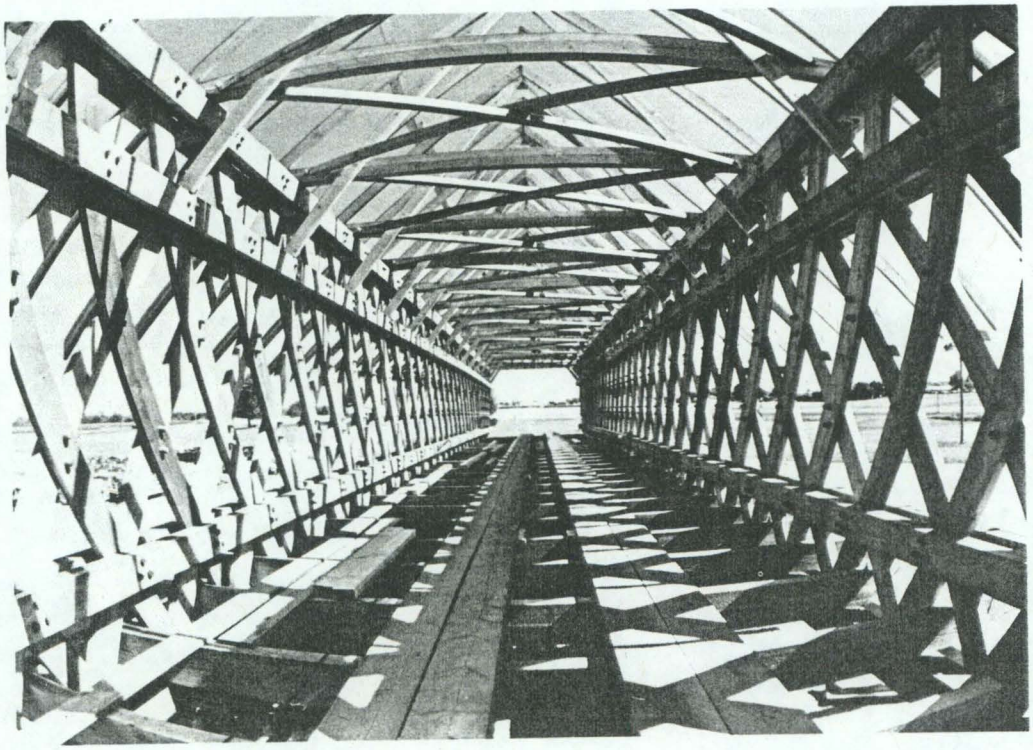
INTRODUCTION

In almost every era of civilization there are products created which are outstanding at that time. They are of such a usefulness as to linger on and become admired and priceless for the great effort that was involved in their creation.

Some of the products range from very old pottery and ancient domestic tools and handywork, to the pyramids of Eqypt. As we travel toward more modern times we find work so well done as to defy the elements almost completely. In the Roman Coliseum the destructive forces were man's own. This great creation was used as a quarry-source of building materials until the arrival of a period of appreciation and control.

Recent centuries have shown a more marked desire to respect and preserve many religious and public buildings even in the face of modern barbaric wars. Though wars have not been such a factor in American losses of the priceless, we have a built-in desire to consider our 100 years old buildings obsolete. Then we replace them with new tin, sheetrock, glass and cinder block buildings, which have no character and a sensible life expectancy of only 50 years.

Cover Photo:
M. S. Graton, Bill Zehnder and A. M. Graton. Bridge move completed.
Photo by Glenn Baker of Frankenmuth.



Zehnder's Holz-Brücke ready to be dressed.

Photo by Glenn Baker of Frankenmuth, Michigan

DEFINITION OF AUTHENTIC HIGHWAY COVERED BRIDGE

The authentic highway covered bridge, as we see it, being America's only designers and erectors today, should meet the following requirements:

All materials for the structure should originate in the forest from replaceable sources, (replaceable in kind but not necessarily in quality). The kind of tree or timber will grow again with the setting out of new forests. That is all that man can do to replace in kind and it is a very commendable effort, but in our modern world the quality of this first cutting may never be achieved. These large timbers, some 6" x 16" x 32' long, which are select structural in grade with only very small knots, can only be produced from trees one to two hundred years old. No one will pay taxes on the second one hundred years of the tree life. During this period the semi-mature tree slows down its rapid growth while creating choice quality timber. This quality timber can be produced only in that portion of the tree's life cycle.

The framing positons should be created through conventional joining and not by the introduction of "labor saving" steel gadgets or fittings, which bypass the skilled framer. The "back bone" or frame of the bridge should be composed of a truss on either side. The covered bridge which is built on stringers has no real need for a cover because there is no framing to catch the moisture of rains which causes decay. I have heard of one young man of the "covered bridge variety" described this construction as "Mickey-Mouse", by which he meant pure pretense. If, in early days, a bridge were to be supported on stringers in long lengths, these stringers would be alternated as to tips and butts. They would not be hewed to the size permitted by the size of the tip end. Should a tree be found that would hew out a sixty foot timber of uniform size, this timber would, of course, not sustain its own weight to say nothing of the dead weight of the structure of which it was to be a part. With this reasoning in mind, we can see the justification for Caesar's reported pride in describing his bridging of the Rhine River with many short spans. We do not find clear or descriptive records of Ariovistus' means of crossing rivers, but being on the defensive, he might have been forced to use a primitive way which might not become the dignity of the Tenth Legion.

Though there are many recognized types of truss and variations of them, their respectability varies with the quantity of iron rods and other metal parts involved.

The roofing of the covered bridge comes in for much explaining as to reason. Some oft-written reasons are as follows:

1. To comfort an otherwise frightened horse with the thought that he was entering a barn.
2. To shelter travelers from the rain.
3. To allow one to hide with his neighbor's girlfriend or daughter.
4. To shelter a farmer's load of hay in a shower.

But the one overpowering reason for the bridge being covered is to prevent such damage as would come to your house if it had a leaking roof. The first four reasons mentioned, though no doubt welcome, must be considered to be by-products.

Why a covered bridge today when the country-side is literally "flooded" with steel and concrete structures? First of all, it cost no more, we are told, to create a 12 to 15 ton capacity covered bridge than a modern one of steel and concrete. The expected useful life of a covered bridge, with reasonable care, would be upward of 100 years. (The youngest covered bridge that we have restored is over 100 years old and the oldest is 146.) These, when restored, are good for another 100 years. The covered bridge brings back an appreciation of the mellowness of yesterday's skills as compared with the severity of today's mechanical monsters. In the climate where snow and slippery roads require the use of road salt, a modern concrete deck has a life expectancy of 25 to 30 years. Since we have witnessed the use of salt for slightly over forty years and the deck replacements only once, the cost of the second deck replacement can not be calculated from actual experience! The covered bridge, on the other hand, has no snow on the deck to require salting and the deck has no cause for concern even if salt were used. The maintenance of the covered bridge consists of blowing the deck and lower chords clean annually and keeping the roof tight. The use of an air compressor for a period of one half day each year with a restricted discharge on the compressed air line will thoroughly clean the average covered bridge. One might say that the concrete and steel bridge is not seen to be requiring any maintenance. If such cleaning, washing, sand blasting, and painting is not being done, it follows that "cancer" is surely developing and major repairs are inevitable.

THE FRANKENMUTH BRIDGE

In the summer of 1972 we received a letter from the Frankenmuth Bavarian Inn stating that they might be interested in purchasing a covered bridge and that they would like to talk with us if we could come from New Hampshire to Frankenmuth, Michigan for conference. Since we always have three or four years work scheduled or at least waiting, we await a second invitation before visiting, especially at 1,000 miles distance.

In September 1973, while visiting in Phoenix, Arizona, I wrote to Tiny Zehnder to determine if the Frankenmuth Bavarian Inn was still interested in talking. In returning to New Hampshire we could visit our daughter and family near Chicago or return via Frankenmuth, Michigan. We were advised that a visit would be appreciated and we responded a few days later. We arrived late on a Sunday afternoon. Yes, the usual lines were drawn up in battle formation. My wife suggested that we park our travel trailer and return to the inn. This we did and found

what appeared to be the same lines still formed. Finally, we were escorted by Tiny Zehnder behind the lines for our "reservation" and arrangements were made for a 10 a.m. meeting.

Eight o'clock next morning found us looking over the town of Frankenmuth. We were most favorably impressed. You might ask what relationship exists between the town and the building of a covered bridge. Since the building of a covered bridge or the restoration of one is not a commercial venture and you are going to be giving of your limited time to create something to be left in town, it would be satisfying to know that there would be appreciation. This appreciation would be best expressed in the care given the bridge. Since good housekeeping can safely be considered contagious on a municipal scale as well as on a domestic one, when we met Mr. Zehnder at 10 a.m., we had been convinced that what we had seen was not "window dressing".

Tiny Zehnder escorted us across the street to meet his brother, Eddie. Upon entering Zehnder's, we were introduced to Eddie's wife as covered bridge builders from New Hampshire. Mrs. Eddie Zehnder lost no time in asking, "Tiny, are you still thinking of that?" Tiny confessed that he was. Later we learned that the Zehnder Brothers had been dwelling on this scheme for 10 years and it was evident that they had worn a thin spot in that virtue known as patience. We spent the day at the Cass River location for the proposed covered bridge, obtaining soundings and elevations. The Zehnders asked that we return with a sketch indicating the size of a proposed covered bridge, the waterway and location, for a presentation to the United States Army Corps of Engineers.

To point out the difference between the planning for a covered bridge and a conventional bridge, I would like to cite an instance. When I reached New Hampshire I wrote to my old friend Colonel Wilbar Hoxie, a 35 year veteran of the Corps of Engineers at Waltham, Massachusetts. I told him of our visit to Frankenmuth and the approximate location of the proposed covered bridge. Before there was time for the Corps Headquarters at Detroit to mail me the information I had requested from them, Colonel Hoxie had obtained all available Corps information and had it in my hands! He offered further service if desired and stated that his special interest in this covered bridge stemmed from the fact that Governor Cass, Michigan's first governor, was one of his ancestors. The data, the Colonel sent to me, was complete records of borings, dikes and sump pumps.

We returned to Frankenmuth, Michigan early in the winter to meet the Corps of Engineers, State Highway Engineers, Town Officials and numerous other interested parties. Our presentation consisted of 150 selected slides of restorations of old covered bridges and the building of new ones. The meeting was very pleasant as a memory and there were none of the road blocks that are usually presented. The Corps, on the other hand, granting that if a covered bridge were to be built in Michigan, Frankenmuth would be the ideal place for one.

A month later we received a letter from the Corps, one suitable for display framing, stating in essence that their delegation felt more enlightened on leaving than upon arrival. Though we had provided for a waterway under our proposed covered bridge which was equal to that of a State bridge on Main Street, we would have to increase our waterway. The reason for this being that the state built a waterway for the 25 or 50 year storm while the Corps of Engineers builds for or to accommodate the 100 year storm.

Taking timb

Though we responded to other invitations to Frankenmuth meetings, the project remained on the back burner for several years. Finally, in the winter of 1978 we were told that the Zehnders might be ready to "Go" and to show up with something consistent with the present lumber market.

Our lumber supplier could find but one mill on the West Coast which would agree to saw a schedule of timber for a covered bridge at this time and they would require ninety days for production. Acceptance of their quotation was good for thirty days only. On this visit to Frankenmuth, Michigan, we discussed a few remaining matters and left with the assurance, "You will hear from us".

After three weeks, we received a telephone call from Tiny Zehnder as follows, "They tell me that our thirty-day lumber quotation is about to expire. Assume that we have an agreement and place the special order. Get something to us".

We immediately placed the order which consisted in part as follows:

Douglas Fir – Select Structural:

125 pieces of 4 x 12 - 24' long
125 pieces of 4 x 14 - 24' long
64 pieces of 4 x 12 - 32' long
64 pieces of 4 x 14 - 32' long
64 pieces of 6 x 16 - 32' long
64 pieces of 6 x 16 - 20' long
30 pieces of 10 x 12 - 34' long

There were required other woods.

Sawed locally:

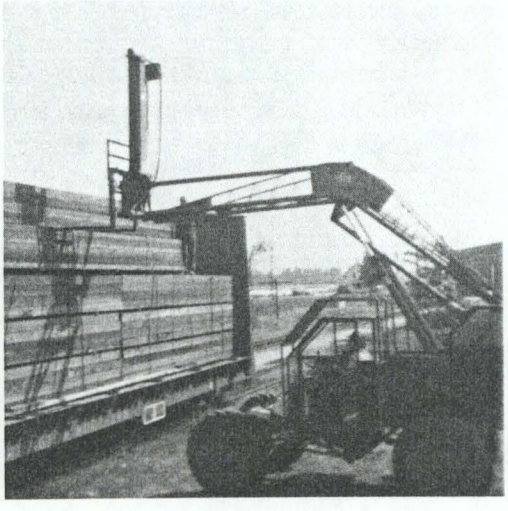
Cedar shingles - ½" thick, 3' long boards from 70 cords of logs in lengths of 9' 4".

Spruce plank - 320 pieces of 4 x 8 - 16' long.

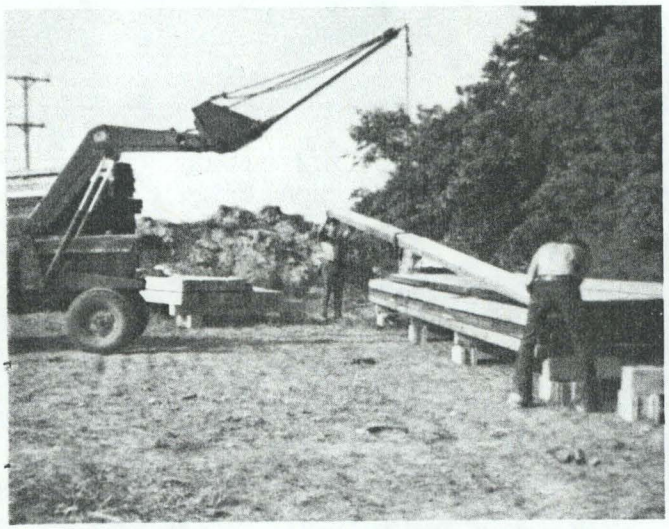
The first order amounted to three rail car loads of lumber.

We sent what I considered to be the seeds for a "Zehnder-created" agreement. Three days later my document was returned. The Zehnders had signed it and sent this letter: "Please sign this and have it notarized and return it. We will have copies made for distribution." This was Zehnders' idea of an old-fashioned, iron-clad covered bridge building contract. There were no plans, no specifications, and no performance bond. Our simple agreement did mention the bearings, to be built by others, and their several measurements. It also noted that the bridge would, in our

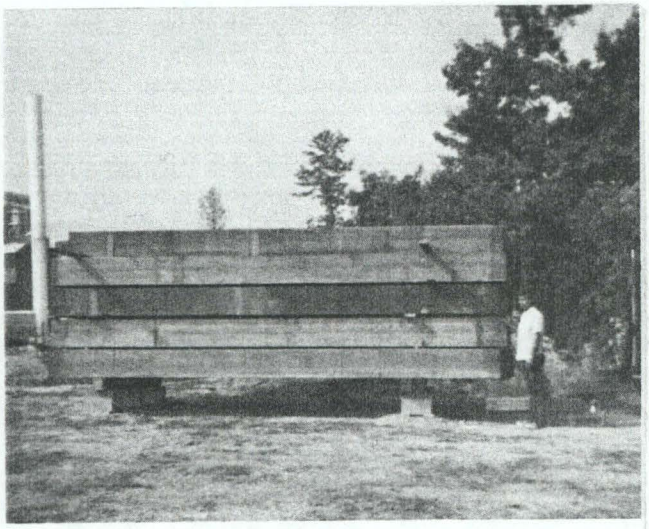
The first rail car of timber arrives at Gera.
Photo by Doris Graton



Picking off small bites with timber lift.
Photo by Doris Graton



Taking timber off trailer with farm tractor and "sticking up".



Short 6" x 16" floor joists being "stuck up" and made ready for covering.

Photos by Doris Grāton

Long floor joists, 6" x 16" x 32' long, are being covered.

judgement, have a 15 ton capacity. We are told that the contract plans and specifications for the grading of the parking lot and providing of abutments, consumed upwards of fifty pages. One might wonder how much things have become streamlined in the past 100 years.

In July 1978 the first of the three rail cars carrying a total of 100,000 board feet of lumber arrived from Oregon. During the following month, the other two loads also reached Gera, about six miles from Frankenmuth. The timber was unloaded at the Gera railroad yard and trucked to the bridge location, where it was air dried. This lumber was carefully stuck up, the timber ends sprayed with several applications of Diesel fuel and battened down tightly with 6 millimeter polyethylene. This black covering would raise the temperature but not allow a too rapid loss of surface moisture from the timber; thus preventing season checking. A fourth car load was shipped directly to our Ashland, New Hampshire plant where it was to be framed into the upper bridge assemblies.

It was about this time that we started to discover what makes the City of Frankenmuth and the surrounding countryside CLICK! We needed white cedar shingles composed of ½" thick boards in three foot lengths. After searching the Upper Peninsula of Michigan, we finally found a swamp west of Alpena which had a substantial growth of white cedar. We arranged for this to be cut and delivered to the outskirts of Frankenmuth where Winnie Kern, a retired millwright, and Oscar Huber, a retired insurance broker, went to work on the necessary 130 squares of shingles. These two men and their helpers also sawed the 4 x 8 spruce plank for the deck.

Being 1,000 miles from our base of supply, we were often out of something, but some good neighbor would not fail to respond. All seemed anxious to be a part of what they considered their town's project.

During the early spring of 1979 we moved in several trailer loads of equipment, consisting of timber and prefitted upper bridge components.

Before laying out the work for building the bridge, we had determined the center line of the abutments and had projected that line up the grade and over into the leveled work area which was built on the parking lot. From this base line all of our layout work was carried on. The bedding timbers were arranged so that when a side truss was clampted together (400 complete clamps per side) and tipped up into an erect position, it stood accurately on the line to its final position.

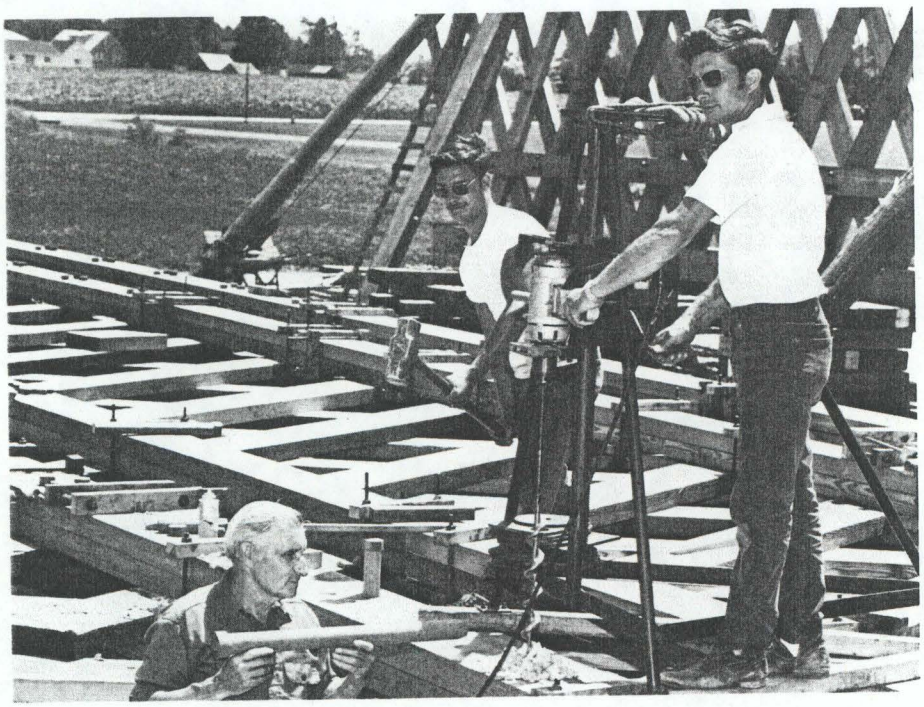
Arnold trimming first 4" x 14" x 32' bottom chord members. Other timber is temporary falsework.
Photo by Doris Grāton

About the middle of May, Arnold, my oldest son, with a helper, started to lay out the south side truss. This truss was 240' long and 20' high when stood up. It contained over thirty thousand board feet of lumber. By late June, we had erected the first truss. Our crew sometimes had a day or two when a visiting covered bridge "Buff" would lend a hand. This would suddenly swell our crew to five, but it was more often three or four workers. One young man, a true covered bridge "Buff", who was known to many visitors as "John, the pilot", has left his flying job in Vermont on several one-week periods to assist in the driving of trunnels and hand-raising of trusses.

TRUNNELS AND TIMBERS

The trunnels are 2" diameter white oak pins which are turned round except for a ¾" square portion at one end. This square top fits into a driving cap. These average to drive one inch with each blow of a 16 pound hammer. The trunnels in this bridge are 11", 24", and 27½" long for different locations in the chords and lattice. We had a total of 2,400 pieces of square stock, which were turned into trunnels.

In the Town Lattice type of truss, such as the Frankenmuth bridge, the trunnels and timbers must live in harmony to be successful. Since the intersecting areas of the timbers are pinned together in a fashion that causes the dimension of the unchanging timber to be made fast to the timber with a changing dimension, we planned ahead to insure that the timber with the changing dimension was stabilized. To do this the timbers had to be reduced to a moisture content of 14 to 15%, which is the reading that we would expect to find prevalent in the average covered bridge climate five years hence.



Milton Grāton, son Arnold, grandson Arnold Jr. placing trunnels. Photo by Glenn Baker

Timber behavior can be likened to that of man. Man can get fat if provided with a barrel of chocolates. He will not grow taller. We must get man worked down through exercise and feed him Quaker Oats, as we might a horse. In this way we can be sure of his behavior. In the other dimension, (height) man is not subject to sudden changes. Timber likewise has no measureable changes in length.

As the timber is stabilized, so also is the size of the hole that is drilled in the stabilized wood. The trunnels were created of timber that was also stabilized. To

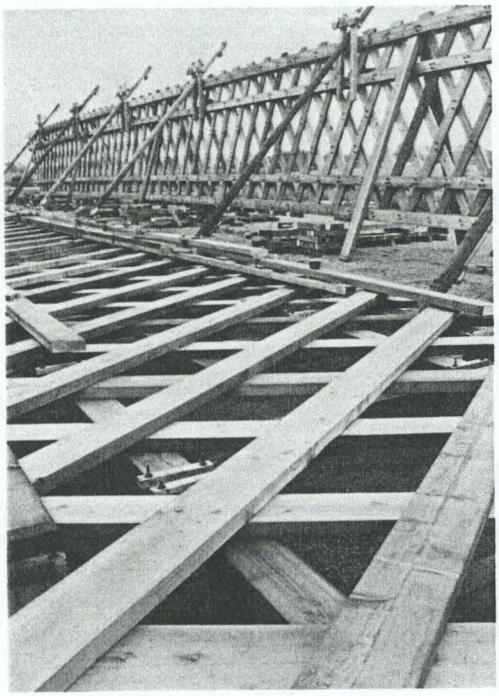
be of wood that is over dried would be to create internal stresses in the framing timber when moisture was reabsorbed. To have a moisture content above 14 to 15%, would mean a loose-fitting trunnel when stabilized; and perhaps sagging trusses.

In the building of the Zehnder's Holz-Brücke, we had only a year to prepare the trunnels. Our stock of stabilized timber would yield only one third of this dimension. White oak is very slow to give up its moisture. The accepted rule for air drying oak is one year for each inch of thickness, or in this case, two and one-third years. To force-dry oak for turning would mean many season checks in the wood and a trunnel head that would fall apart in driving. To overcome this we sawed the squares of trunnel stock 2½" and stuck them up with ½" x ½" stickers. We applied a coat of linseed oil to the ends each second day for five applications. When the outdoor drying season was finished, we restuck the material in our home basement. The material was arranged so that warm air was blown the entire thirty foot length, under the six foot high pile, which was twenty-eight inches in the third dimension. This pile was then covered tightly with polyethylene to contain nearly all the expelled moisture. The heating process was carried on for 12 weeks. We generally heated for 2 hours before our working day, 2 hours after work, and 2 hours in late evening. The heat-off hours permitted equalization of moisture in the oak squares. Some may say that all of this "Old Maid" treatment is unnecessary, but there is a great difference between a good piece of trunnel stock and a stick of fireplace wood.

As the side trusses were laid out and clamped in a curve (14" of cambre), more than 400 complete clamps were employed. Before drilling each cluster of three holes, a short piece of lattice stock was jacked tightly under the hole location to prevent the wood from flaking away when the drill broke through at the bottom

The second truss being raised by manpower. Photo by Glenn Baker

of a hole. More than one-half mile of holes were drilled in this bridge. In the driving of the trunnels a jack was placed under the timber nearby to prevent recoil of the chord, and to increase the net penetration. A penetration of 1" per blow from a 16 pound hammer is considered ideal, so in 24" of timber 18 blows would indicate too loose a fit, and on the other hand, 30 blows would be too tight. In this case of misfit, a slightly larger or smaller auger must be used.

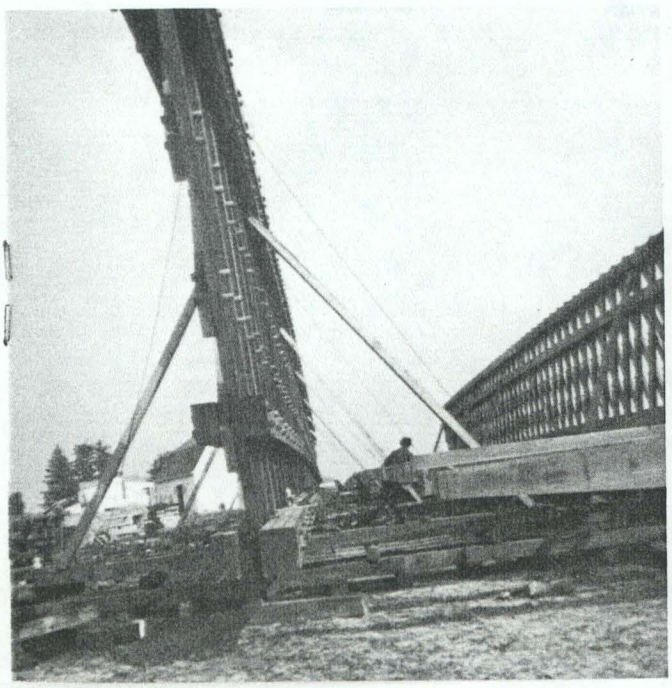


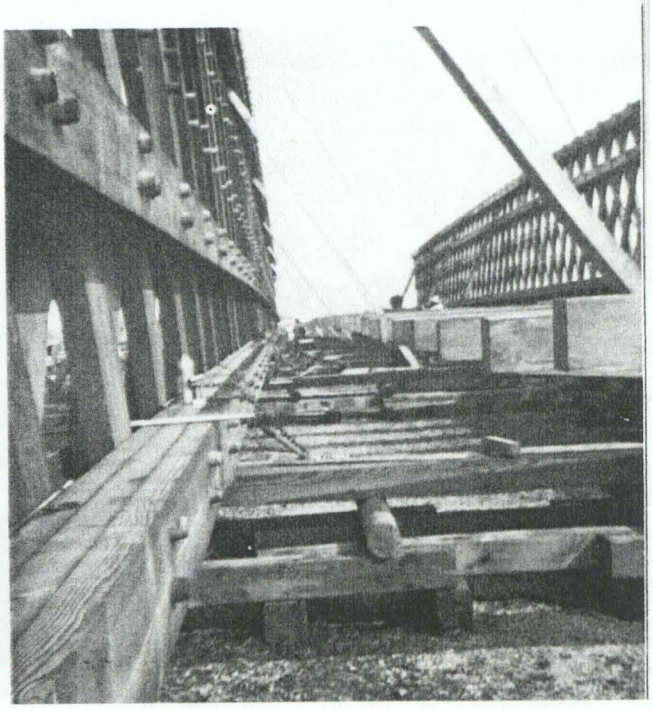
The second truss laid out. Photo by Glenn Baker

When the first side truss had been completely pinned together, the erecting was done by man power. To assure that the truss did not blend in the raising process, it was necessary to shim the bottom chord at numerous points to compensate for the amount of cambre that had been produced at each point. This would maintain a straight line through the hinging points and prevent premature stresses. In erecting the side, seven jacking positions were prepared and jacks placed under the third chord. At these positions, the structure was jacked about six feet, as far as jacking would permit.

From this position to that of an erect truss, the raising was done with ginpoles. The ginpole was stood so as to lean slightly toward the truss, and a lifting yoke made secure around the ginpole. The wire rope that was to do the lifting was secured to the top of the ginpole, then passed through a snatch block at the lifting yoke and returned to another

Lining up floor stiffeners. Photo by Glenn Baker





Threading floor joists through second truss. Truss was moving

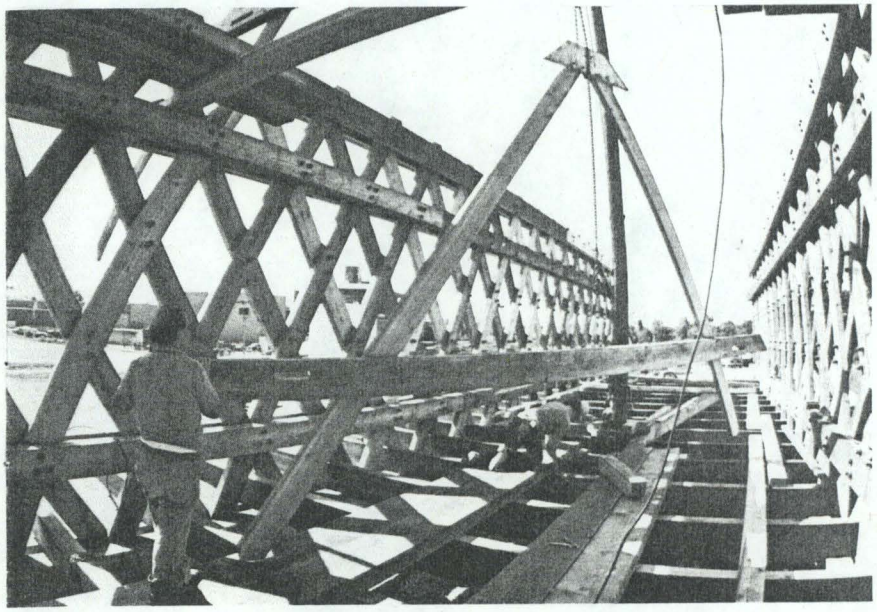
Photo by Glenn Baker

block at the top of the ginpole and finally back to the puller at the ginpole base. Each of the seven ginpoles was equipped in the same manner and the side was ready to raise. Four or five men can raise the side in this manner in one day. The second truss was built and raised by the same method as the first.

After the sides had been raised it was necessary, when a sidewalk is involved, to thread the floor joists through one truss above the bottom chord. The joists are alternated, short and long, so that every four feet there is a joist projecting far enough to support the walk and the long roof over-hang. The second truss was then rolled sidewise into its final position with the unsized portion of the joists firmly against the bottom chords. Every 8 feet a button is fastened up under the bottom chord by means of a 5/8" bolt which passes through a long joist. This helps to prevent swaying of the trusses.

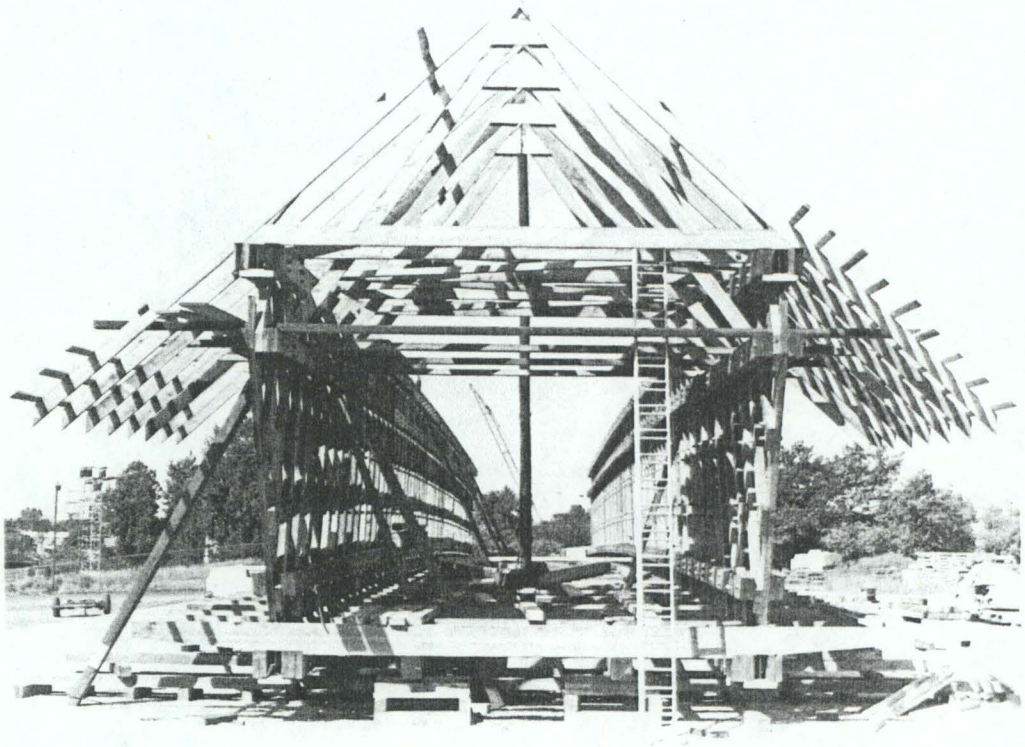
ROOF

A complete roof truss was installed every 8 feet and secured by means of buttons as described above. The cross tie in these trusses had to be framed securely into the top chords to prevent any movement along the chords that might be caused by the lateral bracing. The secondary rafters, on their way from the ridge to the third chord, were also framed into the cross tie to work as knee bracing.



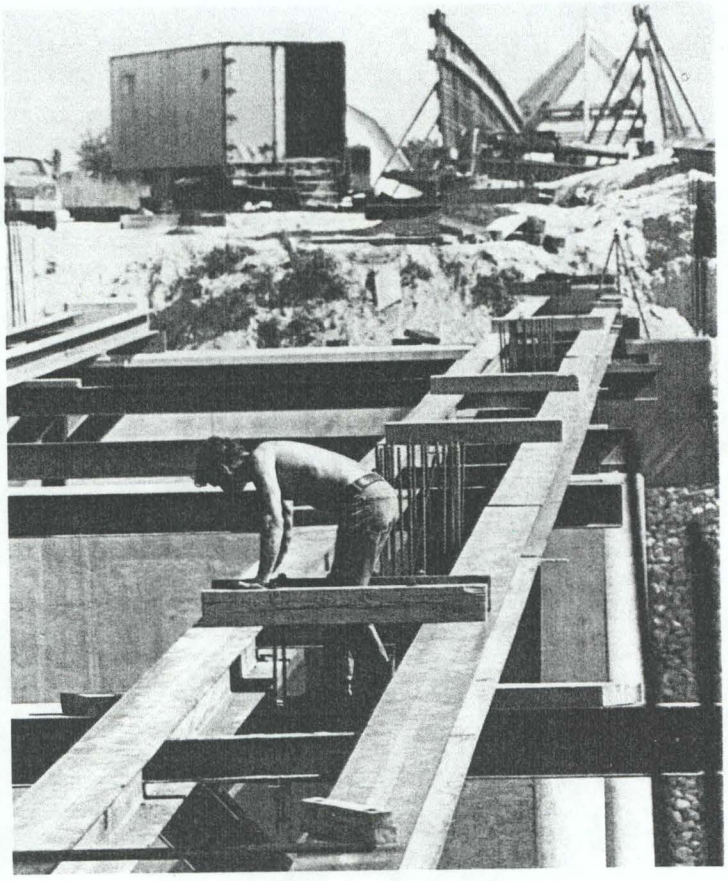
Raising roof truss by means of ginpole.
Photo by Glenn Baker

The thirty-one roof trusses had been fitted at our Ashland, New Hampshire shop, numbered and taken apart. When assembled in the bridge floor, these trusses were raised by a ginpole which was guyed to a V made of heavy timbers which were dragged forward each time a truss was placed. Upon reaching the end of the bridge floor, a 30' extension was built to accommodate the ginpole.



Placing roof trusses and rafters.

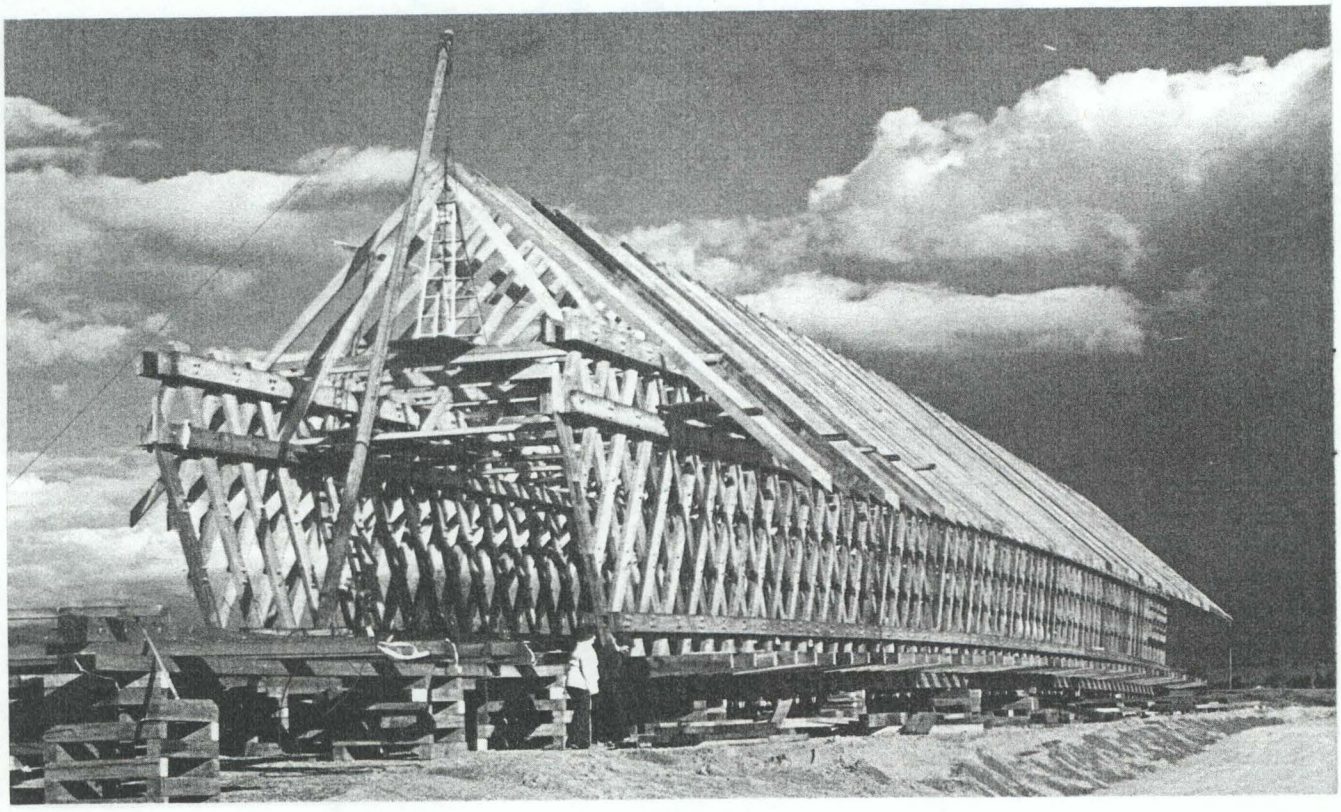
Photo by Frankenmuth News



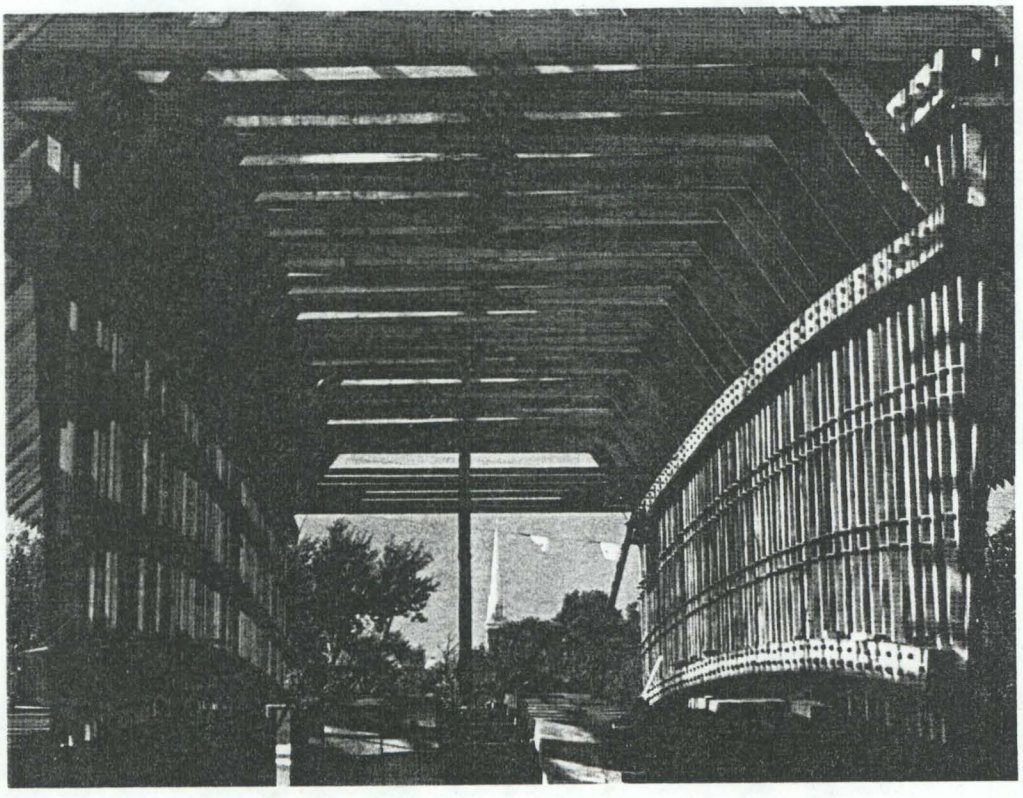
Arnold leveling a tempered steel falsework.
Photo by Glenn Baker

Placing last roof trusses from bridge floor extension.

Photo by Glenn Baker



The 3 foot shingles were nailed to 2 x 4 perlins. These perlins are 16" on center and the shingles are laid 16" to the weather. Having sat on one of the perlins on the roof for 8 weeks, Arnold finally nailed the last shingle onto the south side. The perlins and he had become moulded to produce the fit and comfort of an easy chair.



Showing cambre in trusses. Photo by Glenn Baker

lenn Baker

DORMERS

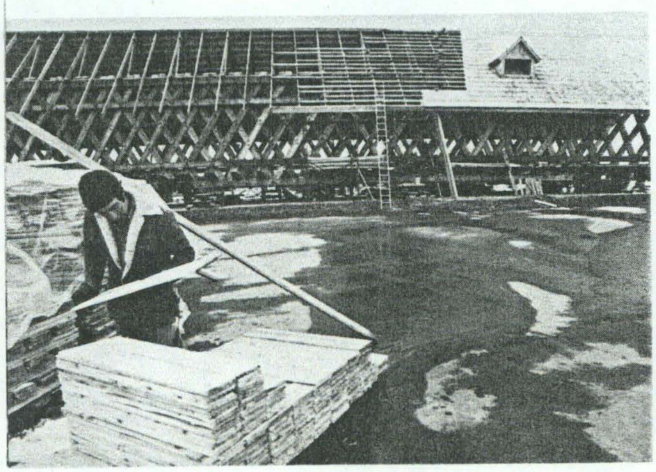
The covered bridge is one structure which can be modified in many ways, to match or be in harmony with its surroundings or to be physically sufficient in an abusive setting. In the case of the Zehnder's Holz-Brücke, it was desirable for the bridge to be strong for bus traffic and yet have the all-around feeling of mellowness and quaint touch of antiquity. It should be friendly to the Bavarian but not

radical enough to offend its Yankee counterparts. When Tiny Zehnder casually dropped a word about dormers, I volunteered that I had yet to see a covered bridge with dormers. He may have anticipated a difference of opinion for in the next breath he said, "This is Frankenmuth". These dormers do add. They allow one to focus his attention on the bridge rather than on the immense roof. We built the six dormers in our shop and brought them as units to mount on the roof. They were set by the use of a ginpole and will be lighted.

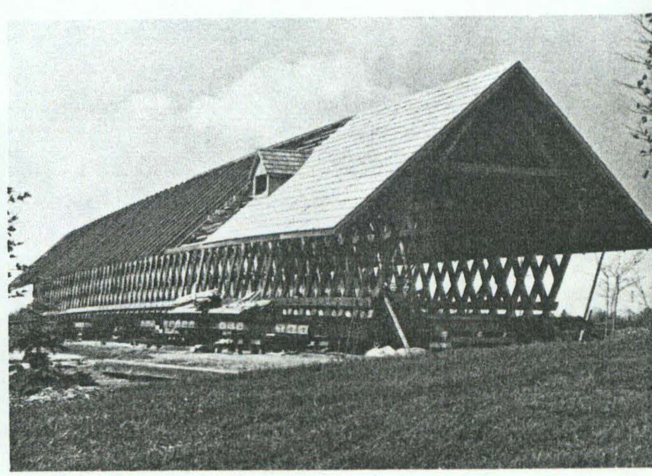
Arnold preparing to lift dormer.

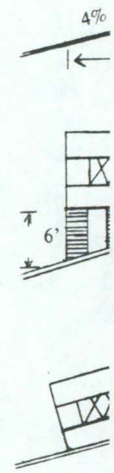
Photos by Glenn Baker

Arnold placing perlins and examining shingles.



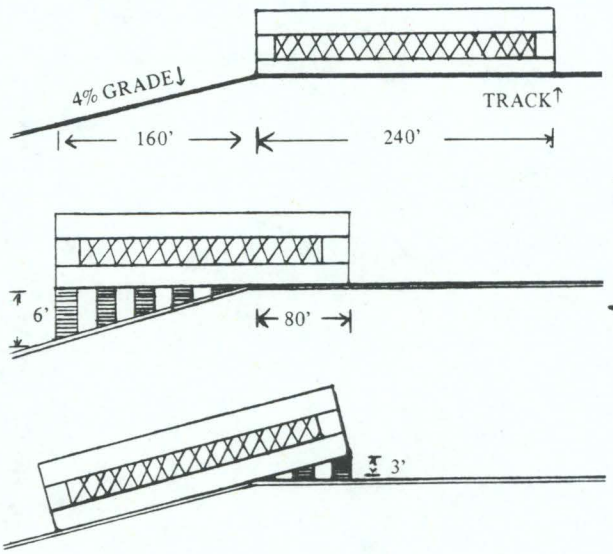
East end shingled.



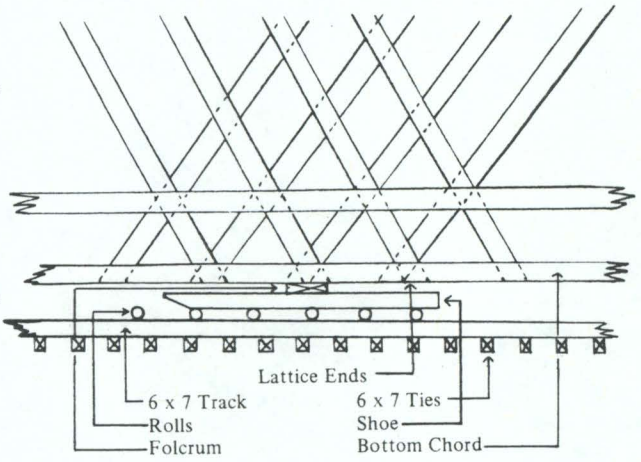


Arthur P(

DOWN GRADE 20' TO THE FINAL LOCATION



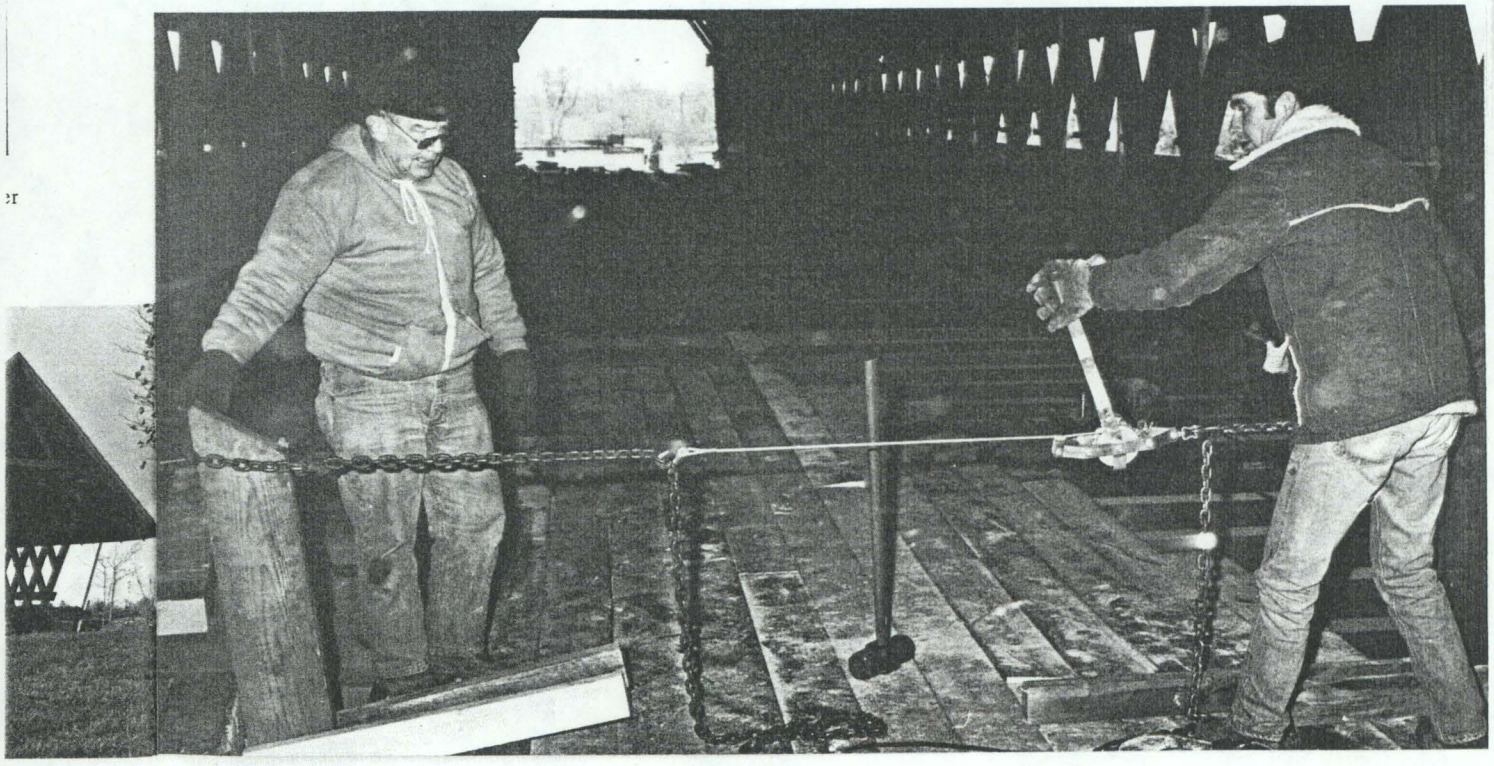
Descent of Bridge.

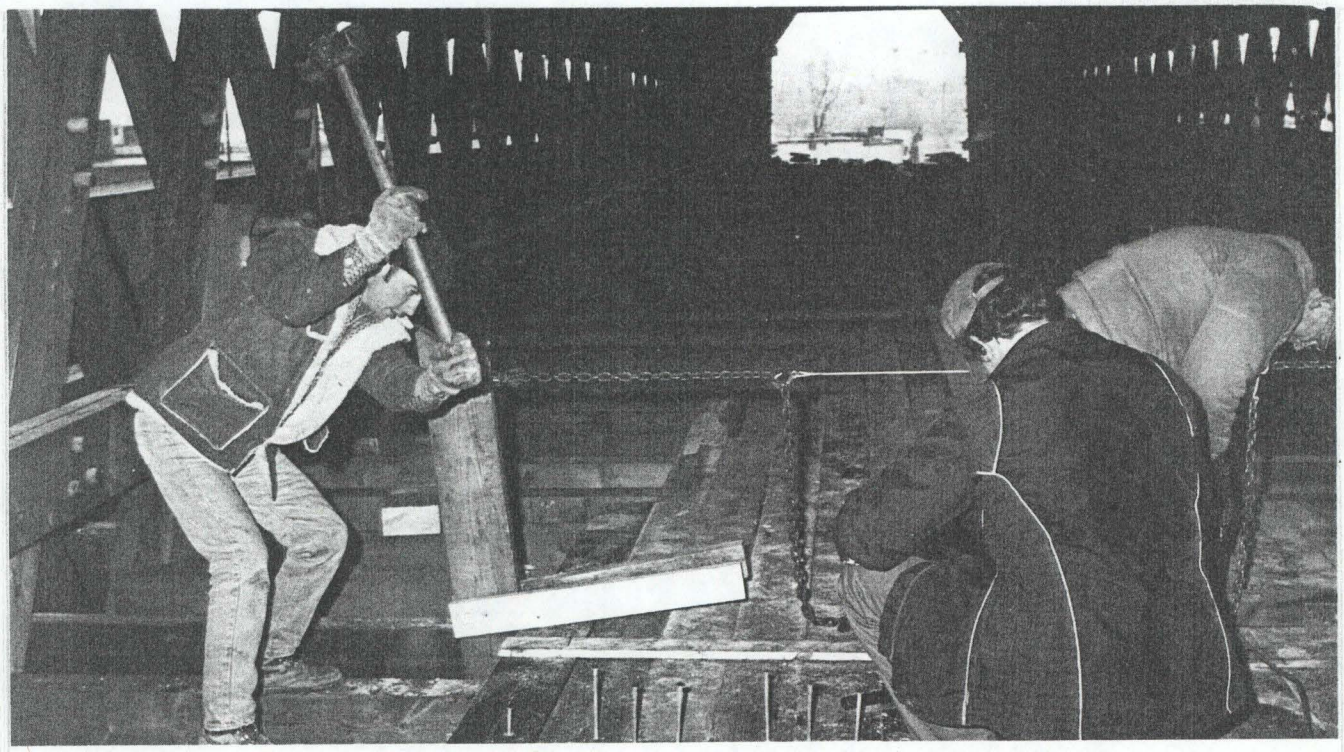


A typical roll assembly for the moving of the bridge toward the river. The height or thickness of the folcrum varies to compensate for cambre in truss.

After the center 9 feet of the bridge floor was placed, the structure was ready to move. It was to be rolled about 500 feet in making a vertical descent of 20 feet. The west end of the bridge was at a point where the 4% grade met our level assembly area. We placed the bridge on 240' of level track with rolls at twenty locations.

Arthur Potter and Arnold compressing floor plank. Photo by Glenn Baker





Arthur Potter drilling pilot holes in floor plank. Jeff Baker placing spikes. Arnold driving spikes. Photo by Glenn Baker

One could coin a new term, "Bavarian Cooperation", after an experience in a strange town where contractors, church builders, insurance men, maintenance professionals, horse teamsters, ox teamsters, carpenters, commercial pilots, covered bridge buffs, printers, retired bookkeepers, and farmers came to offer their help in the bridge moving. There was need to increase our personnel from a total of 3 or 4 to 15. These good people helped us during the moving and in some cases for weeks

Capstan before oxen started moving forward. Photo by Glenn Baker

enn Baker

before, with no thought of financial reward. They seemed to want to be a part of what they considered a "once-in-a-lifetime" town project.

At this time we had to excavate some 500 cubic yards of earth and place a 6" layer of crushed limestone to bring the grade to match the steel falsework at the west side of the river. It extended east with a 4% rise in grade to the break that was originally at the west end of the bridge. All that was left to do was to build our little double track railroad. We placed our 6" x 7" - 4' ties, 12" apart, in straight lines, and covered with a track of 4 or 5 lines of 6" x 7" timbers in 8 foot lengths.

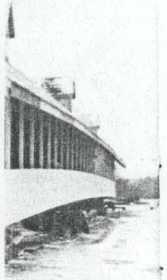
The track was laid 200 feet down the grade. We then built an extension of the level track for a distance of 160 feet toward the river. This section of blocking between the now level track and the down grade track was 0' at the bridge end and 6' at the lower end. The bridge was then rolled forward 160'.

IN THIS FORWARD MOVE

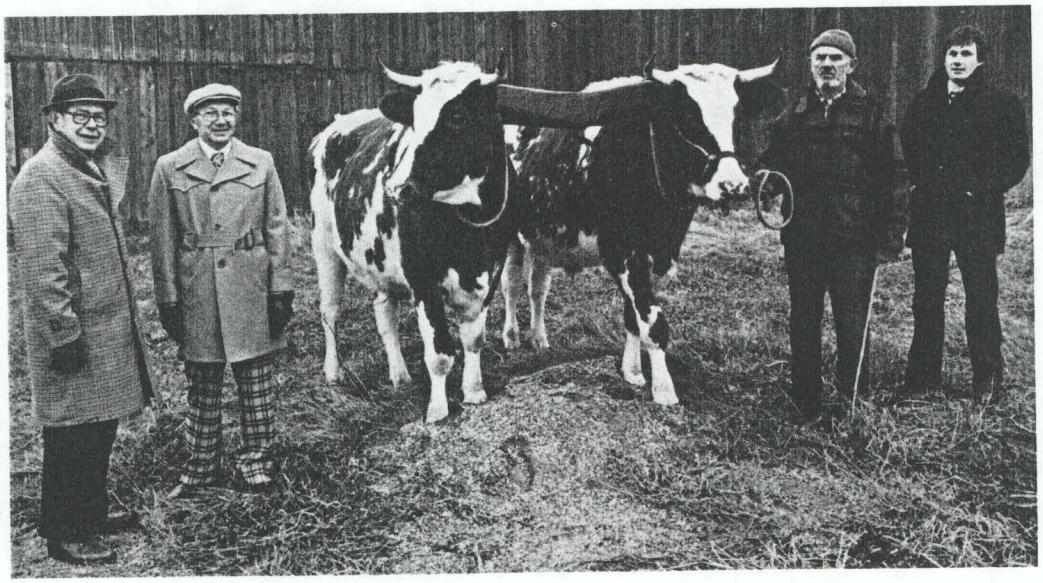
We used the power of the oxen at the east end. With the price of Arabian oil going up each day, we decided it was more sensible, and economical to go "back to the farm". Surely Tiny Zehnder's herd of 250 head of prize cattle would not mind sharing a few bouquets of alfalfa with these cute little strangers!

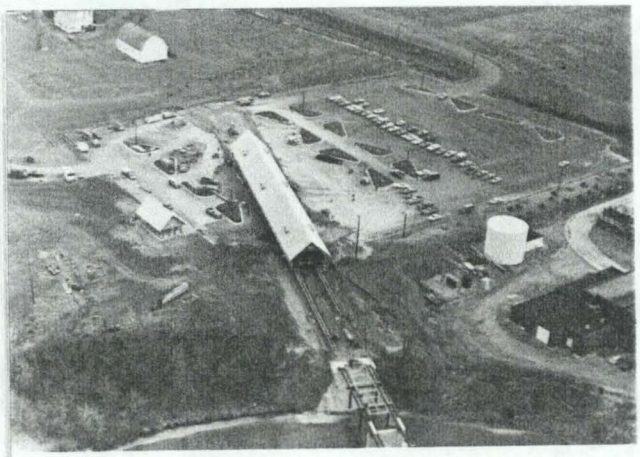
When the oxen moved in, the board and room as agreed by Zehnders' was okay. Now, Mr. Hayhoe explained that his "boys" had been pampered and he could find no warm shower in the barn. He was right; there was none. Mr. Hayhoe was proud of his well-groomed oxen and promptly made arrangements for a march through the local car wash. Here each morning they were prepared for their public appearance by having a warm soap and water shower down from the "wading" line. The oxen were not disappointed in their accommodations!

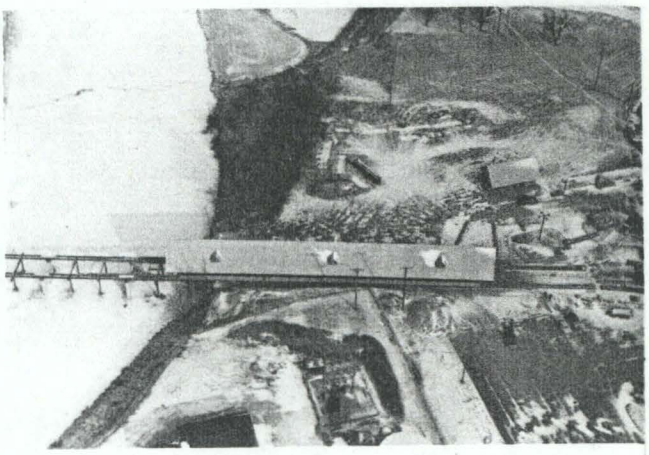
lenn Baker



Oxen off to their morning shower. Photo by Glenn Baker





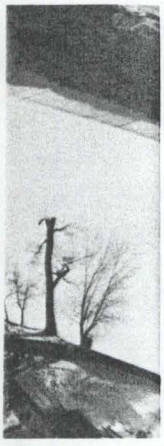


Aerial views of progress down the 4% grade.
Photos by Glenn Baker

The capstan was set up at the east end of the bridge. With the anchor at the east bridge abutment and the opposing force secured in the east end of the bridge floor, the oxen would give the appearance of pushing the bridge toward the river. After taking up the "slack" in the system, a forward movement of 3½" per revolution of the capstan could be assured.

As the bridge moved forward we had to straighten unruly rolls and move the loose ones around forward to enter again at each of the 20 stations.

One rainy day it was estimated that there were over 200 people under the bridge. None of them seemed to be afraid of the operation. It takes a bit of diplomacy to be able to tell all those folks how welcome they are and still try to work



in the very little remaining space. There rests the difference between the wooden covered bridge and the concrete monsters.

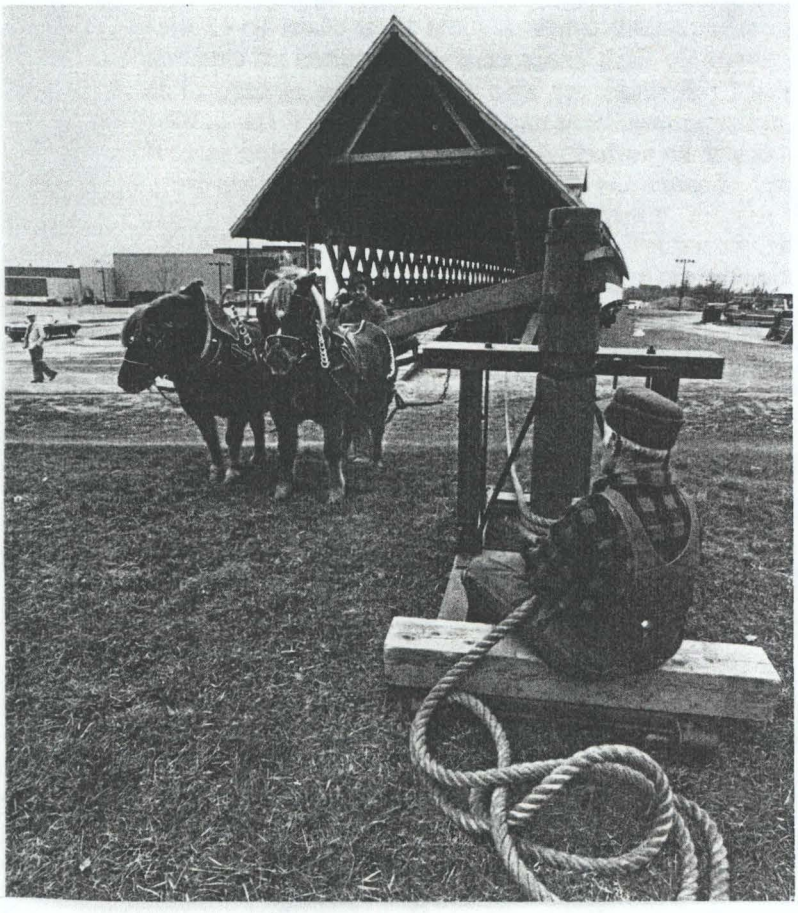
The point for our giant "teeter board" was established at the break in the grade and we proceeded to lower the west end of the bridge 6 feet while raising the east end 3 feet. During this operation we maintained the previously established tangent along the 240 feet of the bottom bridge roller shoes.

Having accomplished the changing of roller bearings from level to 4% grade, the next procedure was to build in blocking to hold the track from the grade-break east for 80 feet. This blocking was also to hold track from 0 to +3 feet from level. The rolling positions were all fitted with shims to a **precise** plane and then the jacks were removed.

At this time we had moved the capstan to the west side of the river, in the parking area. Though the bridge was nearly 400 feet from its final position the capstan would be only 30 feet from the west portal when the pull was complete. Oxen belonging to Mr. Alfred Hayhoe and Mr. Lloyd Maynard alternated in pulling as did two two-horse teams belonging to Mr. H. Reed and Mr. Sargent. Each time a team pulled the pole of the capstan around the circle, the bridge advanced 3½ inches.

To prevent the estimated 230 tons of now dry-land bridge from rolling out of control, we placed two snub-lines of 1¼" steel cable. These lines were secured to the understructure and extended for 150 feet to the rear, where they were attached to an eighteen ton bulldozer. When the "balance of power" between bulldozer and oxen became a smooth operation, a ten-wheel dump truck with a 12 cubic yard load of stone was substituted for the bulldozer by Mr. Lentner and his very accommodating "little" sons. They had use for the bulldozer elsewhere.

The resistance to forward movement in the bridge was maintained evenly by the heavy snub lines being held tightly enough to keep them a certain distance above the ground. This made a ready signal for more, or less, line restraint.



The oxen had a mechanical advantage of about 10 to 1 (disregarding friction) at the capstan. This was multiplied by 9 through a pair of quadruple blocks in the rope within the bridge, on the floor. When the rope crossing the river would become very straight, it was necessary at times to signal for a slight relaxing of steel cable at the other end of the bridge.

At first the progress was quite rapid. It was easy to work on the graded surface. We moved nearly 70' the

Henry Reed and his horses make the first pull forward.
Photo by Mr. Herzog

Arnold Graton, Milton Grāton, Tiny Zehnder, Bill Zehnder and John, the Pilot, entertain the Hayhoe oxen.
Photo by Glenn Baker

second day on this grade but soon reached the edge of the falsework where all placing ties, track and rolls had to be done from cat-walks. These walks also had to be built as we progressed. Material had to be carried along the cat-walks or handed down through the holes which were left open in the bridge floor. Much of the time the carrying distance reached 200'. About ten days were required to place the tracks for the first level move, and to move the 160'.

The plan had been made in early November to start down the grade on January 18th and to arrive in place spanning the river at 12 o'clock noon on January 29, 1980. I kept the tension on the 1½" rope during the entire pull. My accomplishment was producing an average of 75 pounds of tension on the line for a total of nearly a mile.

The oxen and horses were asked many times to yield their place to special interest groups ranging from a complete fifth grade class who walked all over me to the sedate Michigan Historical Commissioners who proved to be as careful as the oxen. Though a substantial net retaining force had to be maintained for safety, for short periods, it could be reduced to perhaps 4 or 5 tons. I had waited several days and anxiously for the arrival of members of Women's Lib who were reported to have threatened to take over my job, but no relief came.

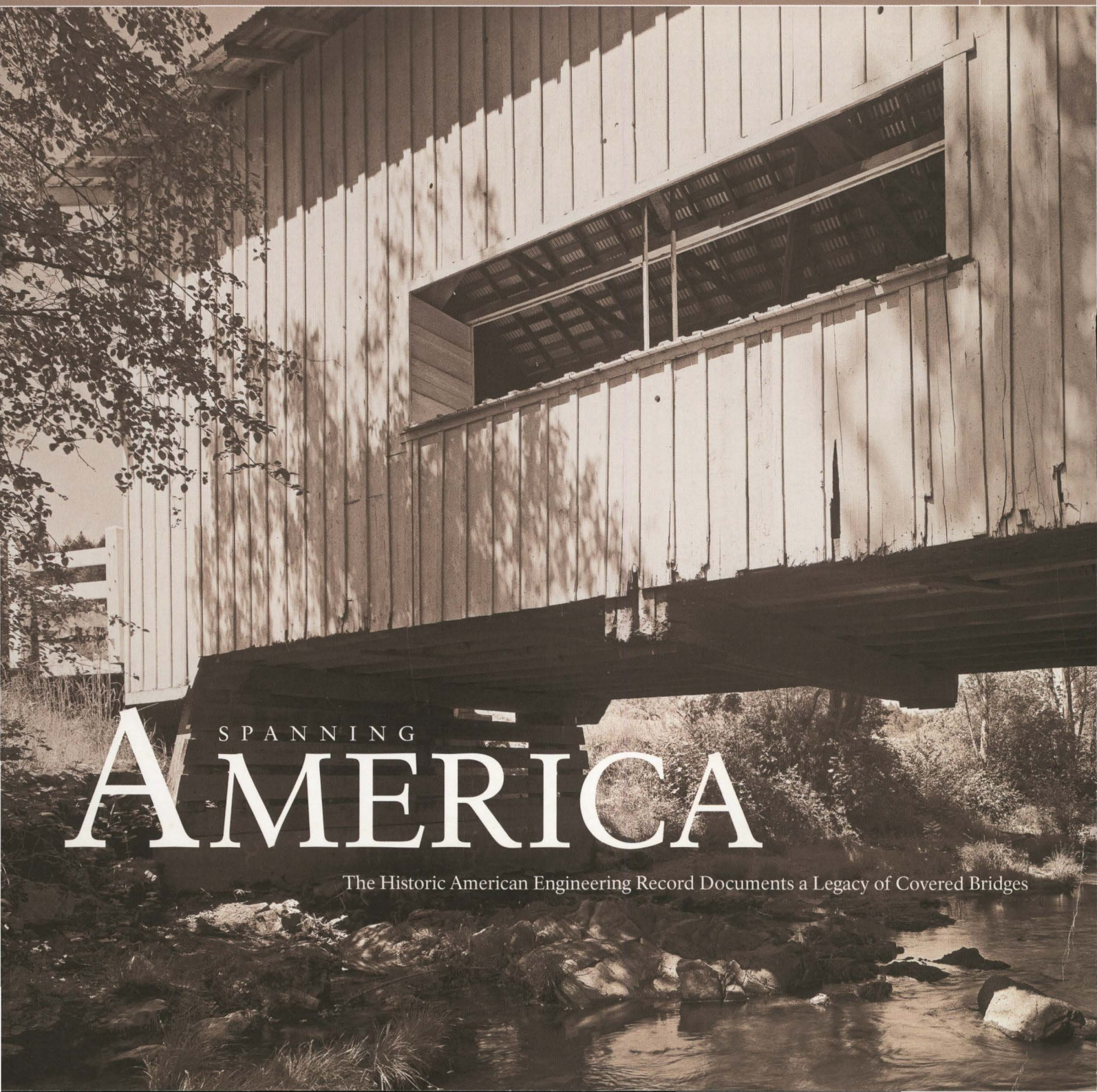
On the final day of pulling, we were to arrive at noon! We placed oak blocks against the concrete abutment to maintain a 1" clearance, and then pulled until the bridge touched against these spacing blocks. It was a cold day and no one had a watch. The ribbon on the entrance to the north side was cut and 400 people swarmed onto that sidewalk. They proceeded across the end to the south walk and were half way back across the bridge when the noon whistle blew at The Star of West Flour Mill. We were at least 4 minutes early!

As Tiny Zehnder stepped off the bridge sidewalk he appeared happy and relieved. He said as he held out his hand to shake my rope-blistered one, "I am glad to see that the bridge reaches across the Cass River! Now, lets' have a Bavarian Chicken Dinner".

Tiny Zehnder and Milton Grāton.
Photo by Glenn Baker

COMMON Ground

PRESERVING OUR NATION'S HERITAGE WINTER 2004



SPANNING AMERICA

The Historic American Engineering Record Documents a Legacy of Covered Bridges

FIRST WORD

Bridges from the Past

BY SENATOR JIM JEFFORDS

IN 1837, THE PEOPLE OF PITTSFORD, VERMONT, contracted 19-year-old Nichols Powers to build a bridge over Otter Creek. Due to his youth, the town demanded that his father agree to pay for any wasted materials. Young Powers silenced the critics when the bridge went up without a flaw and without wasting any of the valuable timber. The bridge remained there for 94 years. The only reason it went down was because Pittsford decided a modern metal bridge would be safer. Yet some said the bridge was as strong that day as the day it was built, especially after seeing that it supported the 20-ton machine that helped to demolish it. **POWERS WENT ON TO BECOME** one of the greatest builders of wooden bridges that the world has ever known. He built hundreds of covered bridges from Maine to Maryland, and at one time held claim to the majority in New York and New England. **MAYBE HIS GREATEST ACCOMPLISHMENT** was the two-lane Blenheim Bridge in New York, originally labeled Powers' Folly. Few believed the 210-foot span would handle its own weight, let alone traffic. Before removing the scaffold that supported the bridge during construction, Powers stood in the middle shouting, "If she goes, I'll go with her!" The bridge handled daily traffic until the 1930s. It remains a landmark, one of the longest single-span wooden bridges in the world. **UNFORTUNATELY, CONSIDERING WHAT** Powers went on to accomplish, few people recognize his name outside the small community in which he began his career. Many of our covered bridges are suffering the same fate. Where once thousands of bridges spanned our nation's waterways, today fewer than 800 survive. **WITHOUT PROPER MAINTENANCE,** accurate information, or sufficient resources, we may lose the few remaining covered bridges. Caring for these national treasures is beyond the capacity of the towns and counties that own them. Diminished collective knowledge and general distrust of covered bridge dynamics have caused other problems. Ironically, even today a covered bridge can be more appropriate than its steel counterpart. Anyone whose car has lived through the New England winter knows what salt does to metal, but salt has little effect on wood. The only thing that weakens wood is moisture, and safe beneath their vaulted roofs, many covered bridges have lasted more than 150 years. **TO PROTECT THESE VALUED LANDMARKS,** I introduced the National Covered Bridge Preservation Act in 1998. This legislation, which became law that year, directs the Secretary of Transportation to maintain a list of historic covered bridges, develop education and history programs, and research the most appropriate techniques for protecting covered bridges. Since the passage of that legislation, more than $18 million has been spent to preserve these national treasures. **THE FUNDS HAVE GIVEN** states, historic communities, and preservationists the means to protect this legacy. Covered bridges are not simply relics of the past, they are majestic symbols of our rural history. And in the midst of our busy, frantic lives, they are reminders of a simpler time, of an era we must preserve and remember.

"Covered bridges are not simply relics of the past, they are majestic symbols of our rural history. And in the midst of our busy, frantic lives, they are reminders of a simpler time, of an era we must preserve and remember."

Senator Jim Jeffords has represented Vermont in the U.S. Congress since 1974. Elected to the House of Representatives that year, he won his Senate seat in 1988. He is the ranking member of the Senate Environment and Public Works Committee and serves on the Senate Finance, Veterans' Affairs, and Health, Education, Labor, and Pensions Committees. He also serves on the Senate Special Committee on Aging.

But perhaps its most important archeological potential lies in the row of wooden houses that once stood here. As Potter observes, "L'Hermitage has the potential to produce not one but a number of separate and distinct residences. That means multiple features and distributions of objects that can be compared to each other." In other words, this may be the very rare kind of site where specific relationships and exchanges of ideas, goods, and individuals among households are found and evaluated. In such a place we can come face-to-face with the former residents and the day-to-day realities of their lives.

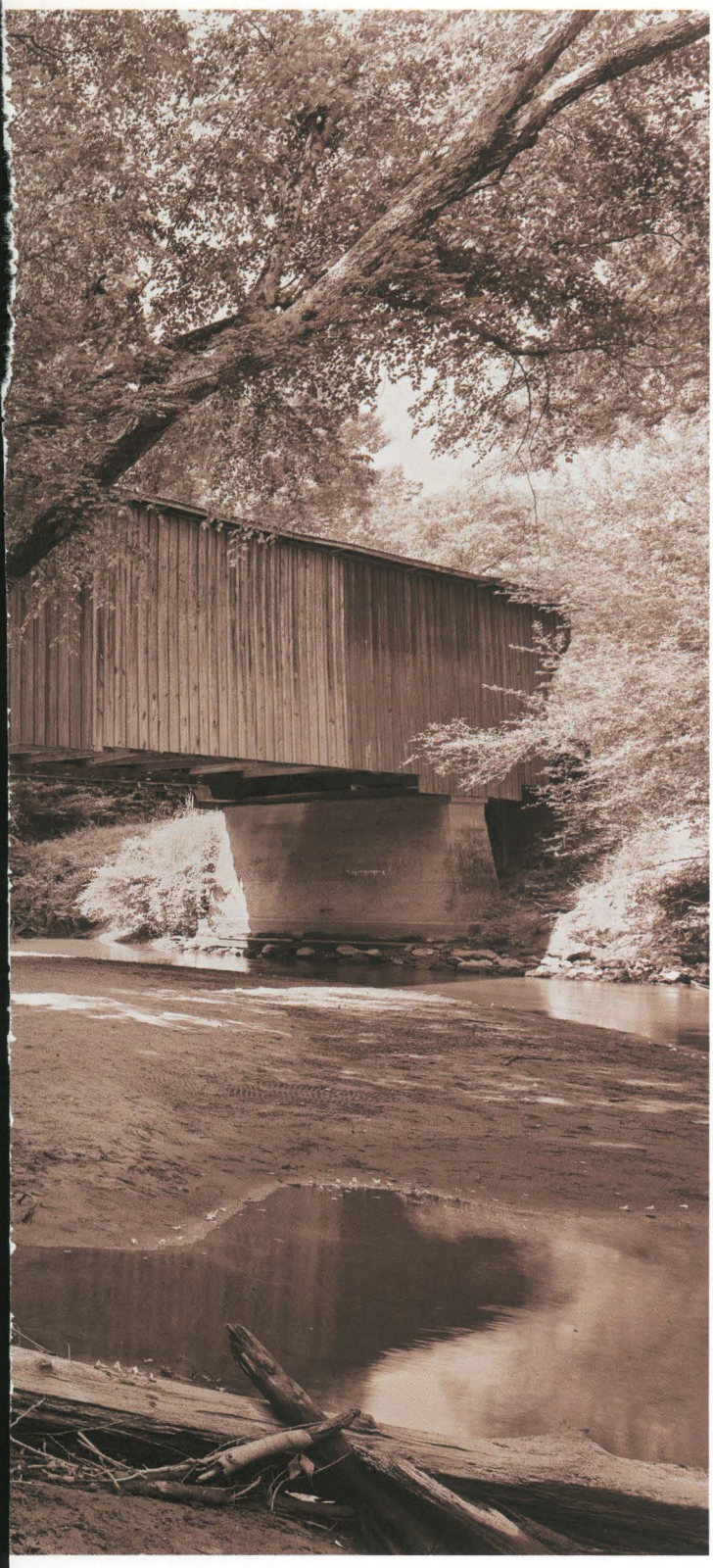
AFTER I HAVE A LOOK AT THE ARTIFACTS, AND CAREFULLY put them back in the bag, I spend a few minutes with Joy and her crew, making the kind of small talk about the vagaries of field work that happens whenever archeologists get together. It is late afternoon, and time to close up for the day. The crew loads their vehicle; we all shake hands and go our separate ways. I have an hour-and-a-half drive home, so there is ample time for reflection. For a while, the technical complexities of the farm's past absorb me: the gradiometer results, an unusual button just discovered that day, the need for additional research in Haiti and France. But larger considerations soon crowd out the minutiae.

In the end, archeology isn't only about artifacts or soil profiles or report deadlines or databases or project budgets or surveying notes; it's about people. Those broken pieces of pottery were once held by other hands, that odd-looking button once closed a man's jacket against the cold. The small objects connect each of us directly to other lives. The real promise of the archeology at Best Farm is that one day these lives may be reconstructed. The Vincendière's slaves were our countrymen and women. Their status as mere property leaves them with almost no written story, and the anonymity robs them of their voice. I imagine that voice could speak about determination, perseverance, and hope in conditions that might crumble the strongest among us. We are all diminished by their silence. Through the excavations at L'Hermitage, perhaps we will finally hear them.

For more information, contact Joy Beasley, Monocacy National Battlefield, 4801 Urbana Pike, Frederick, MD 21704, (301) 668-3647, email joy_beasley@nps.gov, www.nps.gov/mono. Joe Baker is an archeologist with the Pennsylvania Department of Transportation and a member of the Society for American Archaeology Public Education Committee. He can be reached at (717) 705-1482, email joebear81@aol.com.

Above: ***Red Oak Creek Bridge, Merriweather County, Georgia.*** *Rural icons today, covered bridges were 19th-century necessities, the product of a growing population, economic need, and the burgeoning field of engineering and design. This specimen dates from the 1840s.*

ALL PHOTOS JET LOWE/NPS/HAER; DRAWINGS NPS/HAER



The roads that wind through the Catskills are lightly traveled. The lonely villages, the ramshackle farmhouses, the looming mountains half cloaked in clouds call to mind the bewitched landscape of Washington Irving's imagination. It's a place that moves with its own tempo. If time flows quickly out on the turnpike, one suspects that here the days eddy around places that recall the early frontier. Blenheim: the practical ambition of the early Germans. Schoharie: the ancient voice of the Iroquois.

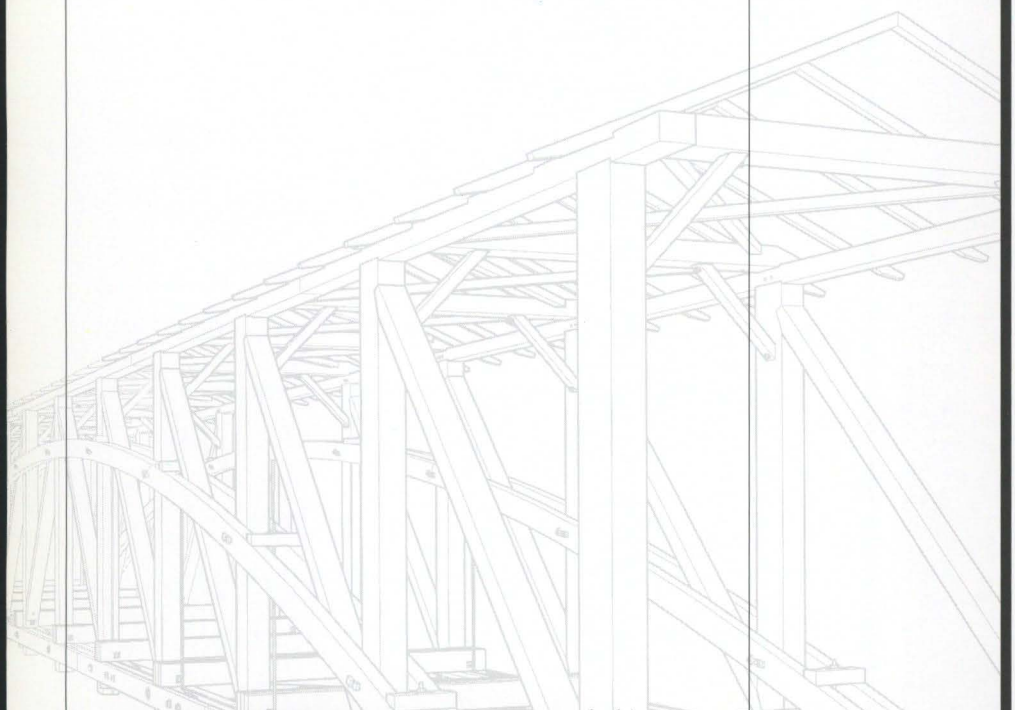
So when a traveler rounds a bend and approaches a broad, shallow waterway, an otherwise surprising sight seems completely logical: a large covered bridge, dark brown and weathered, cut off from the main road, sitting high and dry as it were, leading from nowhere to nowhere.

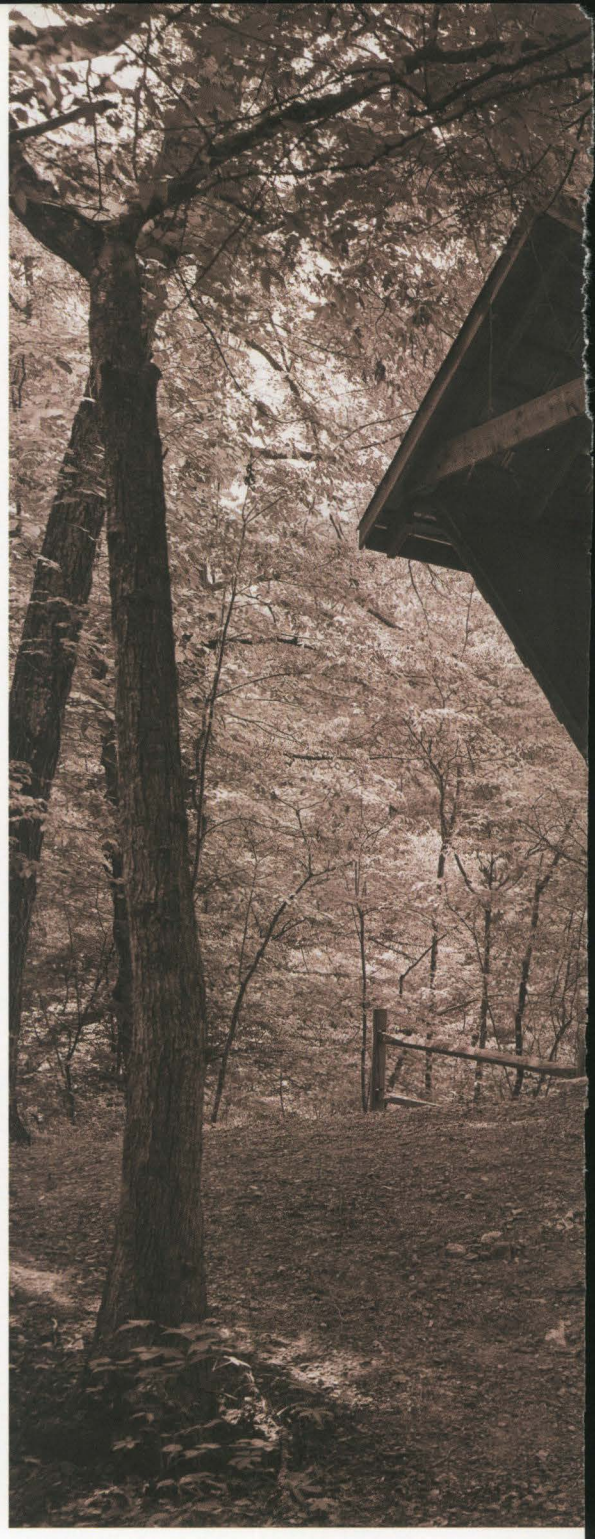
SPANNING AMERICA

by Joe Flanagan

The Historic American Engineering Record documents a legacy of covered bridges

Photographs by Jet Lowe





JET LOWE OF THE NATIONAL PARK SERVICE unpacks his camera, tripod, and film holders on the rough gravel road. This is the last of six covered bridges in Lowe's two-week swing through New York, New Hampshire, and Vermont, part of a congressionally authorized initiative to preserve these icons of 19th-century America.

A photographer with the Historic American Engineering Record, Lowe prowls defunct mills and auto factories, documenting historic industrial sites and relics of early engineering. He's at home around steel and machinery, but the echo of his steps on the cavernous structure's scarred planks evokes a distinctly agrarian world.

National Park Service architects made measured drawings of Blenheim Bridge in the 1930s, which are part of HAER's vast archive of historic documentation at the Library of Congress. With the addition of Lowe's photographs—and a historical report—Blenheim Bridge will be, in a sense, recreated there. HAER aims to record some 60 bridges by the end of the three-year project, in measured drawings as well as photographs and written histories.

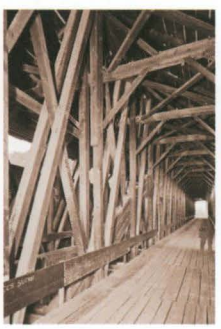
Blenheim Bridge is one of the world's longest wooden covered spans at approximately 210 feet between abutments. Lowe, looking up at the elaborate geometry, says "in scale and size this was the pinnacle of the technology."

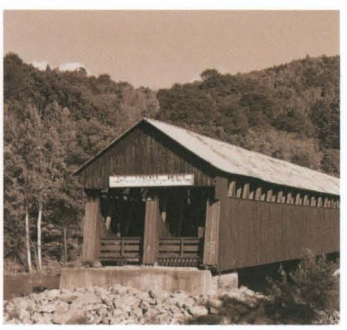
Like old gristmills and rusting farm equipment, covered bridges have always charmed tourists exploring the nation's backroads and byways. But they mean much more to a loose confederation of preservationists, historians, craftsmen, and advocacy groups. David Wright, president of the National Society for the Preservation of Covered Bridges, calls them "documents of the age that produced them."

Above, right: Variations of the wooden truss proliferated in the covered bridge boom of the 19th century. Designers patented their own versions, which builders had to pay a fee to use. ***North Carolina's Bunker Hill Bridge, right,*** *features a rare truss designed by Civil War general Herman Haupt. Only two of these bridges exist today.*

The HAER project is part of an initiative known as the National Historic Covered Bridge Preservation Program. A result of legislation introduced by Senator James M. Jeffords of Vermont, the program funds repair and restoration while promoting research and outreach.

The Federal Highway Administration administers the program, with about $25 million in grants





Above left: Interior of Oregon's Larwood Bridge. *Center and right:* Blenheim Bridge in New York's Catskills. *The site of political rallies and weddings, covered bridges took on social roles not likely anticipated by their builders.*

awarded since 1999. Restoration grants go to the states, who must make the case for their threatened bridges. Spans must be listed in (or eligible for) the National Register of Historic Places, and must be preserved according to standards set by the Secretary of the Interior.

When HAER received a $1 million grant for research, one of the first steps was convening a group of historians, architects, engineers, and craftsmen, which yielded a list of important bridges along with plans to develop a traveling exhibit [see sidebar, page 35] and a database to monitor the condition of the bridges.

Between 5 and 10 bridges are lost every year. Some fall victim to floods, some simply decay with neglect. Many are the objects of arson. Others are compromised by well-intended alterations—what one advocate calls "demolition through redesign."

In the Mind of the Builder

HAER staffers are like forensic portraitists, documenting structures that sometimes have been abandoned for decades. On occasion, they are the last sympathetic visitors before the wrecking ball swings.

However, Blenheim Bridge, built in 1855, is not threatened. It was designated a national historic landmark in 1964. In addition to being one of the world's longest covered bridges, it is one of the few two-lane varieties that survive. Lowe puts his hand on the structure's central arch, nearly black with age, still bearing the marks of the chisels and broad axes wielded by the builders. "This was probably virgin timber," he says. "Some of the pieces are over 30 feet long. And look how many there are."

Lowe seeks out the telling features to photograph. He often looks at the center first. "There's usually something interesting going on with the timbers," he says. "The older bridges are very expressive that way . . . you can see what's under tension and what's under compression." He examines the cross bracing that supports the roof, where it intersects with the collar ties and upper framing. "What I plan to do is shoot that nexus up there in the middle," he says.

Lowe positions the tripod on the planks as Schoharie Creek rushes below. With the shutter open and a dark cloth over his head, he takes aim at the intersecting timbers, and it's not simply a record of the

Above: Neal Lane Bridge, Douglas County, Oregon. Local building traditions produced styles that varied from region to region. Western bridges have a distinct appearance compared to those built in New England.

framing he's after, but a glimpse into the mind of Nichols Powers, bridge builder.

Native Ingenuity

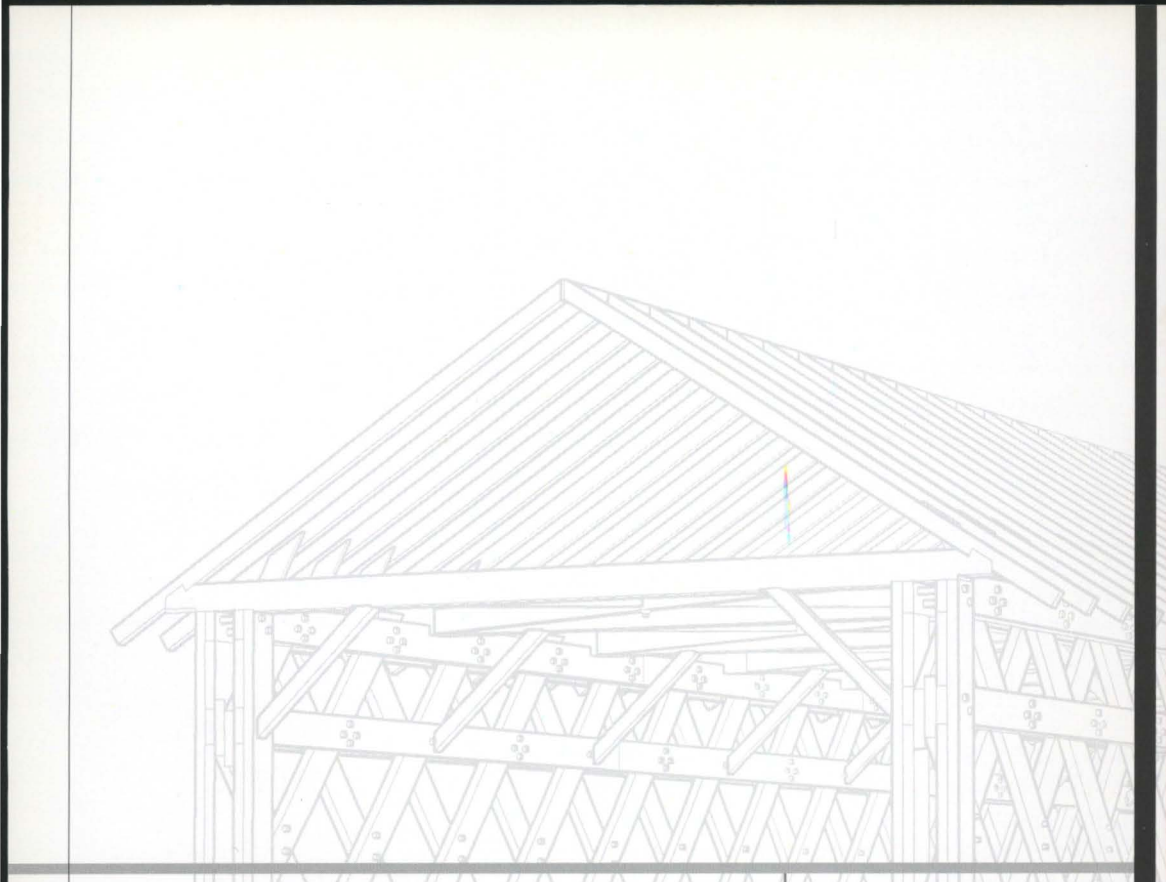
The nation's oldest bridges are in New England and the Middle Atlantic. Some on the West Coast predate those of the Midwest because of roads needed during the Gold Rush.

In the nation's early history, the waterways of the East were major travel routes, but by the 19th century they were an obstacle to the progress of an expanding young country. When the first covered bridges appeared, in the early 1800s, they borrowed an innovation developed in Europe centuries before: the wooden truss. Engineers and carpenters took liberty with the technology and before long variations proliferated, the new forms usually known by the surname of their inventors, Paddleford, Partridge, Haupt, Burr. Bridges came to be classified by their trusses. Huge, rough-hewn assemblies of timber, the trusses were carefully calculated equations of compression and tension.

Truss bridges could span much longer distances than the arched stone structures of old. It soon became evident that an uncovered bridge would rot in 10 to 15 years. Protected, they are as close to permanent as wood can be. Some have stood for well over a century and a half.

Above: The Flat River flows beneath White's Bridge in Michigan, built shortly after the Civil War.

Lowe puts his hand on the structure's central arch, nearly black with age, still bearing the marks of the chisels and broad axes wielded by the builders. "This was probably virgin timber," he says.



Searching out the builders is an excursion into 19th-century myths and realities. The taciturn, semi-literate New England timber framer—the bridge builder of the public imagination—is not quite an accurate portrayal, or at least not in the early years. The first designers were educated men, motivated by personal interest, who kept abreast of the latest ideas by reading professional publications, says Joseph Conwill of the National Society for the Preservation of Covered Bridges in a recent conference paper. "It was not until the middle of the 19th century that engineers and architects developed professional organizations and formal certification," he says. "Indeed, before the 1840s, there was no commonly accepted body of mathematics for stress analysis."

The earliest bridges were custom designed. But before long, designers and builders began patenting plans. Standardization took hold fairly early. Like kit houses, the bridges could be assembled with prefabricated parts transported to the site.

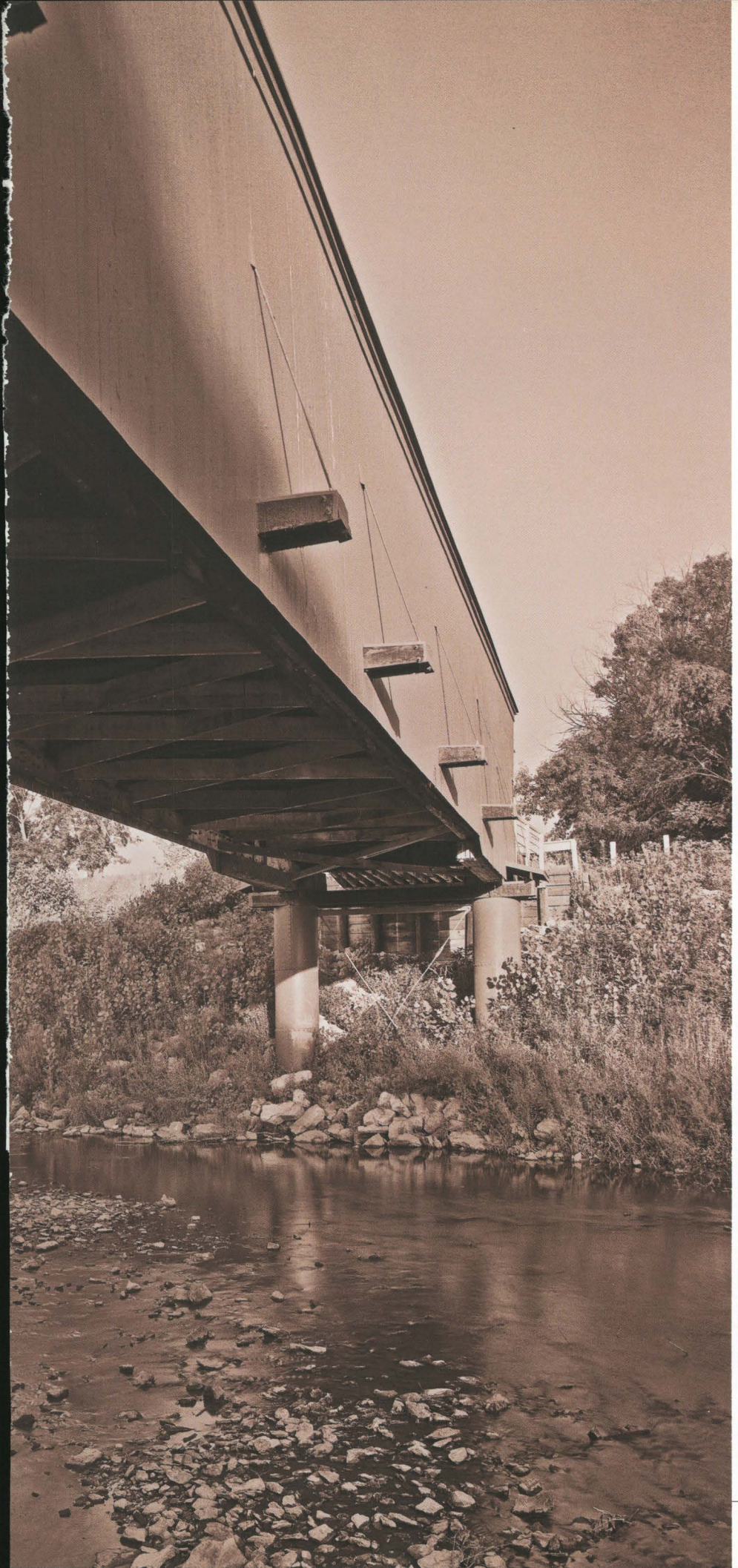
But in some places, regional culture held sway, leaving its mark on bridge styles. In New England and Pennsylvania, where there was a strong craftsman tradition, individual builders handled the job from start to finish. Standardization never got much of a foothold in the area.

So the rustic bridge builder of lore has at least some basis in fact. Many were farmers moonlighting as carpenters. Others were millwrights who took on the occasional bridge. Says Lola Bennett, the project's lead historian, "Most had no formal training, but a lot of mechanical aptitude and common sense."

Historians estimate that at the peak of their popularity, there were some 14,000 covered bridges in the United States. Today, about 800 are widely scattered around the country, most in Pennsylvania, Vermont, Ohio, and Indiana.

Many states have covered bridge societies, which not only try to raise awareness, but fund repairs to ailing and endangered spans. These groups frequently work with state departments of trans-

Above: Brown Bridge, built in Vermont in 1880.
Right: Holliwel Bridge, Madison County, Iowa.
Building a bridge in a 19th-century rural community engendered a social process that illustrates the local business relationships, the political landscape, and craftsman traditions. "The process differed from region to region," says historian Lola Bennett.



portation, intervening on behalf of bridges scheduled for repair or alteration.

The National Society for the Preservation of Covered Bridges, formed in the 1940s, is one of the most active. In its early years, "bridges were disappearing one after another," says David Wright. The pace has slowed dramatically, but there is the new threat of what he calls "demolition through redesign."

Today, the engineer's first impulse is to apply modern materials and technology to a sagging or worn-out bridge. Wright describes "invading a truss," or applying steel gussets and modern fasteners to the original work.

Arnold Graton, Jr., a descendant of New Hampshire bridge builders who performs historically accurate repairs, is the type of craftsman advocates try to bring aboard. According to Graton, engineers often want to increase a covered bridge's load capacity. The preferred technique is to add new piers in the river and run steel stringers from pier to pier to reinforce the deck. This yields what he calls a "romantic structure sitting on steel."

To promote preservation, FHWA has published engineer Phil Pierce's *Covered Bridge Manual,* an exhaustive 340-page guide intended primarily for professionals that addresses loads, structural analysis, connections, and maintenance. It offers an entire section of restoration case studies. Yet its author concedes that some things about covered bridges continue to defy explanation: "How [to] explain the discrepancy between theoretical weakness and observed performance?"

Lowe has chosen to photograph the interior of Blenheim Bridge at night, because of the daylight glare at the entrances. Across the creek, the little town of North Blenheim is quiet, probably not much changed since the bridge's heyday.

Major Hezekiah Dickerman built a tannery on Schoharie Creek in 1850, but the hemlock he needed for tannin was on the other side. So Dickerman hired Nichols Powers, Vermont's best-known bridge builder. The span was built in the village, then disassembled, moved to the creek, and put back together again. It took 127 tons of lumber plus a few tons of hardware. Locals thought it would collapse of its own weight. In its 149 years, it has been flooded, hit by lightning, and set on fire three times.

Lowe gets set to shoot in the darkness. For a frozen moment, his flash lights up an amazing

intersection of verticals and diagonals. And in that split second of light, one can see generations of graffiti carved in the wood.

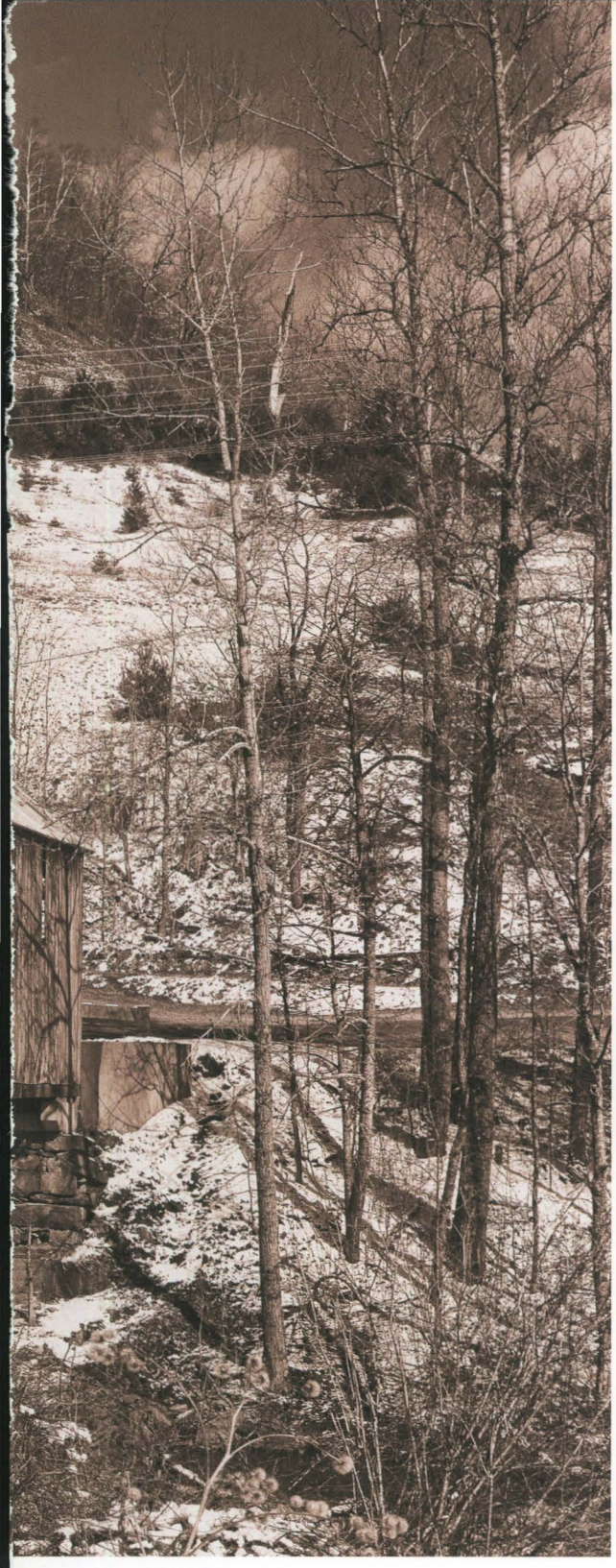
The bridges were often community centers, says Bennett. "At some, they held town meetings, political rallies, and church functions." And they were a good place to post advertisements. Traces of paper in the Blenheim Bridge—still stuck to nail heads—are so old they have the consistency of cigarette ash.

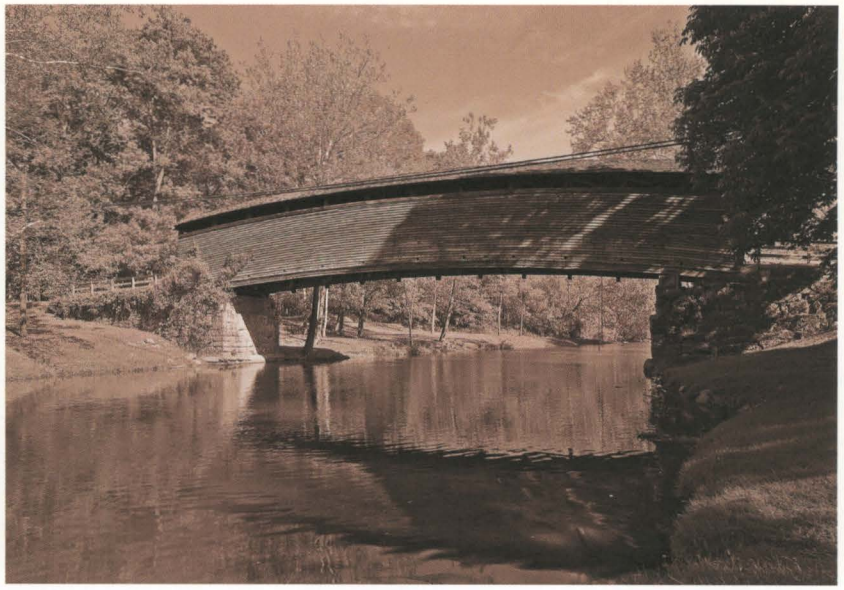
Rethinking the Truss

The crisp drawings that line the walls of the HAER offices look like a designer's concept for a set of retro structures. It's only when one reads "Sunday River Bridge, 1872" or "Taftsville Bridge, 1836" that it becomes clear that one is looking at the past, not the future.

HAER architects spend days at a bridge, producing plans, elevations, details, and perspective drawings. Each architect handles a different aspect of the documentation.

"Some bridges have interesting details, like the joinery and through-bolts," says project leader Christopher Marston, "and we'll try to capture that." The drawings, which include exploded diagrams with numbered parts keyed to descriptive text, are so well rendered that they could be instructions for the ultimate build-it-yourself bridge kit.





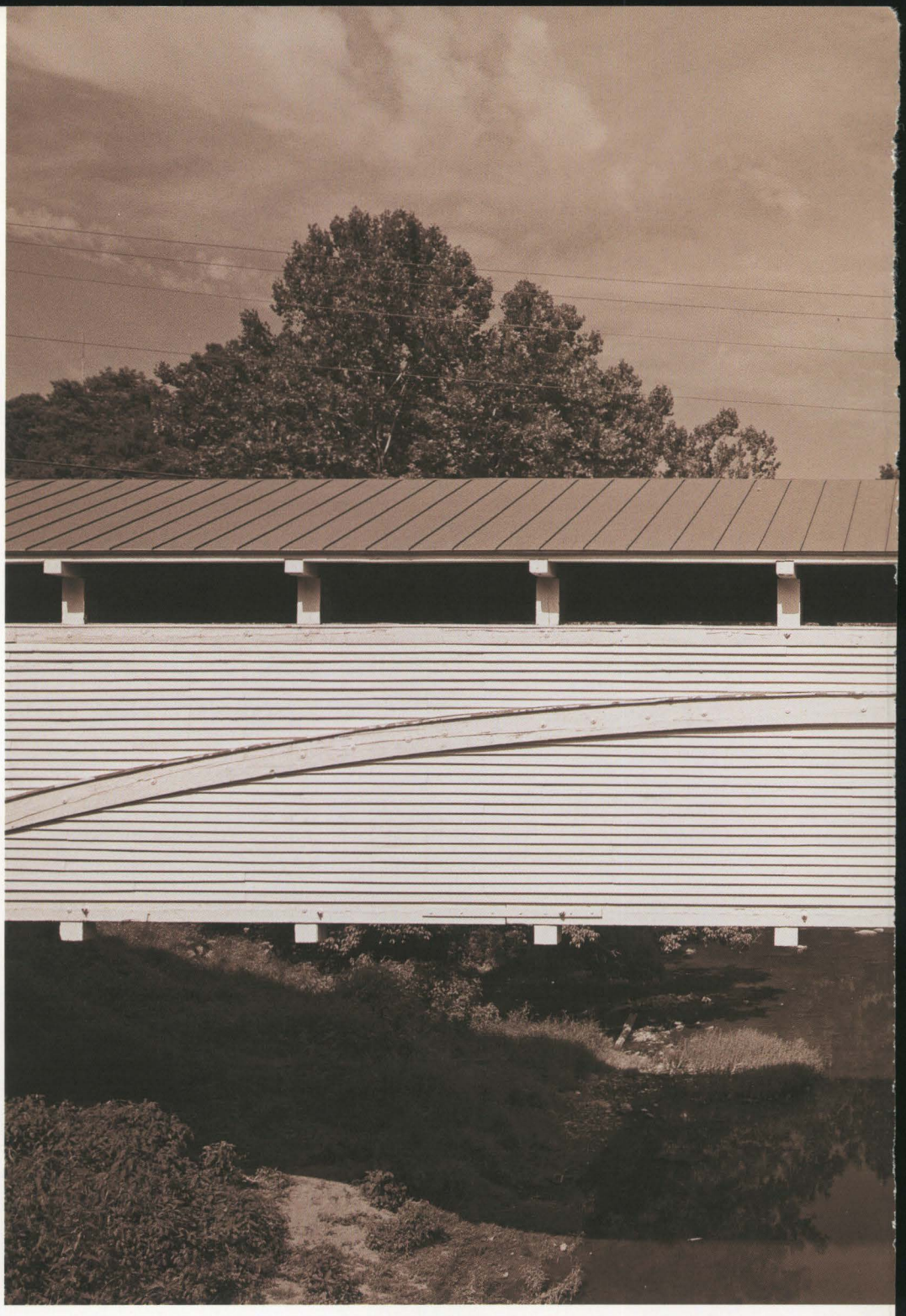
Clockwise from left: *Flint Bridge in rural Vermont; Virginia's Humpback Bridge; Uhlerstown Bridge in Pennsylvania.* *The structures still conceal things about themselves and the world that produced them. "Some of these bridges ask their own questions," says photographer Jet Lowe.*

Bridges on tour

Smithsonian Exhibition Hits the Road in 2006

A covered bridge exhibition, developed by HAER with the Smithsonian Institution Traveling Exhibition Service, starts its road trip in March 2006. For interested venues, time slots are still available at this writing. The core of *Covered Bridges: Spanning the American Landscape* will be photographs and drawings like the ones here. There will also be a section on engineering taken from the analyses performed during the HAER project, with models showing the structural action of beams, arches, and trusses. Actual segments of bridges will be included too, as well as stories unearthed in the research on people and communities. Rounding out the exhibit will be ephemera from the National Museum of American History—advertisements, documents from bridge building companies, and so forth. The exhibit is available to venues nationwide. For more information, contact Shannon Perry, Smithsonian Institution Traveling Exhibition Service, 1100 Jefferson Drive, SW, Suite 3146, Washington, DC 20013-3168, (202) 633-3140, email perrys@si.edu, www.sites.si.edu/exhibitions.

Right: West Virginia's Barrackville Bridge, built in 1853 to cross Buffalo Creek. Below: Honey Run Bridge, Chico, California, saved from demolition by preservationists in the 1960s.



Eric DeLony, retired manager of HAER and one of the project's originators, brought in civil engineers to look at the dynamics of the truss construction. "There were a dozen successful truss forms patented," he says. "And there would be drawings in the patent documents. You really get a sense of what the builders were thinking."

Using this information, the engineers looked at the bridges using modern structural evaluation computer programs. "You can actually load a bridge," says DeLony. "As a hay wagon and horse go across, you see how the components react." He says that such analysis is one of the most cutting-edge aspects of the documentation. Some of this information will be in the exhibit developed with the Smithsonian Institution Traveling Exhibition Service [see sidebar, page 35].

There are other innovative facets, including the first "best practices" conference on covered bridges, convened by the National Park Service Historic Preservation Training Center with the help of the University of Vermont and Historic Windsor, Inc., a nonprofit. An online database—developed by the National Park Service Cultural Resources Geographic Information Systems Office, mainly for the preservation community—will be a way to monitor and update information about the bridges. Users will be able to search by county, name, year built, and length, with drawings, photos, and histories. An interactive mapping component will give detailed geographic information.

Lowe gets set to shoot in the darkness. For a frozen moment, his flash lights up an amazing intersection of verticals and diagonals. And in that split second of light, one can see generations of graffiti carved in the wood.

Saved from Progress

For the most part, covered bridges went out with the 19th century. In Blenheim Bridge's bolts, square nuts, and washers, one can see the approaching dominance of steel.

The old bridge was bypassed in 1932. A concrete and steel span went up about a hundred yards downstream. That bridge, now a crumbling, rusted antique, is being replaced by yet another. As Lowe sets up for a distance shot the following morning, both of Blenheim Bridge's latter-day cousins crowd the picture. Asked if they are in the way, he says, "One of the things that's very important in HAER documentation is context. And this definitely captures context."

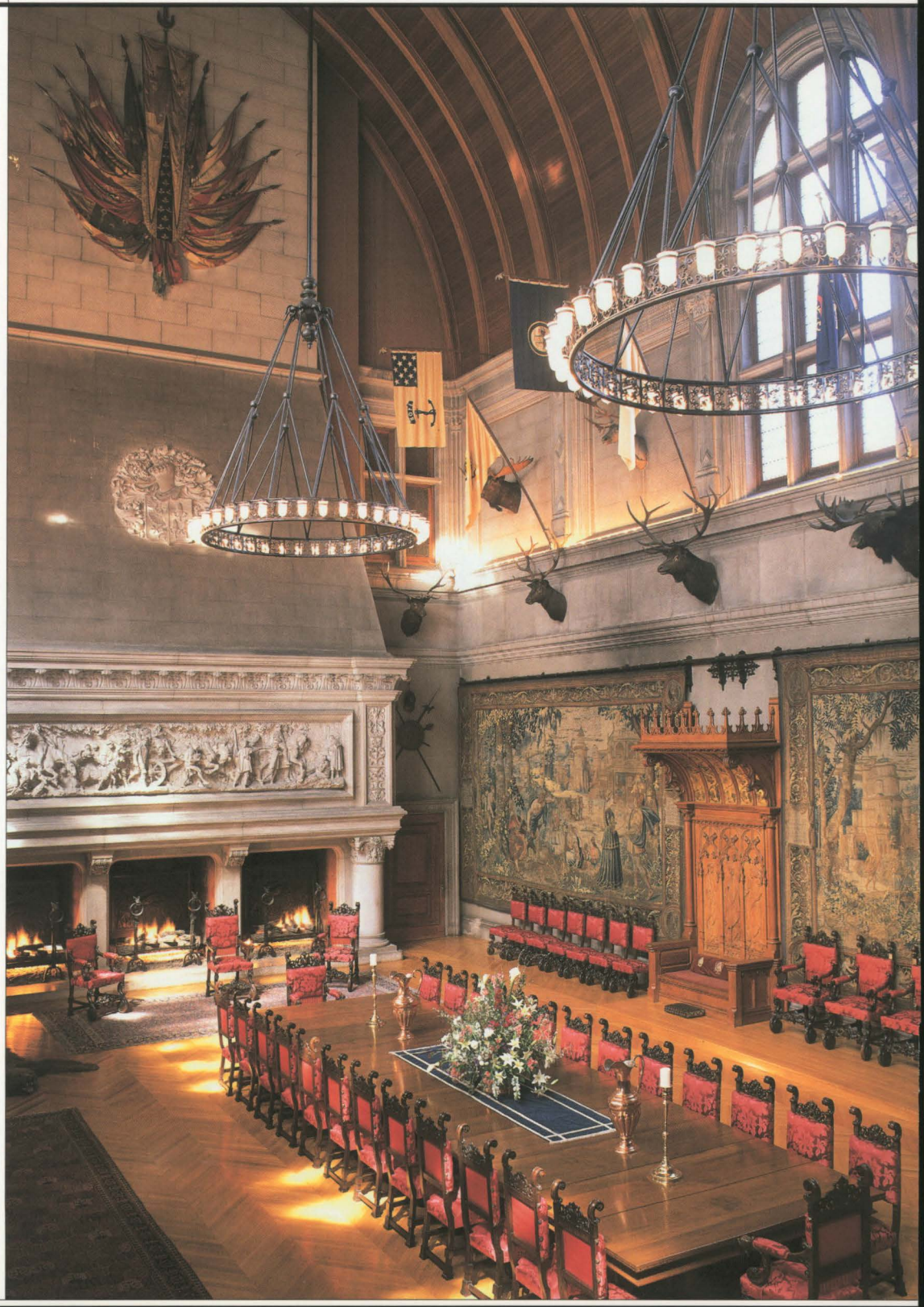
The crew erecting the span shows no curiosity about the photographer or the weathered hulk behind him. Tucked into a bend in the road, with the Catskills rising behind it, Blenheim Bridge looks like part of the landscape. The crew's sense of urgency speaks of a world that has no time for wooden relics. But something in the way the old bridge sits there, the fact that it is there at all, says otherwise.

For more information, contact Christopher Marston, (202) 354-2162, email christopher_marston@nps.gov.

ARTI
FACT

GILDED AGE GRANDEUR

DURING THE GILDED AGE, well-heeled visitors flocked to North Carolina's Blue Ridge, their destination the small town of Asheville, an eclectic and cosmopolitan getaway known for its architecture and views. George W. Vanderbilt was so smitten that he chose the place to erect one of America's most lavish estates, a distinction it retains to this day. **BILTMORE HOUSE AND GARDENS,** completed in 1895, is just one stop on a new travel itinerary developed by the National Register of Historic Places. Part of a series of online guides that highlight historic properties, this latest addition profiles the small town that became known as the "Paris of the South." **CULTURAL ALLURE ASIDE,** the clean mountain air was beneficial to sufferers of consumption and other ailments. When the railroad arrived in 1880, Asheville's popularity increased further still. **VANDERBILT'S ESTATE,** a national historic landmark, is a French Renaissance manor designed by Richard Morris Hunt, with gardens designed by Frederick Law Olmsted. In an era when bathrooms were practically unknown, the Biltmore had 43. **VANDERBILT INTENDED** Biltmore as a country retreat and showcase for his vast art collection, which is still there. With 250 rooms, 65 fireplaces, a vineyard, a conservatory, and other extravagances, Biltmore—its banquet hall shown here—is a remarkable example of the era's prevailing tastes and high-style craftsmanship. **THE ITINERARY** takes visitors on a tour of Asheville's many architectural gems. Go to www.cr.nps.gov/nr/travel/asheville.

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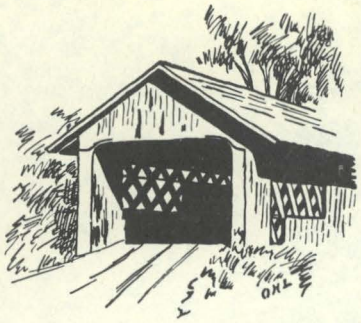


Connecticut River Valley Covered Bridge Society

163 Davis Street
Greenfield, Massachusetts

March 6, 1967

Mr. Richard G. Titus
Supervisor of Historic Sites
7 Langdon Street
Montpelier, VT.

Dear Mr. Titus:

Your letter sent to Mrs. Max Dwyer has been referred to me the president to answer.

Information on the covered bridges in the valley of the Connecticut is rather scanty, the most we have would be rivers or streams they are over, the type of truss, sometimes builders name and the date built, but more often not. I can compile a list of them and send to you with what information I have if you desire. One unusual one is the one at Thetford Center, VT. somewhat recently repaired. It is the only truss of its kind around here, the Haupt Truss.

There are five remaining bridges over the Connecticut River but only four of these spanning it connecting the two states.

Lemington, Vt. to Columbia, N.H., "MT. Orne" between Lunenburg VT. and Lancaster, N.H., "Bedell Bridge" from South Newbury, VT. to Haverhill, N.H., and last "Windsor-Cornish, from Windsor VT. to Cornish, N.H.

On these I have quite a bit of information which is in our magazine The Bulletin. I will be very glad to send you these Bulletins which contain material on them.

Two of them, Bedell and Cornish- Windsor have been in news quite recently. I will enclose one Bulletin that you may see material and judge if you wish others.

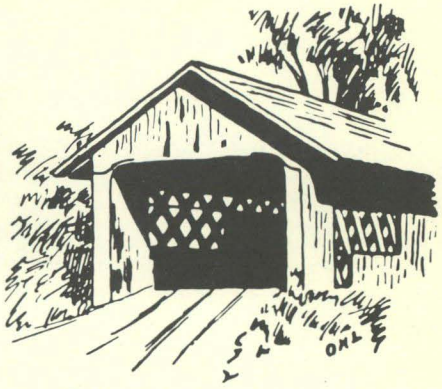
I hope this has been of help to you and if I can be of further help will gladly do so, for as a Society we are much concerned with these old spans.

Sincerely,

Tirzah P. Lincoln,
(Mrs. O.H. P. President.

CONNECTICUT RIVER VALLEY COVERED BRIDGE SOCIETY

BULLETIN



Volume XIII No. 2 Fall 1966

Remove not the ancient landmark which thy fathers have set.

Proverbs 22:28

1866 – 1966

CORNISH-WINDSOR BRIDGE over the Connecticut River between Cornish, N.H., and Windsor, Vermont. Longest covered bridge in the U.S. and still in use after 100 years of service. Dedicated Sept. 25, 1966, by a plaque on portal as an historic site by The Covered Birdge Association of New Hampshire. Act of dedication by Margaret Foster of Windsor, Vermont.

CONNECTICUT RIVER VALLEY COVERED BRIDGE SOCIETY
163 Davis Street Greenfield Mass.

PURPOSE

The purpose of this Society shall be to stimulate interest in the preservation of covered bridges in their original setting wherever it is deemed advisable, and to further this interest in any way possible.

The Connecticut River Valley Covered Bridge Society Bulletin is the official publication of the Society and is published quarterly by the Society.

EDITORIAL STAFF

Editor ..... Mrs. Orrin H. Lincoln
Art Editor ..... Orrin H. Lincoln
Advertising Manager ..... Mrs. Max Dwyer

Membership $2.00 per year; with *Bulletin,* it is $3.00.
Bulletin alone, $1.50 per year; single copies, 50c each.

EDITORIAL

WE ARE DEDICATING tnis issue of our *Bulletin* to two old spans who have reached the century mark this year. The Cornish, N.H., to Windsor, Vt., covered bridge over the Connecticut river, pictured on our cover is one still in use and we hope for many more years.

The other one is also over the Connecticut river, it is retired from service but we hope soon to be repaired and used for foot traffic. The State Parks Division proposes to purchase the century old covered bridge along with about 40 acres of farmland along the river in Haverhill, N.H., for development as New Hampshire's first park designed for boaters and motorists. The bridge, named Bedell Bridge, runs from Haverhill, N.H., to South Newbury, Vt., would be repaired and maintained for its historic interest and if it can be protected from vandalism, it may house exhibits reflecting the history of covered bridges in New Hampshire. We salute you, one for the service you gave and are giving and the other for service which you gave and hope to give in the future.

For the picture of one of the builders of Cornish-Windsor bridge, namely, Bela J. Fletcher, we are indebted to his grandson, Walter B. Fletcher, of Claremont, N.H., whom we had the privilege of meeting. This Mr. Fletcher is also a contractor and builder.

We wish to thank Mrs. Margaret Foster for allowing us to use this history of the bridge which she wrote and which was delivered at the dedication by Prof. Albert Carlson of Hanover, New Hampshire.

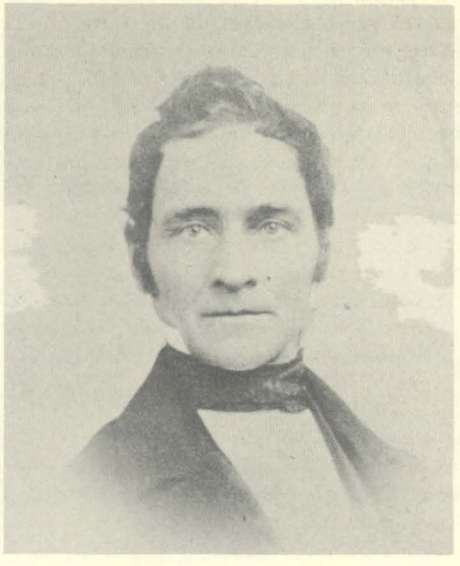
Not all the stories of our old timbered spans as happy ones as these, for you will note in this issue another of our old spans is again the victim of an arsonist. We are having to report these losses altogether too frequently.

In this report there are a few glimmers of hope that "Old Perrine's Bridge" in Ulster County, town of Rosendale, N.Y., may yet be saved. Assemblyman Kenneth L. Wilson of Woodstock said he will make every effort possible to obtain state funds needed to preserve the bridge. Built in 1850, it is the oldest covered bridge in New York State. We have written Assemblyman Wilson as a Society and also as indviduals. We have long urged this bridge be repaired.

T.P.L.

THE CORNISH-WINDSOR BRIDGE

MARGARET FOSTER, Windsor, Vermont



BELA J. FLETCHER
One of builders

THE PRESENT Cornish-Windsor Bridge is the fourth one on this spot. The first was opened to the public in October 1796, and lasted until spring 1824. A new bridge was promptly built. It too, was lost in a spring freshet, this time in 1849.

The third bridge, the first to be covered, was built the same year. It went as the others had — in a flood. This was in March of 1866. These three bridges were lower than the present one, as can be seen by the central pier. Had the present one been this lower height, it would have gone out in the flood of 1937 when there were several inches of water over the bridge floor.

On April 3, 1866, the contract for the present bridge was signed. James F. Tasker of Cornish and Bela J. Fletcher of Claremont signed as builders. It is usually believed that Tasker, who could neither read nor write, actually built the structure. Allen Wardner, Alfred Hall and Henry Wardner represented the bridge company proprietors.

The bridge was framed in a meadow north of Bridge Street in Windsor. It is a Town Lattice truss and is made of timber. Late in 1866 the bridge was opened to the public — probably the last of October or the first of November.

Repairs have been made at numerous times, the last being 1954-55. At that time it was necessary to drive ten miles to get across the river. Many workmen who lived in New Hampshire left their cars on that side of the river and walked across the bridge to work.

Most of the early spans were toll bridges and this was no exception. It is easy to wonder how a bridge paid off before the days of automobiles. It was produce and livestock headed for the Boston market, plus stage coaches, that made the bridge a paying investment. In 1838, before the railroad was built, 14,084 sheep and 2,208 cattle crossed the bridge on their way to market. At this time four stage coaches were crossing the river each day.

President Wilson had his summer White House in Cornish during 1914 and 1915 and used this bridge. Other Presidents who are reputed to have crossed here are Hayes, Monroe and Theodore Roosevelt. In 1825 Lafayette came into Vermont over this span.

A "holding company" owned the bridge until 1935, when the New Hampshire Legislature gave permission to the State Highway Department to buy it. The plan was to collect tolls for another ten years. However, in the early 1940's gasoline became scarce and travel was at a minimum. Tolls collected did not amount to as much as the cost of hiring a gate keeper. Since the bridge had already paid for itself, it was decided to make it free. This was done June 1, 1943, with much fanfare.

The gate, which was removed when the bridge was freed, was a distinguishing feature. It was controlled by a rope from the toll house porch. A pull of the rope lowered the gate and held up traffic until the proper cash had changed hands. It was customary to lower the gate at 10 p.m., at which time all respectable people were supposed to be at home. If anyone wanted to cross after that hour, he had to wake up the toll collector and settle with him. In later years the gate was not down at night. It was considered better to lose the 15 cents than to disturb the keeper's rest.

At one time Windsor was "dry," but there was a good tavern just across the bridge. The toll collector had quite a bit of leeway as to what he charged. At this time he set the price for pedestrians at two cents for leaving Windsor and three cents for returning — both to be paid as the person left for the tavern.

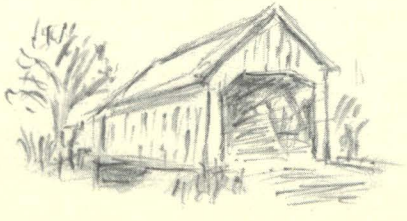
There are many stories about this span, as there are about all covered bridges. One story says that at one time a woman tried to run the bridge and not pay toll, which she considered exorbitant. James Montieth, the toll collector, took time out from his knitting to pull the rope. The gate came down between the horse and the buggy and the horse kicked it nearly to pieces. The woman had to pay her toll and the damages. Mr. Montieth never dropped a stitch of his knitting!

A prominent citizen of Windsor says he lost his first job because of the bridge. He was driving for a laundry and had one more delivery to make — across the river. There was a dance that night that the young man wanted to attend. As soon as the gatekeeper gave him the nod, he larruped up his horse and ran the bridge. The gatekeeper called the laundry and fined them $2.00. When the young man got back he was fired.

At one time a man who lived in New Hampshire had a good riding horse. He galloped onto the bridge. The keeper dashed out and dropped the gate. This did not deter the horse in the least. When he came to the gate he jumped over it and raced up the street.

A woman refused to pay her toll, claiming there had been no rate set for automobiles when the franchise was granted. There had been a similar case in New York and the motorist won. A case had been tried in Vermont and the decision, based on the New York case, was again for the motorist. But this case was tried in New Hampshire and the woman lost. However, proper steps were taken to legalize fees for cars.

Some people wish the bridge were gone and a new, modern one in its place. Others, more sentimental, would like to see it kept. It could be blocked to traffic and become merely a tourist attraction. Besides being the longest covered span in the United States, it is very photogenic. Let's keep it for another hundred years.



BRIDGEWATER CORNERS BRIDGE
Michael C. DeVito collection

THE PASSING OF THE COVERED BRIDGE

Written in commemoration of the Vermont Flood of November 3-4, 1927, *and the covered bridge at Bridgewater Corners on the road to Plymouth, Vermont.*

FAREWELL! Thou Covered Bridge of state,
Must thou now go to thy sad fate?
Perhaps thy mission is fulfilled
And now they creakings will be stilled.

A noble service thou hast giv'n,
As o'er thy planks have many driv'n.
Within thy portals I did woo,
And there betroth my sweetheart, too.

And other romance thou hast known,
And courtings ever didst condone,
Thy courts secluded in the dark;
Secluded more than Village park.

If thou must go — so let it be! —
Thy footings are a memory;
A monument to thy good name;
A testimony to thy fame.

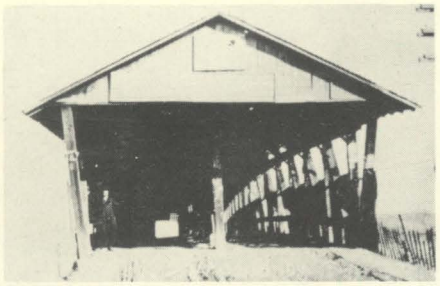
O, Bridge! come back! Must thou now go?
I see ahead a greater woe,
Thy splintered sides and twisted beams
May soon attest to angry streams.

Calamities may then befall,
And one sad end may come to all.
Disaster, destiny and death
May all result in one short breath.

If thou must go, O Bridge! Sail on!
Perhaps to days of halcyon.
Who knows thy future? What 'twill be?
But just to sail on some blue sea.

Send back a message, Bridge; O, send
An epic to thy tragic end!
That we may write thy history
And hand it to posterity.

EUGENE N. DAVIS



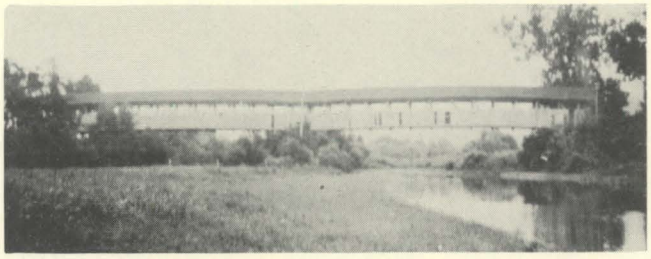
RECENTLY a volume entitled *Historical Collections of Coshocton County* by William E. Hunt (Robert Clarke and Co., Cincinnati, 1876) was found in the College of Wooster library quite unexpectedly. Most unusual for a county history, it contained a fairly complete section on the major bridges in Coshocton County, some only a few years old. Though this sort of material is history now, it strikes one as unusual that it was written into a history when it was hardly older than yesterday's newspaper. In any case we appreciate it.

Coshocton County, Ohio is traversed by two major rivers, the Walhonding and the Tuscarawas, which join at Coshocton to create the Muskingum River. Besides these waterways, Killbuck Creek and Wills Creek are of considerable size, not to mention the importance of two canals, the Walhonding and the Erie and Ohio, which used to carry freight and travelers through the county. Wherever there are big rivers, there is a rich covered bridge history. Thus far untapped, Coshocton County lures the historian to do further research into her past and present covered bridges.

The following article is a complete quotation from the above mentioned book, together with comments and facts not included in the text, and some information on the builders:

"A TOLL BRIDGE was built for the county over Killbuck in 1818 by Adam Johnson at a cost of $495. Thomas Johnson and others, authorized by the legislature, built one over Wills Creek. After many years this was turned over to the county, on condition that it should be repaired and kept up. A bridge was built over the Tuscarawas at Coshocton in 1832 by Elisha Gibbs, Robert Hay, and William K. Johnson, under the supervision of James Renfrew, Samuel Lee, and Benjamin Ricketts, who were designated for the purpose by the county commissioners, and especially represented the citizens, who made donations (amounting to $1200) for the building of this bridge in order to have it a free bridge. It was carried away in a freshet about a year after it was finished. (Footnote: 'Sals Gut,' a bayou near the Tuscarawas Bridge troubled the settlers a great deal, but it was at length filled in.)

"In 1836 a contract for the present bridge over the Tuscarawas, and also the one over the Walhonding at Roscoe was made with William Renfrew, James Hay, Thomas Johnson, and Robert Hay. [Roscoe is a town at the northwestern corner of Coshocton across the Walhonding.] The Tuscarawas Bridge was finished in 1837, and the other the following year. The contractors received for both bridges $19,000. That was a large sum for a county expenditure in those days and there was some difficulty in obtaining it. Sealed proposals for the loan were invited, without response. General Burns was sent by the commissioners to Baltimore to get the money, but failed. Ten thousand dollars of it were at length obtained through the Bowmans of Brownesville, Pa., legal custodians for some parties in Columbiana County, Ohio, and the other ten thousand from the 'Ohio Life and Trust Company.' For the first ten years the county was to pay only the interest and the second ten the interest and $2,000 per year of the principal.



Portal and side view of bridge over bayou of Tuscarawas River, west of Newcomerstown. *Photos: Ann Zimmer*

"The next considerable bridge erected was a wooden one at Walhonding about 1854. It got out of shape and was regarded by many as insecure and was rebuilt in 1860. Again giving way, it was superseded by an iron bridge in 1872. Some of the material in the old bridge was used in the masonry of the new. A mistake in dimensions was made, increasing the expense of the masonry, which (almost wholely by labor) cost some $1,200. The masons were Bachman Brothers and N. W. Buxton. The superstructure was furnished by the Coshocton Iron and Steel Works, and cost $7,844. The ice in the winter of 1874 carried away a pier and two spans of this bridge. The latter were replaced by the Cincinnati Bridge Co. (of which for a time the Coshocton Iron and Steel Works was a partner) in 1875.

"The next bridge built was the Meskimens bridge on the upper Tuscarawas about 1854 costing some $10,000. [Meskimens bridge was on present S.R. 16 just west of the Coshocton and Tuscarawas County lines. By the cost, it may be inferred that the bridge was double track.] This also was disturbed and somewhat rebuilt. The river having in 1861 cut a new channel necessitated a new bridge a few hundred yards east of this one, the cost of which was about $9,000."

Pictured is the double track bridge over a bayou of the Tuscarawas. After the bridge burned down about 1910, the channel was filled in. Those who have seen the Doughty Creek bridge will notice similiarities in construction, especially the truss timbers, the portal, and the marked camber.

Alliance Review (Ohio) Dec. 8, 1884: "Newcomerstown—A ROTTEN BRIDGE GIVES WAY—A frightful accident occurred at this place this afternoon, which resulted in the instant death of Mr. Dent Murphy and Jesse Pratt, both well known citizens of this place. They were in town this forenoon having some repairs made upon a self-propelling steam engine. They started home about noon. While crossing the bridge known as Meskimens about two miles west of town, a section of the floor gave way under the engine when they were near the middle pier. Young Murphy's father was just behind the engine and saw it go down with his son and young Pratt. He stood by until he saw the fire in the engine extinguished, and seeing neither his son nor Pratt, rushed to town frantic with grief and crying for help. When he reached town he walked round and round in a circle leading his horse, and it was sometime before he could collect his senses and tell what was the matter. Pratt's body was found about two hours after the accident, and his neck was broken. Murphy has not yet been found. Young Pratt had just been married last night, and Murphy leaves a wife and family."

"In 1868-69 the Warsaw and Fry's Ford bridges (wooden) were built. John Shrake of Newark was contractor for masonry on both. The superstructure of the former was contracted by B. and J. Haggerty and of the latter by John Hesket. The masonry of the Warsaw Bridge cost $6,765; of the Fry's Ford, $6,709. The superstructure of the former cost $8,893, and of the latter, $6,100."

Fry's Ford was in Bethlehem Twp. about 1½ miles east of Warsaw. Of the above builders nothing is known yet except that John Shrake also built superstructures of bridges as well as foundations in Tuscarawas County, Ohio. The Haggertys were also quite active in Tuscarawas County.

The Orange Bridge was built in 1870; the masonry — N. W. Buxton contractor — cost $8,311; the superstructure (iron) J. W. Davenport, contractor, cost $7,258.

An iron bridge was built over the Mohican a little above Walhonding in 1871. N. W. Buxton constructed the piers and abutments for $4,465 and the Massillion Iron Bridge Company furnished the superstructure for $5,070.

The Lafayette Bridge (iron) was built in 1873; stonework by N. W. Buxton cost $6,290; superstructure by Cincinnati Bridge Company (J. W. Shipman and Co. of Cincinnati and Coshocton iron and Steel Works) cost $8,746.

"The commissioners are proposing to mark the centennial year by building a bridge near Morris Ford (2 miles below Coshocton) and another at Robinson's Ford (7 miles below Coshocton) over the Muskingum River. The masonry of the upper one has been let to S. H. Moore of Tuscarawas Twp. and of the lower one to Perry Collins of Knox County. The superstructures of both are to be furnished by the Smith Bridge Company of Toledo, Ohio. They will be 16 feet wide (wooden) and cost together some $21,000."

The Robinson's Ford bridge was at Conesville and became the longest covered bridge in the state for many years, being 400 feet in two spans. On August 13, 1958, the county destroyed it, pouring 150 gallons of gasoline on it and setting it afire.

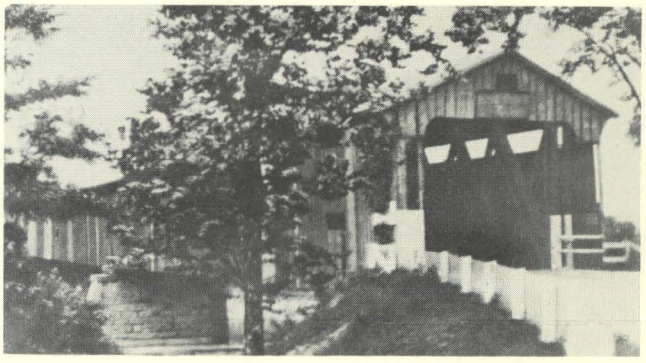
In the same book we find some information on some of the builders mentioned. The following are condensations of biographies of three builders only one of which did any real building.

Thomas Johnson, who was born in the parish of Glentubert, Monaghan County, Ireland, on March 16, 1783, left Ireland and came to America in 1806. Financially desperate when he landed, he had but one sovereign in his pocket. In 1808 his family joined him in Newark, New Jersey, and he married Sarah Parker. In 1808 he came to East Plainfield in Coshocton County, served in the War of 1812 under General Harrison, and held offices of Justice of the Peace and Assoc. Judge of the Court of Common Pleas. He and Jacob Waggoner built the first mill of note on Wills Creek, with 4 run of burrs. During the years 1820-30 he ran flat boats to New Orleans, nearly losing his life in the first cholera season. "In running the dam at Zanesville one time he and two of his oarsmen were thrown out of the boat by the oars striking the piers of the bridge. Mr. Rankin, being a good swimmer, got out; Wm. Smith was drowned and he was rescued from the water by the exertions of Sheriff Daniel Brush." Once Johnson went up the Tennessee River as far as Florence. He also ran large contracts on the Ohio and Erie Canal.

Since the high banks and the mud bottom of Wills Creek made fording it difficult, especially at his mill, and the commissioners unwilling to build a bridge there, he petitioned the Ohio Legislature in 1834 to authorize him to build a bridge and collect toll. This was the first bridge on Wills Creek and was a toll bridge for nearly 20 years, when his son offered it to the commissioners if they would repair and maintain it. He was connected with building the bridges over the Walhonding and Tuscarawas between Coshocton and Roscoe. During 1838-40 he ran heavy contracts on the Walholding Canal. In 1835 he built the largest meeting house in the area, free, for a certain Methodist minister. After a long illness, he died August 20, 1840.

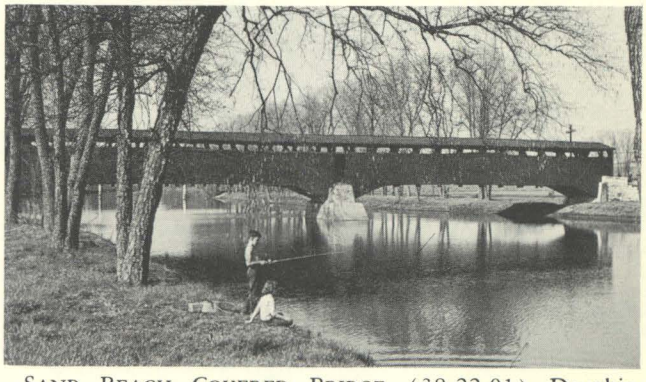
Wm. K. Johnson and Robert Hay, connected with the bridges at Coshocton, were both born in Ireland in the early 1800's and came to Coshocton County in 1817. They were both hard-working, respected businessmen. Both died in the 1860's.

Credits: *Making copy of two-lane bridge, Del Axe*
Finding the above newspaper article, Hallie Jones



Over the Walhonding River at Coshocton, Ohio, obviously built after the article written for this is a Smith Truss.
Courtesy Mrs. Chester Thomas

ANOTHER OLD SPAN GONE



SAND BEACH COVERED BRIDGE (38-22-01) Dauphin County, Pa., near Hershey, over Swatara Creek, 2 span, built around 1853, Burr truss was burned on September 3, 1966. The bridge had been repaired in the last few years at a great expense, and painted red.

All that was left was a charred mass as seen in this photo sent by Mr. Walter W. Pryse. Because of its condition the bridge was removed. Thus another of our fine old spans becomes the victim of an arsonist. Removal of bridge reported by the Sitler family of Hershey, Pa.

OREGON'S OLDEST COVERED SPAN SPARED BY PRAYER

By IMOGENE WALLACE MCCOY
Ashland, Oregon

LOST CREEK COVERED BRIDGE
Jackson County, Oregon

THE COVERED BRIDGE over Lost Creek in southwest Oregon holds a special place in the hearts of admiring friends who come from near and far to admire a dainty queen post span, noting how gracefully it is tucked into the landscape—rugged, scenic mountains, fertile valleys, comfortable homes, and sprawling cattle ranches. Located in the Lakecreek area of Jackson County, the Lost Creek Covered Bridge is east and slightly north of Medford, the county seat and a very busy city of 30,000.

Only forty feet in length, the bridge is the shortest span in our county. According to several reliable sources, the bridge was built around 1874, establishing credibility to being called Oregon's oldest covered span. Although wooden covered bridges belong to an era of the past — to the rural countryside and the days of the horse and buggy — the Lost Creek Bridge still serves its purpose. Once a vital, busy thoroughfare leading to popular fishing and camping resorts at Dead Indian Soda Springs and Fish Lake, new highways and shorter routes beckon hurrying citizenry. But for those who prefer the leisurely excursion, and thus enjoying the scenery along the way to their destination, the bridge and road are in excellent condition through county maintenance.

For more than fifty years, John and Marie Walch have made their home within a stone's throw of the bridge. "The bridge looks just as it did when we set up housekeeping here after our marriage on December 9, 1915," remarked Mrs. Walch as she recalled childhood days when she crossed it to attend country school. They are both life-long residents of the Lakecreek area.

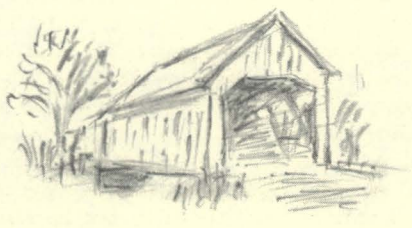
Lost Creek is a small stream that receives water from many tributaries that tumble down the steep mountain sides and from Lost Lake, a very beautiful and highly elusive lake that lies at the bottom of a long, narrow and deep canyon whose walls rise one thousand feet high in some places. The lake is approximately four times longer than it is wide. Lost Lake is only a small lake — probably a nine acre tract would fit into it, provided it were the correct shape. In searching for Lost Lake many people become confused and follow other streams and canyons until exhausted and are forced to forsake the real object of their journey. Thus Lost Lake is an appropriate name. A state forestry official advises that the best way to see the little jewel is to accompany him on one of his airplane tours of this region.

Lost Creek is well named, for it too is very elusive, dropping one thousand feet within two miles, it disappears beneath the lava rock, flows underground and is lost for some time. At the bridge, it is sparkling and crystal clear. By a winding trail, the distance from the bridge to Lost Lake is estimated to be eight miles.

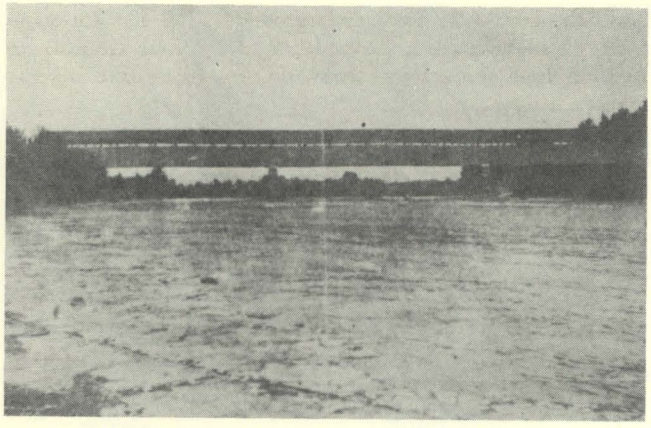
Oregon's covered bridges suffered greatly during severe storms and floods of December 1964, and the bridge over Lost Creek seemed doomed as madly swirling waters and great quantities of heavy debris lashed and pounded the piers. Darkness settled over the valley very quickly on that evening in December and the rains became more torrential. Marie Walch and her daughter, Shirley, chose to spend the night in one of the nearby barns. Undaunted, John Walch took a load of hay across the bridge and fed his hungry, restless cattle. When the evening chores were completed, he stayed alone in the house and maintained a constant vigil of prayer to save the bridge. Suddenly a ray of hope appeared, the sky became lighter, the clouds scattered, and the rain stopped almost at once. The logs that had pounded the piers began to move downstream, and John Walch believes to this day that he witnessed a modern miracle. "Saved by prayer, that old bridge," testified John Walch as we visited their home and admired the Black Angus and Scottish Galloway cattle "grazing contentedly on pasture lands that a 1500 acre ranch provides."

Yes, "saved by prayer" and faith, this lovely, captivating bit of Americana, nestling in the heart of southern Oregon's majestic moutains, although part of "an era . . . past," still provides treasure to present and future generations. May the Lost Creek Covered Bridge continue to receive the measure of treasure that provides by guarding it from harm, from fire, flood, and the work of vandals.

LOST CREEK COVERED BRIDGE



THE COVERED BRIDGES IN NORTHWESTERN CATTARAUGUS COUNTY



VERSAILLES, OVER CATTARAUGUS CREEK
Erie County, New York

Conclusion

ANOTHER covered bridge was at Versailles which was not taken down until 1896 or 1897. This was of three spans, each about 100 feet long. There is no information readily available now as to when it was built but probably in 1860 or 1870 There was a first bridge that went across directly at the foot of Main Street in Versailles and to do so must have been at quite a sharp pitch as the bank on the east side is at least 50 feet high. There is one rumor that this was a covered bridge and was more than likely of "needle beam" construction. The creek at this point is narrow enough to have done this, but doubtless due to this steep grade the decision to build a longer one downstream was made. Only the name of the builder of the covered bridge is known, Ransom Ward, but not the date. From the ages of his children who have all or nearly all passed away we can figure the possible date of building the bridge as before stated.

Allan Parker, the father of the present Dr. Allan Parker, had the contract of filling the approaches to the steel bridge which replaced the covered one. The new bridge being several feet higher than the wooden one. This being on the Reservation and a Federal project there is no town record to go by.

Here again I had a personal contact with this covered bridge because on occasion I used to walk out to one of its piers, crawl through a hole in the board side down onto a pier and fish from the Creek. Seldom caught any fish.

An episode in connection with this present bridge is that it cost $16,000 and was universally branded as as a steal and robbery. Try and build one today for twenty times that price.

We may as well pause here and tell what a "needle beam" bridge was. The chords or long timbers were notched at the ends and into these was erected an A-frame with bolts from the top of the A down supporting a crossbeam under the chords. This was the "needle beam." It was used by the geometric principle that you cannot change the shape of a triangle without changing the length of its sides.

Working almost entirely from tradition there may have been another covered bridge in Zoar at Hill's Tavern. This was not too far from Erie County side. The creek has changed the land so much that it is now impossible to locate the spot. We know that on the flat land across from the tavern were held the "General Trainings" of the 1840's. Also from tradition is the persistant belief that at a period of high water a man, wife and little girl were ready to cross when Landlord Hill told him it was impossible, but he stubbornly rejected the advice and started across, the wagon was overturned, the little girl swept away and her body was never found.

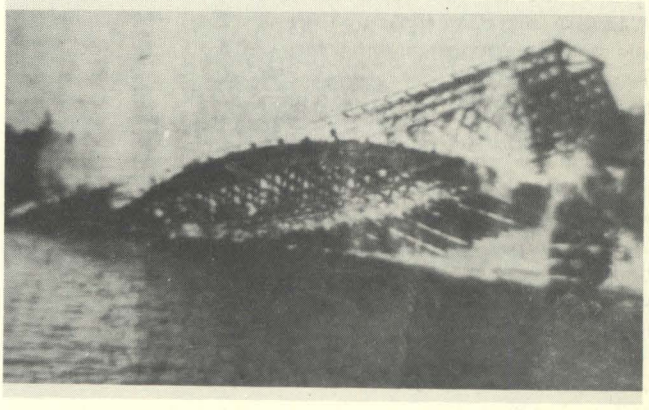
Samuel Hill evidently later built a bridge which must have been a covered one for in the night a traveler entered one end and the bridge which making a "whispering gallery" from about the middle heard the words, "when he gets here grab him."

The only sure thing about this is that Hill's Tavern was there, that "General Trainings" were held across the creek and that there must have been a bridge. Theophilus Hill, living in North Otto on land once owned by Samuel Hill; his great, great grandfather says that he knows there was a bridge built by Samuel Hill but does not know if it was covered one.

There may have been other covered bridges across the Cattaruagus for there were and are ones at "Tallman's" lower end of the Zoar, next, above and east of Frey Hill, Scobie, southwest of Springville, the name of which I have never been able to learn. "Hakes" bridge about two miles into Sardinia Valley and probably one at "The Forks" near Sardinia. It remains for some other historian to find out.

Respectfully submitted,
EBER L. RUSSELL, Perrysburg, N.Y.

KELLEY'S FALLS COVERED RAILROAD BRIDGE
MANCHESTER, N. H.



ONE OF THE most spectacular fires seen in this city in recent years destroyed the 50-year-old wooden railroad bridge across the Piscataquog river at the Kelley's Falls late Monday afternoon, completely disrupting traffic on the North Weare Branch of the Boston & Maine Railroad.

Fanned by unusually high winds the flames quickly swept through the dry and aged structure causing the support to buckle and dump the flaming hulk into the river below. No estimate of damage was available last night.

Flying embers kept Manchester firefighters busy on several fronts for several hours as nearly a half dozen brush fires were started and in one instance a residential dwelling was ignited at 56 Messier Avenue, but the blaze was quickly extinguished with but slight damage.

Thousands of spectators watched the bridge fire from "Grandstand" seats atop the Kelly's Falls highway bridge but were driven to cover from time to time as shifting winds sent sparks and embers flying in their direction.

Although fire and railroad officials were still attempting to determine definitely the origin of the fire, it was reported that several boys believed to have been swimming in the river earlier were seen crossing the wooden bridge just before the fire was discovered. It was discovered by Wilfred Francois, a railroad section man, who was staying at a nearby camp on his day off.

A still alarm was sent into fire headquarters at 4:40 P.M. and three minutes later Deputy Arthur J. Provost, upon arriving at the scene, ordered box 339 at the corner of Kelley and Morgan pulled. Two calls for additional apparatus were required later in the afternoon as fires broke out in the nearby woods and on a hill at the southeastern end of the bridge. Firemen were at the scene until after 8 o'clock wetting down the approaches to the bridge and the burned over tracks of brush and woodlands.

The heat was so intense during the height of the blaze that it was reported to have melted the rails crossing the bridge and forced firemen to back away from the flames several times. Firemen were aided in quelling some of the small woods fires by boys and other volunteers who were constantly in danger because of flying embers. Two men narrowly escaped injury as they risked swimming in the river during the fire, heading for shore just before the bridge crumpled into the river.

An out-of-state motorist driving eastward on Kelley Street, far from the scene of the fire, was startled to discover that a mattress and some pillows which he had tied on the roof of his machine had caught fire and were issuing forth clouds of smoke as he traveled along the street. Pedestrians notified him of the fire, which apparently was started when the embers from the bridge fire were dropped on the car.

Yesterday's fire marked the second time in five years that the rail service on this branch had been disrupted by disaster. The railroad bridge across the Merrimack River serving the same branch was swept out in the flood of 1936.

An official of the Boston and Maine Railroad declared last night that engineers of the railroad will inspect the damage this morning and report back to headquarters on the advisability of rebuilding the bridge.

Meanwhile freight to Goffstown and New Boston will be placed on the public delivery track at the Manchester yard and will have to be trucked to those towns until such time as service is resumed. It was explained that three trips a week made to those towns over the North Weare Branch.

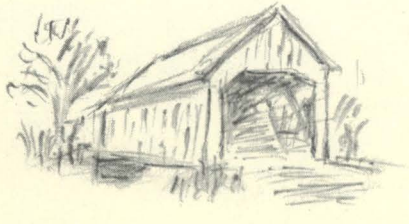
It was pointed out by firemen that the heavy rain on Sunday night aided materially in preventing the brush fires from getting out of hand.

Apparatus called to the scene included Engines 2, 6, 8 and II, Ladder 6 and 8. Chief Charles H. French was at the scene directing firefighting activities.

The preceeding page and the above information was copied from Manchester paper of September 2, 1941.

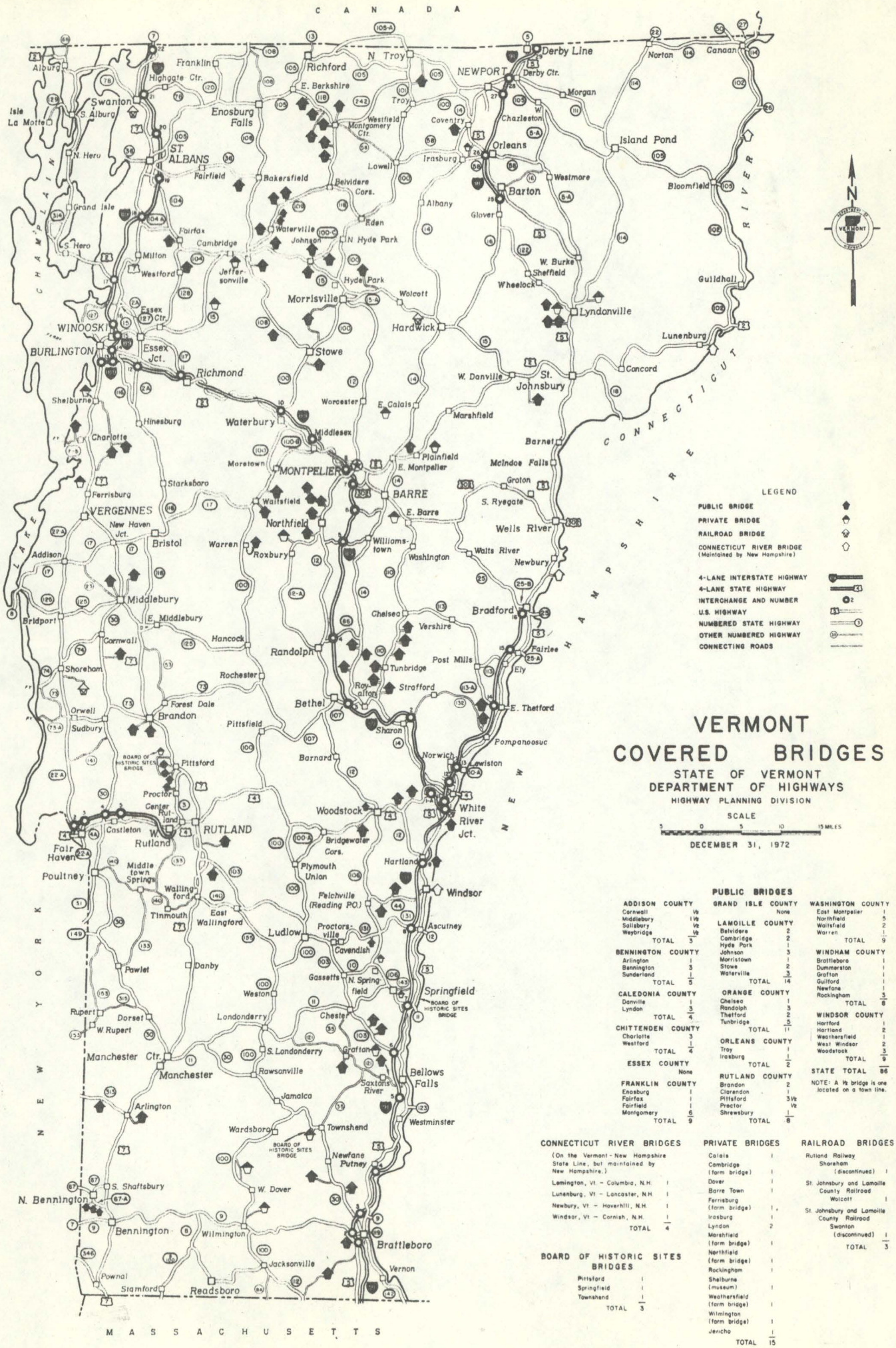
The records at the fire station state that the still alarm was sent in at 3:40 P.M. and not 4:40 as in the newspaper, and that the damage was $6,000. Records show that Engines 2 and II and Ladder 6 were at the scene.

Material furnished by Richard Roy of Manchester



1866 – 1966

YES, I'M 100 years old this year and I span the Connecticut River between the towns of Haverhill, N.H., and South Newbury, Vermont. My name is "Bedell Bridge," 2 spans, Burr truss with laminated arches. Photo by O.H.L., 1953, when I was still in use. See editorial for further information.



VERMONT COVERED BRIDGES

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
HIGHWAY PLANNING DIVISION

SCALE
5 0 5 10 15 MILES

DECEMBER 31, 1972

PUBLIC BRIDGES

ADDISON COUNTY	
Cornwall	½
Middlebury	1½
Salisbury	½
Weybridge	½
TOTAL	3

BENNINGTON COUNTY	
Arlington	1
Bennington	3
Sunderland	1
TOTAL	5

CALEDONIA COUNTY	
Danville	1
Lyndon	3
TOTAL	4

CHITTENDEN COUNTY	
Charlotte	3
Westford	1
TOTAL	4

ESSEX COUNTY
None

FRANKLIN COUNTY	
Enosburg	1
Fairfax	1
Fairfield	1
Montgomery	6
TOTAL	9

GRAND ISLE COUNTY
None

LAMOILLE COUNTY	
Belvidere	2
Cambridge	2
Hyde Park	1
Johnson	3
Morristown	1
Stowe	2
Waterville	½
TOTAL	14

ORANGE COUNTY	
Chelsea	1
Randolph	3
Thetford	2
Tunbridge	½
TOTAL	11

ORLEANS COUNTY	
Troy	1
Irasburg	½
TOTAL	1½

RUTLAND COUNTY	
Brandon	2
Clarendon	1
Pittsford	3½
Proctor	½
Shrewsbury	1
TOTAL	8

WASHINGTON COUNTY	
East Montpelier	1
Northfield	5
Waitsfield	2
Warren	1
TOTAL	9

WINDHAM COUNTY	
Brattleboro	1
Dummerston	1
Grafton	1
Guilford	1
Newfane	1
Rockingham	3
TOTAL	8

WINDSOR COUNTY	
Hartford	1
Hartland	2
Weathersfield	1
West Windsor	2
Woodstock	3
TOTAL	9

STATE TOTAL	86

NOTE: A ½ bridge is one located on a town line.

CONNECTICUT RIVER BRIDGES

(On the Vermont - New Hampshire State Line, but maintained by New Hampshire.)

Lemington, Vt. - Columbia, N.H.	1
Lunenburg, Vt. - Lancaster, N.H.	1
Newbury, Vt. - Haverhill, N.H.	1
Windsor, Vt. - Cornish, N.H.	1
TOTAL	4

BOARD OF HISTORIC SITES BRIDGES

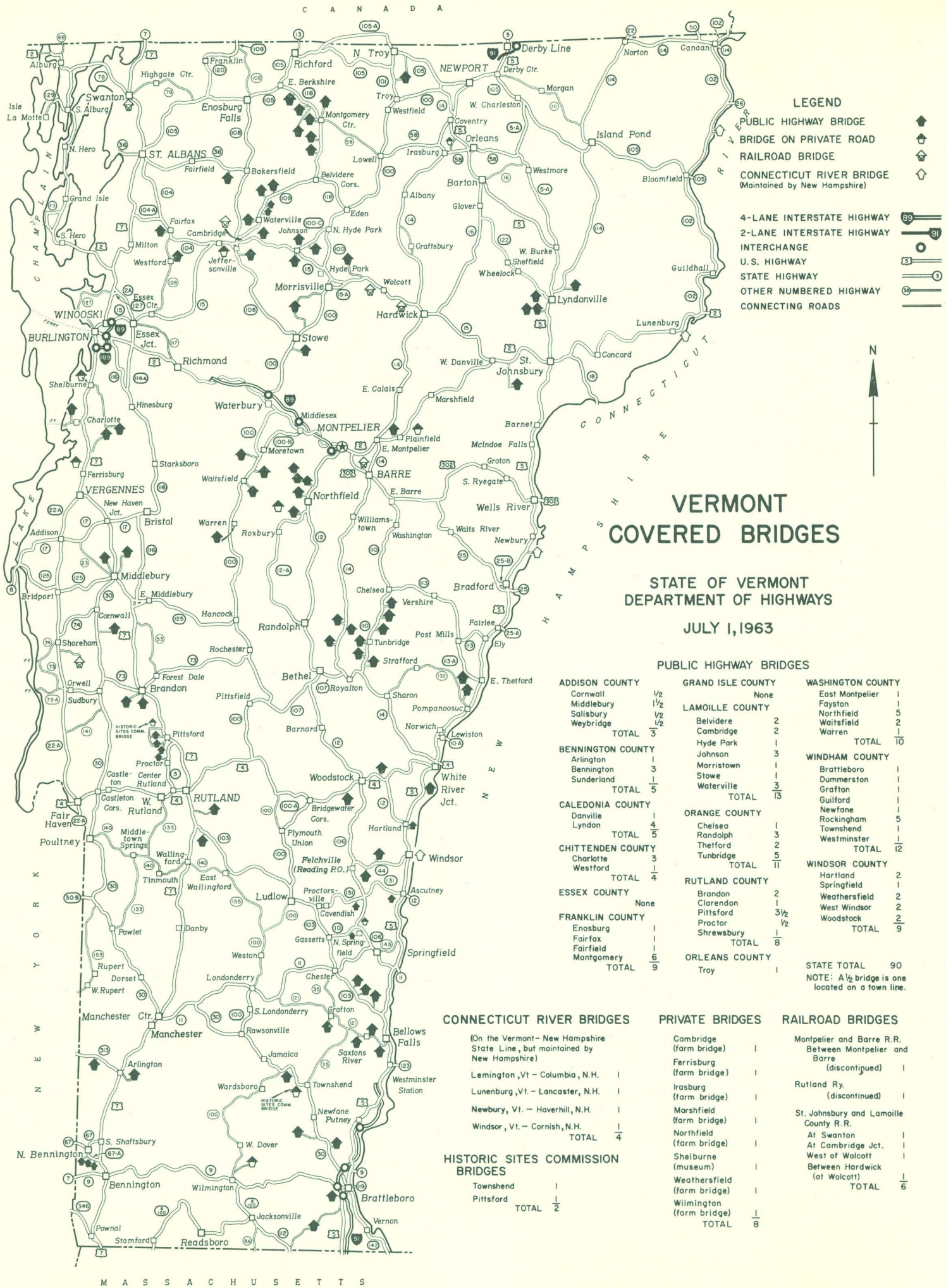
Pittsford	1
Springfield	1
Townshend	1
TOTAL	3

PRIVATE BRIDGES

Calais	1
Cambridge (farm bridge)	1
Dover	1
Barre Town	1
Ferrisburg (farm bridge)	1
Irasburg	1
Lyndon	2
Marshfield (farm bridge)	1
Northfield (farm bridge)	1
Rockingham	1
Shelburne (museum)	1
Weathersfield (farm bridge)	1
Wilmington (farm bridge)	1
Jericho	1
TOTAL	15

RAILROAD BRIDGES

Rutland Railway Shoreham (discontinued)	1
St. Johnsbury and Lamoille County Railroad Wolcott	1
St. Johnsbury and Lamoille County Railroad Swanton (discontinued)	1
TOTAL	3



LEGEND

- PUBLIC HIGHWAY BRIDGE
- BRIDGE ON PRIVATE ROAD
- RAILROAD BRIDGE
- CONNECTICUT RIVER BRIDGE (Maintained by New Hampshire)

- 4-LANE INTERSTATE HIGHWAY
- 2-LANE INTERSTATE HIGHWAY
- INTERCHANGE
- U.S. HIGHWAY
- STATE HIGHWAY
- OTHER NUMBERED HIGHWAY
- CONNECTING ROADS

N

VERMONT COVERED BRIDGES

STATE OF VERMONT DEPARTMENT OF HIGHWAYS

JULY 1, 1963

PUBLIC HIGHWAY BRIDGES

ADDISON COUNTY	
Cornwall	1/2
Middlebury	1 1/2
Salisbury	1/2
Weybridge	1/2
TOTAL	3
BENNINGTON COUNTY	
Arlington	1
Bennington	3
Sunderland	1
TOTAL	5
CALEDONIA COUNTY	
Danville	1
Lyndon	4
TOTAL	5
CHITTENDEN COUNTY	
Charlotte	3
Westford	1
TOTAL	4
ESSEX COUNTY	
None	
FRANKLIN COUNTY	
Enosburg	1
Fairfax	1
Fairfield	1
Montgomery	6
TOTAL	9
GRAND ISLE COUNTY	
None	
LAMOILLE COUNTY	
Belvidere	2
Cambridge	2
Hyde Park	1
Johnson	3
Morristown	1
Stowe	1
Waterville	3
TOTAL	13
ORANGE COUNTY	
Chelsea	1
Randolph	3
Thetford	2
Tunbridge	5
TOTAL	11
RUTLAND COUNTY	
Brandon	2
Clarendon	1
Pittsford	3 1/2
Proctor	1/2
Shrewsbury	1
TOTAL	8
ORLEANS COUNTY	
Troy	1
WASHINGTON COUNTY	
East Montpelier	1
Fayston	1
Northfield	5
Waitsfield	2
Warren	1
TOTAL	10
WINDHAM COUNTY	
Brattleboro	1
Dummerston	1
Grafton	1
Guilford	1
Newfane	1
Rockingham	5
Townshend	1
Westminster	1
TOTAL	12
WINDSOR COUNTY	
Hartland	2
Springfield	1
Weathersfield	2
West Windsor	2
Woodstock	2
TOTAL	9
STATE TOTAL	90

NOTE: A 1/2 bridge is one located on a town line.

CONNECTICUT RIVER BRIDGES

(On the Vermont – New Hampshire State Line, but maintained by New Hampshire)

Lemington, Vt – Columbia, N.H.	1
Lunenburg, Vt. – Lancaster, N.H.	1
Newbury, Vt. – Haverhill, N.H.	1
Windsor, Vt. – Cornish, N.H.	1
TOTAL	4

HISTORIC SITES COMMISSION BRIDGES

Townshend	1
Pittsford	1/2
TOTAL	

PRIVATE BRIDGES

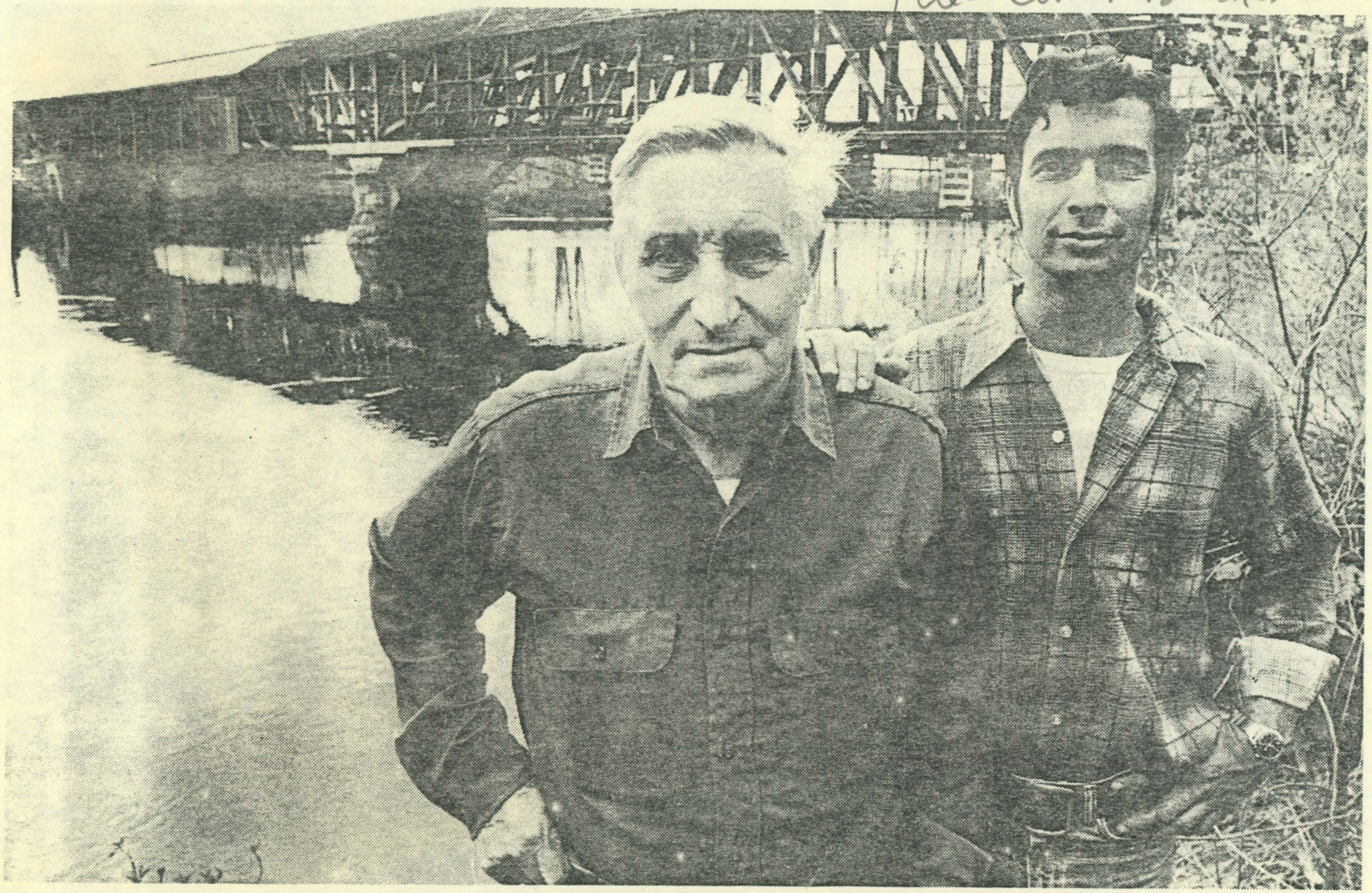
Cambridge (farm bridge)	1
Ferrisburg (farm bridge)	1
Irasburg (farm bridge)	1
Marshfield (farm bridge)	1
Northfield (farm bridge)	1
Shelburne (museum)	1
Weathersfield (farm bridge)	1
Wilmington (farm bridge)	1
TOTAL	8

RAILROAD BRIDGES

Montpelier and Barre R.R. Between Montpelier and Barre (discontinued)	1
Rutland Ry. (discontinued)	1
St. Johnsbury and Lamoille County R.R.	
At Swanton	1
At Cambridge Jct.	1
West of Wolcott	1
Between Hardwick (at Wolcott)	1
TOTAL	6

2-'56

File - Covered Bridges



Milton Graton, left, and his son Arnold, are working to restore a 396-foot covered

bridge that spans the Connecticut River between South Newbury and Haverhill, N.H.

Bridge doctor Milton Graton gives his 112-year-old patient a new lease on life

By NANCY SHULINS

SOUTH NEWBURY — The patient is 112 years old and in traction, joints gnarled and twisted, frame sagging.

But the doctor, Milton Graton, says the Bedell Bridge is slowly getting well.

Working with hand tools and aided by two assistants, Graton is restoring the 396-foot covered bridge that spans the Connecticut River between South Newbury and Haverhill, N.H.

Perched on a plank suspended alongside the wooden bridge, the 69-year-old Ashland, N.H., bridge expert is relaxed as he performs the delicate surgery.

Mostly obscured by beams and cribwork, Graton carries on his work at one of the five remaining bridges spanning the Connecticut.

The Bedell, warped by time, bufeted by floods and crippled by neglect, was "in terrible sad shape when I got here," Graton says.

While the most critical phase is behind him, Graton says, much work remains. A new roof is being shingled and side boards replaced. Some 64 vertical posts that support the trusses are being fitted and damaged joints rebuilt.

If he believed in metal, the job might be easier. But for Graton, building bridges of steel is "like shooting a deer in the zoo. There's just no challenge to it."

"If the state folks have a job and want metal, they get someone else," he says, stroking the spruce posts at the Vermont entrance. "This modern generation knows all about concrete and steel. When they see wood, they make a campfire out of it."

Graton sees the Bedell as the challenge of his life. "All the others got me ready for this one. I can't make a mistake."

His work can be found from Canada to Michigan. In all, he has restored 22 bridges over the course of 20 years. Five others were built from scratch.

His knowledge grew out of a job moving bridges for the U.S. Army Corps of Engineers. In the process, Graton began to make repairs. Before long, he wanted to do more.

His dusty pickup first bounced and rattled down the dirt road to the Bedell Bridge five years ago.

Today, silver hair falls over his tanned forehead, and his dusty work boots step deliberately past the rotting boards. He knows he must be careful.

On sunny days, a few townspeople from both sides of the river arrive at mid-morning to watch and wait. Graton stops work to show them newly-restored sections of the bridge he calls "the masterpiece."

Deep inside, somewhere between Vermont and New Hampshire, he points to sutures of spruce and braces of fir.

The engineers come later in the day to admire the complex web of jacks and cables constructed by Graton, a high school graduate.

At first glance, the Bedell appears solidly anchored to the Vermont and New Hampshire shores. Look again. The bridge is suspended in air.

It hangs from steel slings, a suspension bridge within a bridge. The steel cables are anchored at either end by huge oak logs that lie buried under loads of gravel.

By tightening the cables with hydraulic jacks, Graton and his son Arnold were able to straighten out the bridge, which once drooped two feet on the Vermont side and 31 inches on the New Hampshire side.

"At first, the gravel we brought wasn't enough. It started to slip," Graton confides.

"We added some more and it held. I wasn't sure it would work. But people come to me for answers. I don't want to disappoint them."

There is more at stake than disappointment, Graton says. While 94 of Vermont's covered bridges survive, many are fragile.

With that in mind, Graton works on the nation's remaining landmarks with precision, convinced that a little

Continued on Page 4

Vermonter/Sunday, July 9, 1978/3
Burlington Free Press

tion of retirement. Aging people, like aging bridges, are meant to be useful, he says.

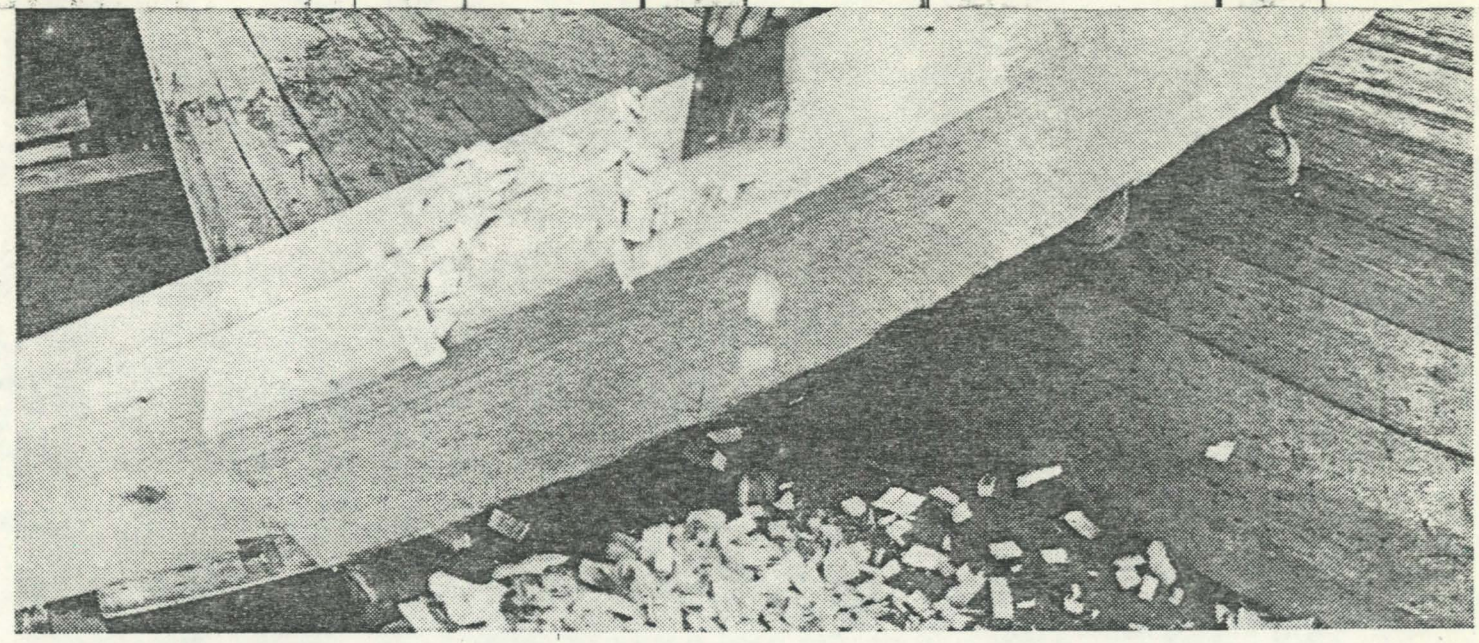
He is planning ahead. On rainy days, Graton records his knowledge in a book about covered bridge repair for people who want to cross the nation's rivers on wood, rather than steel.

"I'm pleased by the interest people are showing in covered bridges today," says Graton. "I don't worry so much about people tearing them down."

But he says he worries about floods — like the 1927 disaster that washed away 50 of Vermont's covered bridges.

Graton still mourns their passing.

Nancy Shulins is a writer for the Associated Press in Montpelier.



Arnold and Milton Graton carve a new spine for the Bedell Bridge, one of five remaining covered bridges that cross the Connecticut River

The KINSA Contest Winners Are Coming!

Next Sunday the photographs of local winners in the 1978 Kodak International Newspaper Snapshot Awards (KINSA) contest will appear in the Vermonter magazine. First place local winners in black-and-white and color categories will receive $50; second place winners will receive $25; third place, $15; fourth place $10.

Local winners will also be eligible for prizes in black-and-white and color categories in the international judging. First place winners in the international contest will receive a 30-day around-the-world trip for two plus $1,000, or $5,000 in cash. Your photo could be a winner.

'Somehow, when a piece rots off, the load shifts to another, stronger place'

Continued from Page 3

attention will be repaid by years of service.

Over a 100-year period, "a covered bridge is the cheapest kind there is," says Graton. "All you have to do is replace the floor boards, which are going to wear out from time to time.

"And once a year, take an air compressor and blow the dirt out of them. That's all."

While repairing bridges is "second nature to me," Graton doesn't bother much trying to explain the physics of how covered bridges support modern loads.

"Somehow, when one piece rots off, the load shifts to another, stronger place. They're put together in such a way to create strengths much greater than the individual timbers."

When the Bedell Bridge is restored to his satisfaction, Graton will travel to Michigan to build a 240-foot span over the Cass River.

The contract, written in his own clear hand on four sheets of white lined paper, seems a bit casual for the $240,000 job. "I guess I have a good reputation," says Graton, who once built a covered bridge in Henniker, N.H., with no contract at all.

Graton looks hurt at the sugges-

Bartonsville - S
Worralls - 1868 - Town Lattice, 87′ - Sanford Granger - Williams River - E. off Rt. 103 — Bridge has a wooden ramp to roadway on west end - Very unusual.

Brattleboro - W
*Creamery - 1879 - Town Lattice, 80′ - Thirteen Men - Whetstone Brook - S. next Rt. 9 — Too many involved in building the bridge to name just one - Sidewalk added 1917.

W. Dummerston - N
W. Dummerston - 1872 - Town Lattice - Two Span, 280′ - Caleb B. Lamson - West River - E. next Rt. 30 — Longest bridge within Vt.

Grafton - W
MacMillan (P) - 1967 - Stringer, 57′ - S. MacMillan - S. Branch Saxton's River - W. on Townshend Rd. — Not a true covered bridge, but picturesque with small waterfall (dam) just upstream from the bridge.

Grafton - C
Kidder Hill - 1870 - Kingpost, 37′ - Unknown - S. Branch Saxton's River - S. off Rt. 121, center of town.

Guilford - W
Green River - 1870 - Town Lattice, 104′ Marcus Worden - Green River - Green River Village — Waterfall (dam) just upstream from bridge - Abutments built by M. H. Day.

Putney - N
Santa's Land (P) - 1956 - Stringer, 30′ - Guy Brunton - Unnamed pond - W. off Rt. 5 in Santa's Land.

Rockingham - NW
Victorian Village (P) - 1967 - Kingpost - Aubrey Stratton - Unnamed brook - S. next Rt.103 at Orton's Country Store — Originally the Depot Bridge, a Queenpost, 1872, built by Harrison Chamberlin, in Townshend, Vt. - Removed and stored in 1959 by Mr. Orton - Rebuilt in 1967.

***Saxtons River - S**
Hall, Barber Park or Osgood - 1867 - Town Lattice, 89′ - Sanford Granger - Saxton's River - N. next Rt. 121 — Construction includes "Flying Buttresses" - Outside braces quite unusual.

W. Townshend - NW
Scott (VHS) - 1870 - Town Lattice & 2 Kingposts - 3 Span, 276′ - Harrison Chamberlin - West River - W. off Rt. 30 below Townshend Dam — Original bridge had one Town Lattice Span 166′, being the longest single span in Vermont - Two Kingpost bridges were added on the west end as the river washed the banks away - An arch added to the Town Lattice section many years ago has collapsed and a temporary center pier was added - The Vermont Historic Sites hopes to restore this bridge during the late 1970's.

Williamsville - W
*Williamsville - 1870 - Town Lattice, 120′ - Eugene P. Wheeler - Stony Brook or South Branch - W. off Rt. 30, Williamsville - So. Newfane Rd.

Wilmington - NE
Twin Silos or High Mowing Farm (P) - 1949 - Town Lattice, 22′ - Haynes Brothers - Unnamed brook on farm - E. off Rt. 100 — This is a small, true reproduction of a Town Lattice Bridge.

WINDSOR COUNTY

Amsden - C
Salmond (P) - 1880 Est. - Multiple Kingpost, 54′ - James F. Tasker — Removed in 1959 when Springfield-Weathersfield Dam Built - Presently used as storage shed by Town of Amsden.

Brownsville - W
Bowers or Brownsville - No Date - Tied Arch, 48′ - Unknown - Mill Brook - N. off Rt. 44.

Brownsville - W
Smith (P) - 1973 - Town Lattice, 36′ - H. P. Cummings Construction Co. - Mill Brook - S. off Rt. 44 — This is one-half of the Garfield Bridge of Hyde Park, built in 1870, removed in the 1960's, and relocated here by Thurston Twigg-Smith - The other one-half is in So. Pomfret.

Brownsville - W
Bests - 1890 - Tied Arch, 37′ - A. W. Swallows - Mill Brook - S. off Rt. 44 — Town Report of W. Windsor 1890 shows bridge built at a cost of $250.13.

Hartland - S
*Martin's Mill - 1881 - Town Lattice, 143′ - Unknown - Lull's Brook - E. off Rt. 5.

Hartland - N
Willard - No Date - Town Lattice, 135′ - Unknown - Ottauquechee River - E. off Rt. 5 — Bridge above natural waterfalls - Just to the East used to be a large woolen mill.

Perkinsville - N
Downers - 1840 Est. - Town Lattice, 80′ Unknown - Black River - W. of Junction Rt. 106 and Rt. 44 — This bridge restored in 1975 and 1976 by Milton Graton & Sons.

Perkinsville - S
Titcomb (P) - 1880 - Multiple Kingpost, 46.6′ - Henry Tasker and James Tasker - Unnamed brook - E.off Rt. 106 — This was originally the Stoughton Bridge, removed in 1959 and restored in 1963 by Andrew A. Titcomb, the present owner.

So. Pomfret - C
Smith (P) - 1973 - Town Lattice, 36′ - H. P. Cummings Construction Co. - Barnard Brook - W. off Rt. 12 near So. Pomfret — This is one-half of the Garfield Bridge of Hyde Park, built 1870, removed in the 1960's and relocated here by Thurston Twigg-Smith - Other one-half in Brownsville.

Quechee - C
Quechee - 1970 - Stringer, 90′ - Quechee Lakes Development - Ottauquechee River - N. off Rt. 4 — This is not a true covered bridge, but because of its size and design it is worthy of mention.

Springfield - E
Baltimore (VHS) - 1870 - Town Lattice, 37′ - Granville Leland - Unnamed brook beside Eureka School House - N. next Rt. 106 — This is a Vermont Historic Site and was relocated and restored in 1970 by Milton Gratton & Sons.

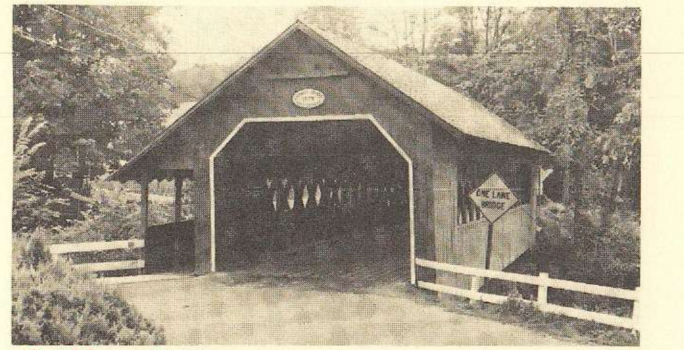
Taftsville - C
Taftsville - 1836 - Multiple Kingpost & Queenpost & Arches & Iron Rods - Two Span, 190′ - Solomon Emmons - Ottauquechee River - N. next Rt. 4 — This bridge has a mongrel truss - There are no other similar trusses anywhere - However, it is very sturdy and has a most picturesque setting with a waterfall above bridge "dam".

Woodstock - C
Middle - 1969 - Town Lattice, 125′ - Milton Graton & Sons - Ottauquechee River - Off Rt. 4 — Vermont's newest authentic town lattice covered bridge - Severely damaged by fire in 1974, it has been completely restored in 1975 and 1976 by the original builder.

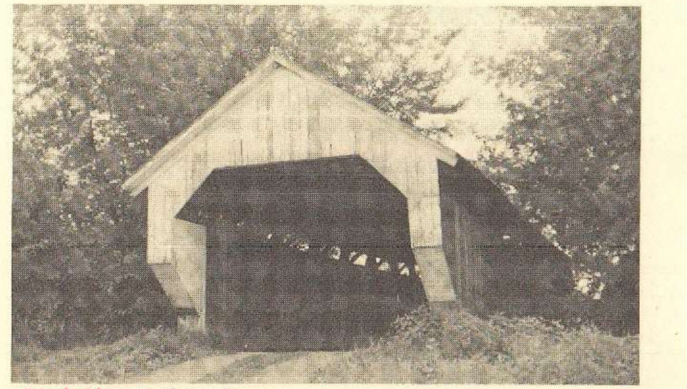
Woodstock - W
Lincoln - 1865 - Pratt Arch, 136′ - R. W. & B. H. Pinney - Ottauquechee River - S. next Rt. 4 — This is only Pratt type truss in Vermont.

Information for this leaflet was compiled by Neal G. Templeton of The First Vermont Bank and Trust Company. Sources of information include town clerks, historical societies, The Vermont State Highway Department, The Vermont Historic Sites Commission, The Connecticut River Valley Covered Bridge Society, The National Society For The Preservation Of Covered Bridges and the various people who own private bridges.

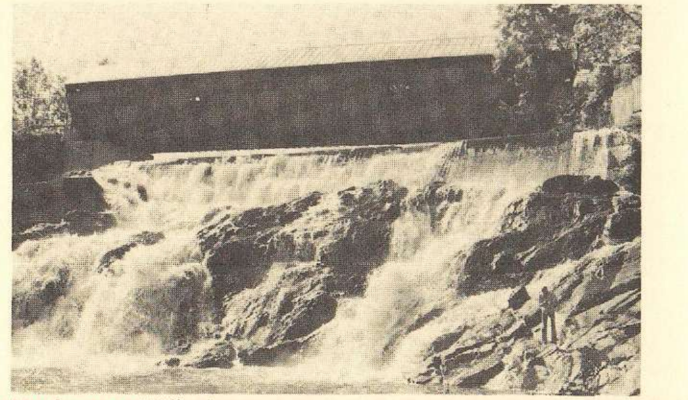
West Dummerston - N West Dummerston



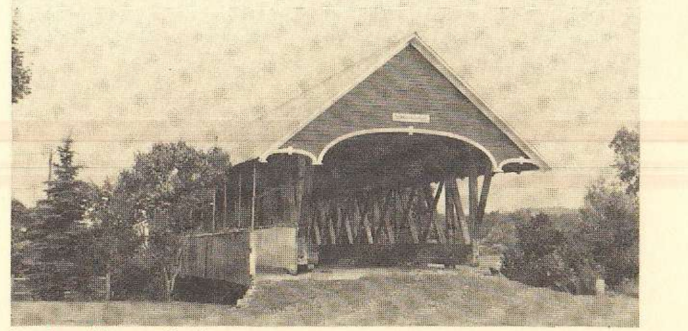
Brattleboro - W Creamery



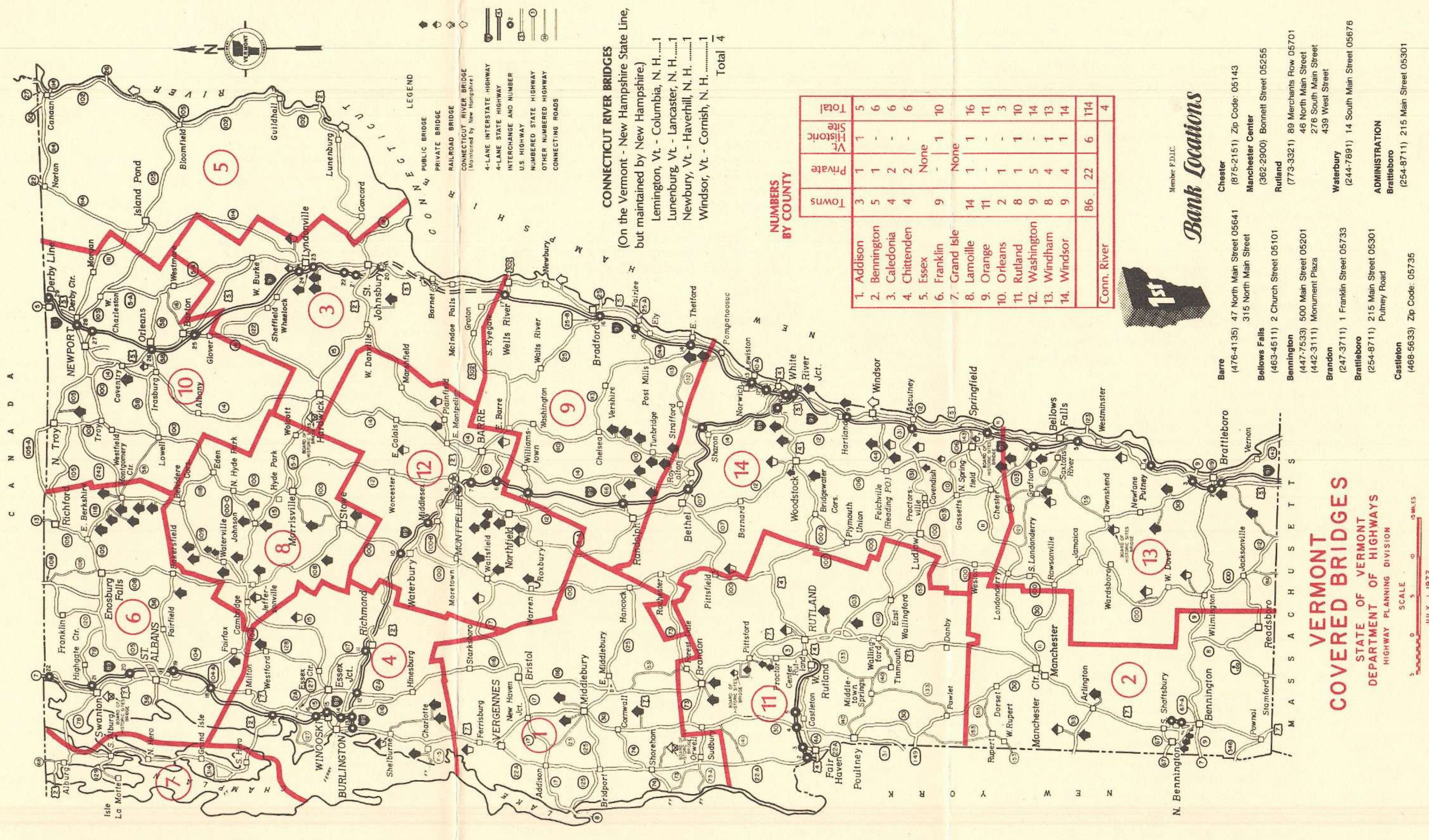
Cambridge - E Gates Farm



Hartland - N Willard



Lyndonville - N Sanborn



CONNECTICUT RIVER BRIDGES
(On the Vermont - New Hampshire State Line, but maintained by New Hampshire.)

Lemington, Vt. - Columbia, N. H. 1
Lunenburg, Vt. - Lancaster, N. H. 1
Newbury, Vt. - Haverhill, N. H. 1
Windsor, Vt. - Cornish, N. H. 1
Total 4

NUMBERS BY COUNTY

	Towns	Private	Vt. Historic Site	Total
1. Addison	3	1	1	5
2. Bennington	5	1	-	6
3. Caledonia	4	2	-	6
4. Chittenden	4	2	-	6
5. Essex		None		
6. Franklin	9	-	1	10
7. Grand Isle		None		
8. Lamoille	14	1	1	16
9. Orange	11	-	-	11
10. Orleans	2	1	-	3
11. Rutland	8	1	1	10
12. Washington	9	5	-	14
13. Windham	8	4	1	13
14. Windsor	9	4	1	14
	86	22	6	114
Conn. River				4

Member F.D.I.C.

Bank Locations

Barre
(476-4135) 47 North Main Street 05641
315 North Main Street

Bellows Falls
(463-4511) 2 Church Street 05101

Bennington
(447-7533) 500 Main Street 05201
(442-3111) Monument Plaza

Brandon
(247-3711) 1 Franklin Street 05733

Brattleboro
(254-8711) 215 Main Street 05301
Putney Road

Castleton
(468-5633) Zip Code: 05735

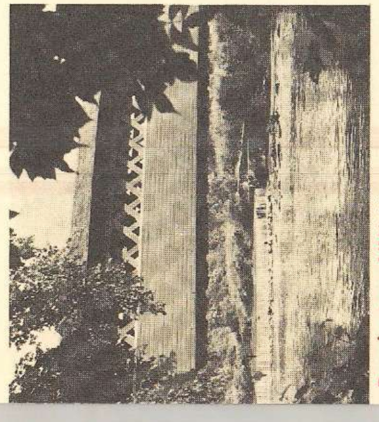
Chester
(875-2151) Zip Code: 05143

Manchester Center
(362-2900) Bonnett Street 05255

Rutland
(773-3321) 89 Merchants Row 05701
46 North Main Street
276 South Main Street
439 West Street

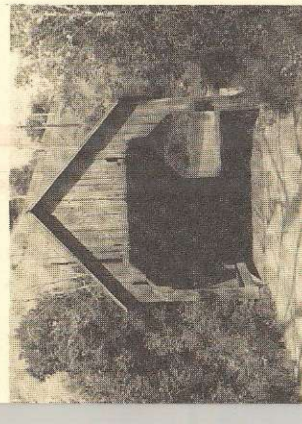
Waterbury
(244-7891) 14 South Main Street 05676

ADMINISTRATION
Brattleboro
(254-8711) 215 Main Street 05301

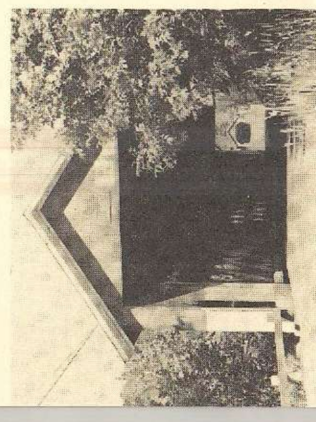


Bennington - NW Henry

Middlebury - NW Pulpmill

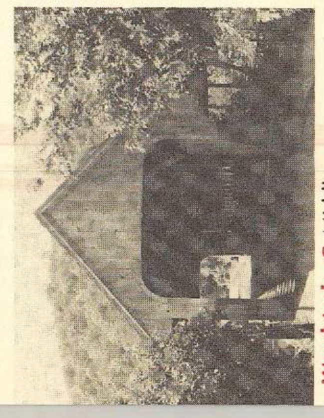


No. Tunbridge - N Flint



Northfield Falls - C Station and Newell

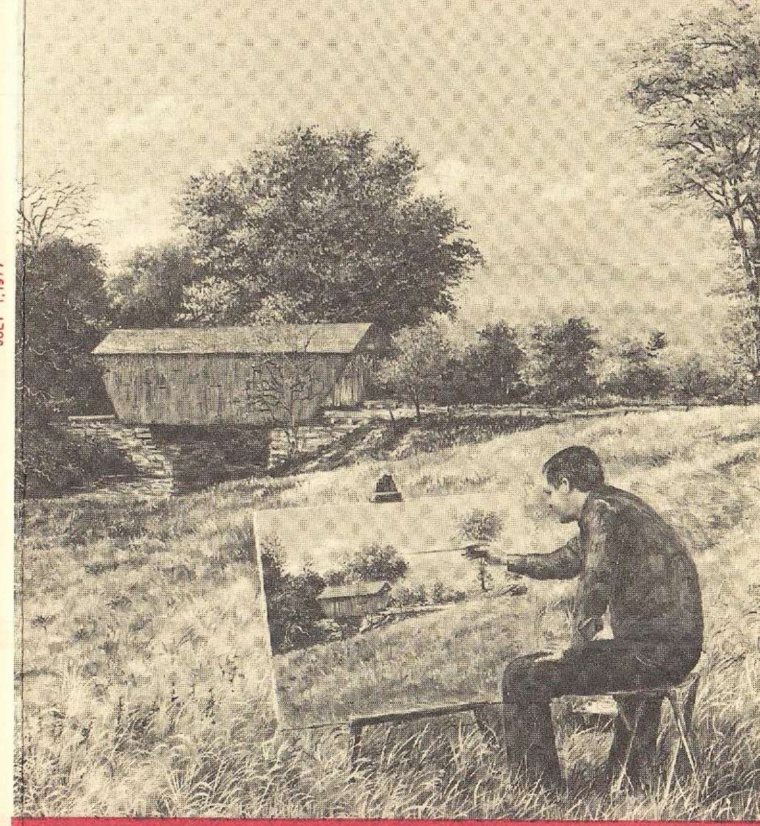
Wolcott - SE Fisher Railroad



Woodstock - C Middle

Vermont's Covered Bridges

by Neal G. Templeton



Cooley Bridge by Bruce Mitchell
Reproduction of a painting from the First Vermont Bank Collection

A Community Service Publication
Courtesy
First Vermont Bank
Member FDIC

3rd Edition - 1980

This leaflet is a documentation of Vermont's most treasured landmark — the Covered Bridge. It salutes the builder-engineers whose construction techniques changed the science of covered bridge building across our land. The location highlights featured in this publication illustrate a story of lasting romance among the people of Vermont for their Green Mountain bridges. The principle reason for this leaflet is to have all visitors to our bridges consider the importance of preserving a vanishing American landmark.

Covered bridges scattered throughout the valleys of Vermont are among the most scenic and memorable attractions that can be found anywhere. Many were uncovered wooden bridges constructed years before they found it expedient to cover and protect them.

The fact that they are covered usually leads to the question, why? The answer is very simple - to protect from the elements and preserve the wooden trusses that make up the bridge. The covering usually does not contribute any strength to the bridge, but it does make it very picturesque. Actually, this was the only part of the construction in which the builder could show his ingenuity in the trimming of the portals and windows.

The earliest trusses were simple wooden Kingposts for short spans and Queenposts for longer spans. The Multiple Kingpost, Long, Paddleford, Burr Arch and Town Lattice trusses were developed next to span much larger rivers. The Howe truss (1840 Patent) revolutionized bridge building by utilizing iron rods with wood. This commercialized bridge building because the members could be pre-cut at a factory and shipped to be easily assembled for erection at the site. Because of the construction and use of bolted iron rods, the bridge could be tightened up and adjusted when necessary. There were other types of trusses made using one or more of the original designs, plus new truss designs that had limited use in their own region.

The first arches were of single planks usually attached to the trusses, but some were built into the trusses. The use of arches of laminated planks gained popularity as a means of strengthening older bridges and in new construction. As engineering developed, it was found that the arches built into the various new bridges were the main load support. The truss strengthened the arch, rather than the arch strengthening the truss, which some old bridge builders would find hard to accept.

The fact that so many covered bridges have been removed is hard to understand. Actually, there were some built that were poorly constructed in the beginning and nothing could be done to correct them. Others were not built strong enough to withstand modern loads. The main problem has been too little headroom or clearance for large vehicles. Actually, if our forefathers had known of these facts they could have built these features into the bridges and they would be more serviceable today. They did build many bridges that carried locomotives which had the necessary height and strength. In May of 1978 the Vermont Agency of Transportation established a fund for the restoration and preservation of Vermont's covered bridges. To date about 50 bridges have been repaired. Bridges having major renovations are designated by an asterisk (*).

Vermont Bridges information is listed so that people can locate the bridges and be able to compare their various characteristics. There are many things that one can look for in visiting covered bridges - for example, type of roof covering, style and

color of covering, portal or entrance shape, window size and placement, river or stream condition, type of abutment or pier construction, size of timbers, cross bracing construction, trunnels or wooden pegs, type of arch (plain, laminated, built in, added), and naturally, how well the bridge blends into the local landscape.

Vermont presently has 114 covered bridges of these various trusses:

Town Lattice	- 43	Pratt Arch	- 1
Queenpost	- 24	Howe	- 1
Kingpost	- 6	Paddleford	- 3
Multiple Kingpost	- 11	Haupt	- 1
Burr Arch	- 9	Stringer	- 9
Tied Arch	- 3	Railroad	- 3

In composing this list we had to decide if every covered bridge should be listed - old, new, large, small, authentic, non-authentic, publicly owned, historic site or privately owned. Basically the bridge listing is composed of authentic truss types, mostly old, and some new. We included some of the larger bridges that have steel and cement decks, but have unusually attractive wooden coverings which are called "Stringer Trusses". We did not list wooden foot bridges. However, they are very interesting and certainly are worth visiting.

The bridges are listed alphabetically by county. The other information is as follows:

(※)	Major renovation since 1978.
Location	Alphabetically by town or village where located.
Name	Most popular name or names.
Date	Construction date or "No Date" listed.
Ownership	P = Private, VHS = Vt. Historic Site, All others = the Towns. Vt. Highway owns one in Lyndonville.
Truss Type	Generally one type, but longer bridges sometimes have more than one type - sometimes truss types are combined.
(A)	This means the original deck beams and braces were removed and steel I beams put in to hold up the deck loads and bridge coverings. These bridges are no longer authentic covered bridges.
Length	Generally the overall length of the bridge.
Span	Usually one span. Where two or more spans appear the fact is noted.
Builder	Name of builder or construction company - sometimes abutment or pier contractor also shown. The word "Unknown" appears where this information has not been found.

River or stream over which the bridge is located.
Major highway or road nearest the bridge location.
Unusual remarks or facts relative to the specific bridge are listed.

The covered bridges over the Connecticut River are owned by the State of New Hampshire.

ADDISON COUNTY

Cornwall - SE
Station - 1865 - Town Lattice, 136' - Unknown - Otter Creek - W. off Rt. 7 four miles — Widest spaced truss members in any town lattice in Vermont - Renovated 1970, New center pier added.

Ferrisburg - N
Spade Farm (P) - 1824 (Unauthenticated) - Town Lattice, 85' - Justin Miller - Small Pond - W. next Rt. 7 — 1953 moved to present location from No. Ferrisburg Hollow.

Middlebury - NE
※Halpin - 1824 Est. - Town Lattice, 66' - Unknown - Muddy Branch of New Haven - E. off Rt. 7 two miles — Highest bridge above stream bed in Vt. - Unusual stone abutments, natural waterfalls below bridge.

Middlebury - NW
※Pulpmill - 1808-1820 Est. - Burr Arch, 179' - Unknown - Otter Creek - Middlebury, Weybridge Rd. - Bridge on town line between Middlebury and Weybridgddge — Two lane bridge of three spans - One of two in Vt. (other at Shelburne Museum) - Only six left in entire United States - Originally built for Waltham Turnpike Company, but date and builder unknown - Only two open to daily traffic in the United States - Waterfalls just below bridge "dam."

Shoreham Ctr.
Rutland Railroad (VHS) - 1897 - Howe, 108' - Rutland Railroad - Lemon Fair River - W. off Rt. 7 at Whiting off Shoreham Ctr. Rd. — Tracks now removed, rail line abandoned - One of three railroad bridges still standing in Vt.

BENNINGTON COUNTY

Bennington - NW
Paper Mill - 1840 Est. - Town Lattice, 125' - Charles F. Sears - Walloomsoc River - S. next Rt. 67A —Waterfalls above bridge "dam".

Bennington . NW
Silk or Locust Grove - 1889 - Town Lattice, 88' - Unknown - Walloomsoc River - S. next Rt. 67A.

Bennington - NW
Henry - 1840 Est. - Town Lattice, 125' - Unknown - Walloomsoc River - S. off Rt. 67A one mile — Double truss rare.

Sunderland
Chiselville - 1870 - Town Lattice (A), 117' - Daniel Oatman - Roaring Brook - E. off Rt. 7 two miles — New center pier added.

W. Arlington
Bridge at the Green - 1852 - Town Lattice, 80' - Unknown - Battenkill River - W. off Rt. 7 next to Rt. 313.

Sandgate
Kreffer (P) - 1977 - Stringer, 39' - Green River - E off W. Arlington-Sandgate Rd. - This planked decked steel I beam bridge has been turned into a covered bridge. - The design was by Susan dePeyster and William Skidmore who was the chief carpenter. - Many local townspeople also have helped build this bridge that goes to Tom Kreffer's home, because they wanted a covered bridge in their town.

CALEDONIA COUNTY

Danville - SE
Green Bank Hollow - 1886 - Queenpost, 50' - Unknown - Joe's Brook - S. off Rt. 2 at Danville 2 1/2 miles.

Lyndon Corner - C
Schoolhouse - 1879 - Queenpost, 42' - J. C. Jones, Designer, Lee Goodell, Builder - So. Branch Passumpsic - W. off Rt. 5, So. Wheelock Branch Rd. — It is reported that the stone bridge abutments were built by John Clement who built 30 other bridge foundations in the Lyndonville area.

Lyndon Corner - C
Chamberlin or Whitcomb - 1881 - Queenpost, 66' - W. W. Heath, Superintendent - So. Branch Passumpsic - W. off Rt. 5, York St. and Middle Rd.

Lyndonville - N
Sanborn (P) or Center - 1869 - Paddleford, 120' - Unknown - Passumpsic - W. off Rt. 5, Junction of Rt. 114 — Bridge moved in 1960 to present location owned by Lynburk Motel and used as a real estate office.

Lyndonville - NE
Randall or Burrington (P) - 1865 - Queenpost, 66' - Unknown - Passumpsic - SE off Rt. 114, 3 miles N. of Lyndonville.

Lyndon Center - N
Miller's Run or Bradley - 1878 - Queenpost, 56' - E. H. Stone, Superintendent - Miller's Run - On Rt. 122. Vt. Highway Dept. owns this one bridge only.

CHITTENDEN COUNTY

Charlotte - NW
Lakeshore - No Date - Tied Arch, 39' - Leonard Sherman - Holmes Creek - W. off Rt. 7 Lake Road.

E. Charlotte - S
Lower or Quinlan - 1849 - Burr Arch, 87' - Unknown - Lewis Creek - E. off Rt. 7, Road to No. Ferrisburg.

E. Charlotte - S
Upper - 1849 - Burr Arch, 58' - Unknown - Lewis Creek - E. of Quinlan Bridge.

Jericho - E
Mills (P) - 1967 - Stringer, 25' - Merton Mills - Brown River - E. off Rt. 15 - This bridge is on the entrance road to a camping area that is operated by the Mills.

Shelburne - C
Museum (P) - 1845 - Burr Arch, 168' - Farewell Wetherby - Burr Pond - W. next R. 7 — Privately owned by Shelburne Museum - 1951 moved from Cambridge, Vt. and restored by Walter B. Hill - one of two two-lane bridges in Vt., the other located on Middlebury-Weybridge town line - Probably best restored bridge in Vt.

Westford - C
Westford or Brown's - 1837 - Burr Arch, 97' - Unknown - Brown's River - E. off Rt. 128 — Very heavy hewn timbers - Renovated in 1976 by Townspeople and Vt. Seabee Reserves - Natural waterfalls below bridge.

ESSEX COUNTY (None)

FRANKLIN COUNTY

E. Fairfield - S
E. Fairfield - 1865 Est. - Queenpost, 68' - Unknown - Black Creek - S. next Rt. 36.

Enosburg - NE
Hopkins - 1875 Town Lattice, 80' - Sheldon & Savannah Jewett - Trout River - W. next Rt. 118.

Fairfax - C
Lower or Maple St. - 1865 - Town Lattice, 57' - Kingsbury & Stone - Mill brook - S. off Rt. 104.

Montgomery - C
Fuller or Blackfalls - 1890 - Town Lattice, 55' - Sheldon & Savannah Jewett - Black Falls Creek - N. next Rt. 118.

Montgomery - S
Cornstock - 1883 - Town Lattice, 80' - Sheldon & Savannah Jewett - Trout River - S. next Rt. 118.

Montgomery - SW
West Hill or Crystal Springs - 1883 - Town Lattice, 40' - Sheldon & Savannah Jewett - West Hill Brook - S. off Rt. 118 three miles — Natural waterfall at bridge - on abandoned side road.

Montgomery - NW
Longley or Hamois - 1863 - Town Lattice, 89' - Sheldon & Savannah Jewett - Trout River - W. next Rt. 118.

Montgomery Ctr. - W
Hectorsville - 1883 - Town Lattice (Added Kingpost Brace), 54' - Sheldon & Savannah Jewett - So. Branch Trout - W. off Rt. 118 one mile.

Montgomery Ctr. - W
Hutchins - 1883 - Town Lattice, 54' - Sheldon & Savannah Jewett - So. Branch Trout - W. off Rt. 118 one mile — Natural waterfalls below bridge.

Swanton - E
Swanton Railroad (VHS) - 1898 - Town Lattice & Pratt Truss, 369' - St. Johnsbury & L. C. Railroad - Mississquoi River - E. off Rt. 7 — 3 Spans - Longest remaining railroad bridge - Rail line abandoned.

GRAND ISLE COUNTY (None)

LAMOILLE COUNTY

Belvidere Jct. - SW
Mill, Junction or Lower - Unknown - Queenpost (A), 70' - Lewis Robinson - Kelley River - W. off Rt. 109.

Belvidere Jct. - SW
Morgan or Upper - 1887 - Queenpost, 60' - Lewis Robinson, Fred Tracey, Charles Leonard - Kelley River - W. off Rt. 109.

Cambridge - E
Gates Farm or Little (P) - 1897 - Burr Arch, 60' - George W. Holmes - Seymour River - E. off Rt. 15 — 1951 moved by Vt. Highway Dept. to present location which is now used by the farm.

Cambridge Jct. - N
Poland or Junction - 1887 - Burr Arch, 140' - George W. Holmes - Lamoille River - N. off Rt. 15 Bypass to Rt. 109 — Unusual side boarding follows arch curve at center of bridge.

Jeffersonville - S
Grist Mill, Scott or Bryant - No Date - Burr Arch, 80' - Unknown - Brewster Brook - E. off Rt. 108 on Canyon Rd.

Johnson - N
Power House or School St. - 1870 - Queenpost, 75' - Unknown - Gihon River - W. next Rt. 100C — 1960 repaired by Wilmer Locke.

Johnson - N
※Scribner or Mudget - No Date - Queenpost, (A), 48' - Unknown - Gihon River - E. off Rt. 100C — It appears that the covering was added a few years after the bridge was built - Repaired in 1960 by Wilmer Locke.

Johnson - S
Waterman or German - 1868 - Queenpost, 87' - George S. Mills - Waterman Brook - S. off Rt. 15, River Rd.

Morristown - SW
Red or Sterling - 1896 - Queenpost,(A), 66' - Unknown - Sterling Brook - W. off Rt. 100 off Stowe - Morristown Rd.

Stowe - SE
※Stowe Hollow or Gold Brook - 1844 Est. - Howe Truss, 50' - John N. Smith - Gold Brook - E. off Rt. 100 on Gold Brook Rd. — Only Howe Truss road bridge in Vt. - 1969 town resolution for perpetual care.

Stowe - C
Covered Walkway - 1973 - Stringer, 150' - Vt. Highway Dept. - Waterbury River - Leaving Stowe on Rt. 108 — This is a unique covered walkway on the north side of a steel concrete bridge - This is not a true covered bridge, but its size and construction make it worth mentioning.

Stowe - NW
White Caps - 1970 - Cement Stringer, 56' - Clinton H. Thompson - West Branch Waterbury River - S. off Rt. 108 — This is a very cleverly enclosed cement bridge - Not a true covered bridge, but its size and construction make it noteworthy.

Waterville - C
Village or Church St. - 1877 Est. - Queenpost (A), 60' - Unknown - Kelley River - W. off Rt. 109.

Waterville - N
Montgomery or Lower - 1887 - Queenpost (A), 63' - Unknown - Kelley River - E. next Rt. 109.

Waterville - N
Jaynes, Upper or Codding Hollow - 1877 Est. - Queenpost (A), 57' - Unknown - Kelley River - E. next Rt. 109.

Wolcott - SE
※Fisher (VHS) - 1908 - Town Lattice & Pratt (A), 103' - St. Johnsbury & Lamoille Co. R.R. - Lamoille River - S. off Rt. 15 — This is the only covered railroad bridge in use on a regular rail line - Unusual construction has cupola running entire length of ridge pole - Steel I beams now support the deck.

ORANGE COUNTY

Chelsea - S
Moxley or Guy - 1886 - Queenpost, 55' - Arthur Adams - First Branch White River - E. next Rt. 110.

E. Randolph - S
Gifford or C. K. Smith - 1904 - Multiple Kingpost Half Truss (A), 50' - Unknown - Second Branch White River - E. off Rt. 14.

E. Randolph - S
Upper Blaisdell or Johnson - 1904 - Multiple Kingpost Half Truss, (A), 50' - Unknown - Second Branch White River - W. off Rt. 14. Renovated in 1977 by Bridges Inc.

S. Randolph - S
※Hyde or Kingsbury - 1904 - Multiple Kingpost, 45' - Unknown - Second Branch White River - W. next Rt. 14.

Thetford Ctr. - W
Sayers - No Date - Haupt Truss with Arch (A), 80' - Ompompanoosuc River - S. off Rt. 113A — Natural waterfalls below bridge - This is the only Haupt Truss in the Northeast - Only three in the U.S.A. - Unfortunately, it was not restored in 1963 when it was repaired.

So. Tunbridge - N
Howe - 1879 - Multiple Kingpost, 60' - Ira Mudgett, Edward Wells, Chauncey Tenney, foundation work - First Branch White River - E. next Rt. 110.

Tunbridge - C
※Mill, Hayward or Noble - 1883 - Multiple Kingpost, 60' - Unknown - First Branch White River - W. off Rt. 110 in village.

Tunbridge - S
Lower or Cilley - 1883 - Multiple Kingpost, 65' - Unknown - First Branch White River - W. off Rt. 110.

No. Tunbridge - N
Larkin - 1902 - Multiple Kingpost, 55' - Arthur Adams - First Branch White River - E. off Rt. 110.

No. Tunbridge - N
Flint - 1845 - Queenpost, 50' - Unknown - First Branch White River - E. off Rt. 110.

Union Village - C
Union Village - 1867 - Multiple Kingpost, Kingpost Arch added, 100' - Unknown - Ompompanoosuc River - N. off Rt. 132.

ORLEANS COUNTY

Coventry - NW
Lower - 1881 - Paddleford, 87' - John D. Colton - Black River - Coventry Rd. near town.

Irasburg
Orne (P) - 1881 - Paddleford, 50' - John D. Colton - Black River - Labond Farm.

Troy - No. Troy
※River Road or School or Upper - No Date - Town Lattice, 91' - Unknown - Mississquoi - E. Rt. 101 on Big Falls Rd. — Truss held together with single pins or trunnels - All others have two pins.

RUTLAND COUNTY

Brandon - S
Dean or Upper - 1840 - Town Lattice, 136' - Unknown - Otter Creek - S. off Rt. 7.

Brandon - SW
Sanderson or Lower - 1838 - Town Lattice, 132' - Unknown - Otter Creek - Off Rt. 7, Pearl St.

E. Clarendon - W
Kingsley or Mill River - 1836 - Town Lattice, 120' - T. K. Norton - Mill River - SW off Rt. 103.

Florence - E
Depot - 1840 - Town Lattice, 121' - Unknown - Otter Creek - W. off Rt. 7, Florence Rd. - Samuel Carrara of Pittsford renovated the bridge and abutments in 1974.

Pittsfield - S
Giorgetti (P) - 1976 - Cement/Stringer, 55' - John Giorgetti - Tweed River - E. off Rt. 100 — This bridge formerly belonged to the town. After acquiring it Mr. Giorgetti turned it into a covered bridge with material from an old barn even to the pegged timbers and rusty roof.

Pittsford - S
Cooley - 1849 - Town Lattice, 60' - Nicholas Powers - Furnace Brook - Old Pittsford, Proctor Rd. — Unusual extended gables over portals - Powers was Vermont's most famous bridge builder - His bridge at Blenheim, N. Y. is the longest single span remaining in the world - Also, it is a two-lane bridge.

Pittsford - N
Hammond (VHS) - 1843 - Town Lattice, 139' - Asa Nourse - Otter Creek - W. off Rt. 7, Pittsford, Florence Rd.

Pittsford - S
Gorham or Goodnough - 1841 - Town Lattice, 114' - Abraham Owen, Nicholas Powers - Otter Creek - Old Pittsford, Proctor Rd.

Rutland - N
Twin Bridge - 1850 - Town Lattice, 60' - Nicholas Powers — Beside cement bridge on East Creek being used as a storage shed by the town of Rutland. This was one of two bridges that were only 10 to 15 feet apart. After the first bridge was built a flood made a new river channel so a new bridge was built to span it. These bridges lasted until 1947 when the E. Pittsford Dam broke and caused a flood. One bridge was ruined and the other made into a storage barn.

Shrewsbury - W
※Brown - 1880 - Town Lattice, 100' - Nicholas Powers - Cold River - E. off Rt. 7, No. Shrewsbury Rd.

WASHINGTON COUNTY

E. Barre - N
Robbin's Nest (P) - 1964 - Queenpost, 50' - Robert Robbins - Jail Brook - S. next Rt. 302 — This is the newest authentic Queenpost built in Vermont.

Calais
Kent's Corner (P) - 1963 - Kingpost, 22' - Kent Museum - Curtis Brook - W. off Rt. 14 at Kent's Corners.

Marshfield - S
Orton Farm (P) - 1890 - Queenpost, 50' - Herman F. Townsend - Winooski River - E. off Rt. 2.

E. Montpelier - NE
Coburn or Cemetery - 1851 - Queenpost (A), 50' - Mr. Coburn - Winooski River - NW off Rt. 2. Renovated in 1974 by Vt. Highway Dept.

Northfield - SW
Chamberlin (P) - 1956 - Kingpost 22' - Mahlon Chamberlin - Stony Brook - 2.5 miles beyond the Mosley covered bridge.

Northfield - SW
Moseley - 1899 - Kingpost (A), 39' - John Moseley - Stony Brook - W. off Rt. 12A .8 mile.

Northfield Falls - W
Slaughter House - No Date - Queenpost, 55' - Unknown - Dog River - W. off Rt. 12, South of church.

Northfield Falls - C
Station - No Date - Town Lattice (A), 100' - Unknown - Dog River - W. off Rt. 12 — One of three bridges within ¾ mile - Another bridge can be seen just west of this, which is the Newell - Only place in New England where two bridges can be seen at once.

Northfield Falls - W
Newell - No Date - Queenpost (A), 55' - Unknown - Cox Brook - West of Station Bridge.

Northfield Falls - W
Upper - No Date - Queenpost (A), 42' - Unknown - Cox Brook - West of Newell Bridge.

Waitsfield - C
Village or Big Eddy - 1833 - Burr Arch, 113' - Unknown - Mad River - E. off Rt. 100 — Restored 1975 by Milton Graton & Sons.

Waitsfield - NE
Pine Brook or Wilder - 1872 - Kingpost, 40' - Unknown - Pine Brook - E. off Rt. 100 — Restored 1976 by Milton Graton & Sons -Only Kingpost with wooden center post.

Warren - W
Warren - 1880 - Queenpost, 37' - Walter Bagley - Mad River - E. off Rt. 100 — Waterfalls just below bridge "dam".

Warren - Fayston - W
Battleground (P) - 1975 - Stringer, 65' - Battleground Condominium Development - Mill Brook - N. next Mad River Glenn Ski Area Rd. — This is not a true covered bridge, but its superb design, size and construction makes it well worth mentioning.

WINDHAM COUNTY

Bartonsville - S
Bartonsville - 1870 - Town Lattice, 151' - Sanford Granger - Williams River - N. off Rt. 103, one-half mile.

Gilford, NH

BARNS & BRIDGES

Post & Beam

Wooden Covered Bridges

Of New England

603-293-0402

May 11, 1998

Mr. John Dumville
State of Vermont
Division for Historic Preservation
National Life Building
Drawer 20
Montpelier, Vermont 05620-1501

Dear Mr. Dunville:

On Halloween Night, 1997, the town of Irasburg, VT, lost to arson its only historical covered bridge. Although the state plans to replace this bridge with a new covered bridge, the historical significance can never be replaced. In addition, replacement costs for that bridge would be in excess of $300,000.

What could have been done to prevent this tragedy? Quite simply, the town of Irasburg could have treated their bridge with a product called Nochar's Fire Preventer (NFP)™. For a few thousand dollars, they could have helped prevent the loss of this important structure.

Look at the advantages of using NFP as opposed to other types of protection (i.e. alarms, sprinkler systems, videos, toxic coatings, etc.):

- NFP costs less than other systems
- NFP is non-toxic in application and in service.
- NFP is permanent and carries a 30-year limited interior warranty
- NFP does not change the appearance of wood
- NFP does not contribute to the fuel load

NFP protects 24 hours a day, and does not rely on power supply, water, or early fire detection (an asset in remote locations where an all-volunteer fire department exists). NFP goes to work immediately at reducing the rate of flame spread, while other detection/suppression systems respond ONLY when a fire has established itself.

An ever-increasing number of engineers, architects, and homeowners are specifying the application of NFP to wooden structures. To date, some 20 covered bridges have been protected with NFP. In addition, NFP carries the endorsement of the National Society for the Preservation of Covered Bridges.

Barns & Bridges of NE specializes in the repair and replacement of wooden covered bridges, and our employees and associates are factory trained in the application of NFP and related products. It is our intention to protect as many covered bridges in 1998 as possible. NFP should also be considered for other historic structures in your town.

Typical unit costs for NFP protection are $96.00 PER LINEAL FOOT*. Although NFP is permanent and lasts indefinitely, let's use the 30-year warranty period to establish the amortized cost of NFP protection:

100 foot covered bridge
× 96.00 per lineal foot
$ 9,600.00 cost for protection
÷ 30 years
$ 320 per year cost

I believe you will agree that $320 per year is a small price to pay to protect these historical structure of our transportation past. "No other form of protection is as cost effective or works as well as NFP."

As of this writing we are working with insurance underwriters to reduce premiums for fire protection of structures treated with NFP. If successful in this task, lower premiums would help defer the costs of applying NFP.

Included please find a NFP product brochure and product test strips for your review.

If we can be of further assistance in this matter, or if you would like to discuss planning the application of NFP to your bridge or bridges in 1998, please call or write us at:

Barns & Bridges of NE
182 Tate Road
Gilford, NH 03246
Phone (603) 293-0402
Fax (603) 293-2604

Thank you for your time and consideration. We look forward to hearing from you.

Sincerely,

Timothy Andrews

Timothy Andrews
Barns & Bridges of NE

* This price may vary depending on the complexity of the truss.

NOCHAR'S NON-TOXIC NFP--PAPER STRIP TEST

While you must see the items in person to realize how remarkable they are, this little strip of newspaper will give an idea. The larger side, "above" the colored line, was treated with NFP. The area "below" the colored line was not treated. Note that the paper has a normal look, color and texture. (Because NFP is water borne, the treated area will have some aspects of paper that has been in the rain and then dried.)

FOR the demonstration, hold the paper diagonally, with the short untreated side at the lower end, away from your hand. Apply a flame to the untreated, lower end. You will see that the flame goes up the paper normally, until it hits the colored line. Once the flame hits the treated area, the paper will cease charring and will not sustain a flame. You can now apple a match or lighter directly to the treated area and see no flame spread will occur. Of course the presence of an outside flame will turn the treated area to ash, but something that was treated will not add to the "fuel load". NFP is designed to slow & retard the spread of a fire, so that appropriate fire fighting steps can be taken, & individuals will have an opportunity to escape.

Pension Liability None.
Pfd Stock $110 mill. **Pfd Div'd** $20.0 million
6.0 mill. shs. non-voting, redeemable for Cdn$25.00, together with accrued dividends. Thereafter dividends are payable quarterly at 70% of the Canadian bank prime rate. (2% of Cap'l)
Common Stock 594,732,300 shs. (54% of Cap'l)

CURRENT POSITION ($MILL.)	1993	1994	12/31/95
Cash Assets	496.0	514.0	391.0
Receivables	671.0	821.0	1375.0
Inventory (FIFO)	272.0	292.0	339.0
Other	331.0	318.0	389.0

--	--	410.0	454.0	455.0	520.0	552.0	552.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
--	--	24.4%	12.5%	11.5%	16.4%	13.3%	17.6%	17.4%	15.2%	*17.0%*	*20.0%*	**Income Tax Rate**	*27.0%*
--	--	8.7%	8.9%	8.5%	5.7%	5.9%	6.0%	6.7%	6.6%	*6.3%*	*5.8%*	**Net Profit Margin**	*8.7%*
--	--	d165.0	142.0	150.0	d59.0	110.0	111.0	d61.0	380.0	*NMF*	*NMF*	**Working Cap'l ($mill)**	*265*
--	--	1150.0	1627.0	1852.0	2752.0	2983.0	2993.0	3376.0	3115.0	*5400*	*5000*	**Long-Term Debt ($mill)**	*3200*
--	--	2329.0	2968.0	4022.0	3222.0	3007.0	2992.0	3252.0	3933.0	*4630*	*4990*	**Net Worth ($mill)**	*6355*
--	--	13.2%	11.4%	9.2%	7.1%	7.4%	7.3%	7.8%	8.5%	*6.5%*	*7.0%*	**% Earned Total Cap'l**	*11.0%*
--	--	17.6%	15.3%	11.3%	9.9%	11.7%	11.8%	13.1%	12.2%	*10.5%*	*10.0%*	**% Earned Net Worth**	*14.0%*
--	--	12.2%	7.8%	8.9%	4.4%	6.4%	7.3%	8.3%	7.3%	*4.0%*	*3.5%*	**% Retained to Com Eq**	*9.0%*
--	--	34%	56%	36%	59%	49%	40%	39%	39%	*67%*	*70%*	**% All Div'ds to Net Prof**	*43%*

BUSINESS: Thomson Corp. is primarily in the publishing business, but has operations in the travel industry. Info./Publ. group (50% of '95 sales; 68% of op. prof.) provides specialized info. for various travel agencies in U.K. Sold U.K. newspaper oper., 9/95. Acquired West Publishing, 7/96. '95 depr. rate: 13.0%. Has about 32,700 empl. Thomson family contrls. over 70% of com. stk. ...

market. The exceptional fourth-quarter ... however, appear to be an aberration and we expect growth to resume a modest, but sustainable, 2.0%-2.5% pace.

The December-period leading indicator for the chemical industry also registered its strongest improvement of the year (+2.6%), notwithstanding the continued decline in chemical process industries production. New housing starts, despite declining in December, due to inclement weather in the West, are helping to drive the indicator. And based on the rate of new mortgage

standards of living are leading to greater meat consumption and more grain use. Meanwhile, overseas buying continues, facilitated by such trade measures as the North American Free Trade Agreement and the World Trade Organization. The emerging markets of Asia and Latin America offer the promise of growth for the next several years. Investors should keep in mind, however, that this industry tends to be cyclical and is greatly impacted by weather.

Investment Advice

Once again this industry remains in the bottom tier of ... only one stock in

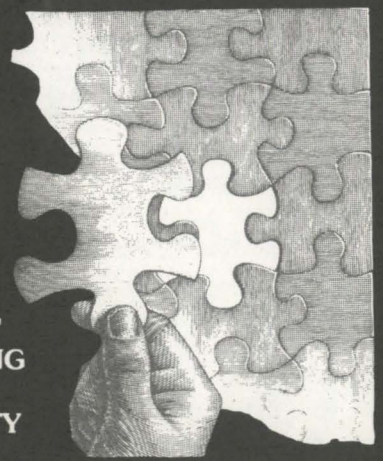
Debt Due	6.4	12.3	8.3
Other	73.1	64.8	68.7
Current Liab.	87.3	83.2	77.2

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '93-'95 to '99-'01
Revenues	-2.5%	-7.5%	3.5%
"Cash Flow"	--	--	NMF
Earnings	--	--	NMF
Dividends	--	--	Nil
Book Value	-4.5%	-15.5%	14.0%

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun.30	Sep.30	Dec.31	Full Year

terials (Steck Vaughn). Acq'd Deltak and RSI 5/86; Coastal Busi- 2601 Main St., Suite 700 Irvine, CA 92714. Tel.: 714-474-9400.

National Education's training group (NETG) is making a profitable turnaround. In 1995, this unit took a $74.5 million charge for restructuring and new program development to improve results. It appears this worked since last year NETG turned in an operating profit of $6.3 million on sales of $57.9 million, compared to an operating loss of $8.9 mil- last two years, ICS has spent fewer marketing dollars on lower-margined vocational courses and more money on courses aimed at a higher-income professional market. This move is paying off in the form of higher earnings since not only are the new courses higher-margined, but there are more of them (100 instead of 10) and they reach the market more quickly



nochar's Fire Preventer™ THE MISSING PIECE TO FIRE SAFETY

"PREVENTION"

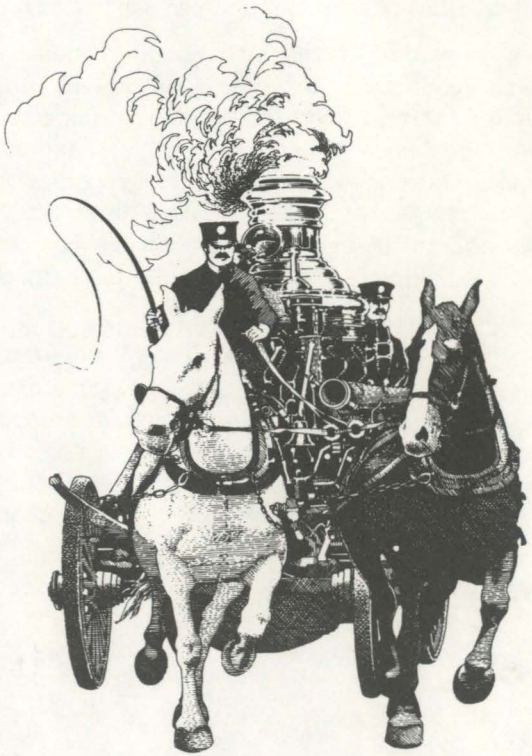
Fire Preventer™ is a state of the art fire retardant that was developed to be used as part of the sound reduction system for jet aircraft while on the ground. **nochar's Fire Preventer™** has been tested at temperatures of over 5,000 degrees Fahrenheit. **nochar's Fire Preventer™** does not emit toxic gasses or contribute to flame spread at any temperature. **nochar's Fire Preventer™** WILL LAST THE LIFE OF THE FIBER TREATED AS LONG AS IT IS NOT EXPOSED TO WATER.

Products treated by the retardant for exterior use must be retreated periodically unless sealed. Ultraviolet rays and extreme heat or cold do not effect the retardant qualities produced by **nochar's Fire Preventer™**

Fire Preventer™ is a non-toxic, non-skin irritant, non-eye irritant, and biodegradable product. It has been tested on various wood and paper products as well as textiles and bedding straw. Nochar, the manufacturer, will be glad to send the test results from any of the tests to interested parties. Please contact your local distributor or Nochar directly.

ASTM ratings for fire retardancy can only be certified by a recognized independent laboratory under stringent quality controlled application. Any other use of the product is to provide additional fire safety above those provided for by individual state building codes. **nochar's Fire Preventer™** is not to be used as a substitute for any such building code materials unless certified by a pertinent laboratory.

Is Your Approach To Fire Safety Outdated?



Give Yourself a Fire Brake

nochar

Nature's Partner in Fire Protection

FIRE SAFETY & WHAT YOU SHOULD KNOW

nochar's Fire Preventer

Nature's Partner in Fire Protection

A State of the Art Fire Retardant

Developed for Home, Military, Industrial & Agricultural Uses.

ATTENTION HOMEOWNERS

Fire Preventer™ The fire prevention solution.

THE PRIMARY MEANS TO FIRE SAFETY IS PREVENTION. Natural fibers such as cotton, wool, paper, and wood do not emit or give off unnatural gasses during a fire. Synthetic materials such as foam, plastics, and nylon not only melt during a fire but they give off toxic gasses that are not detectable by some smoke detectors. These gasses are thought to be one of the primary killers resulting from fires. Various states are currently passing or considering legislation to limit the use of these killers in hotels, nursing homes, hospitals, and schools.

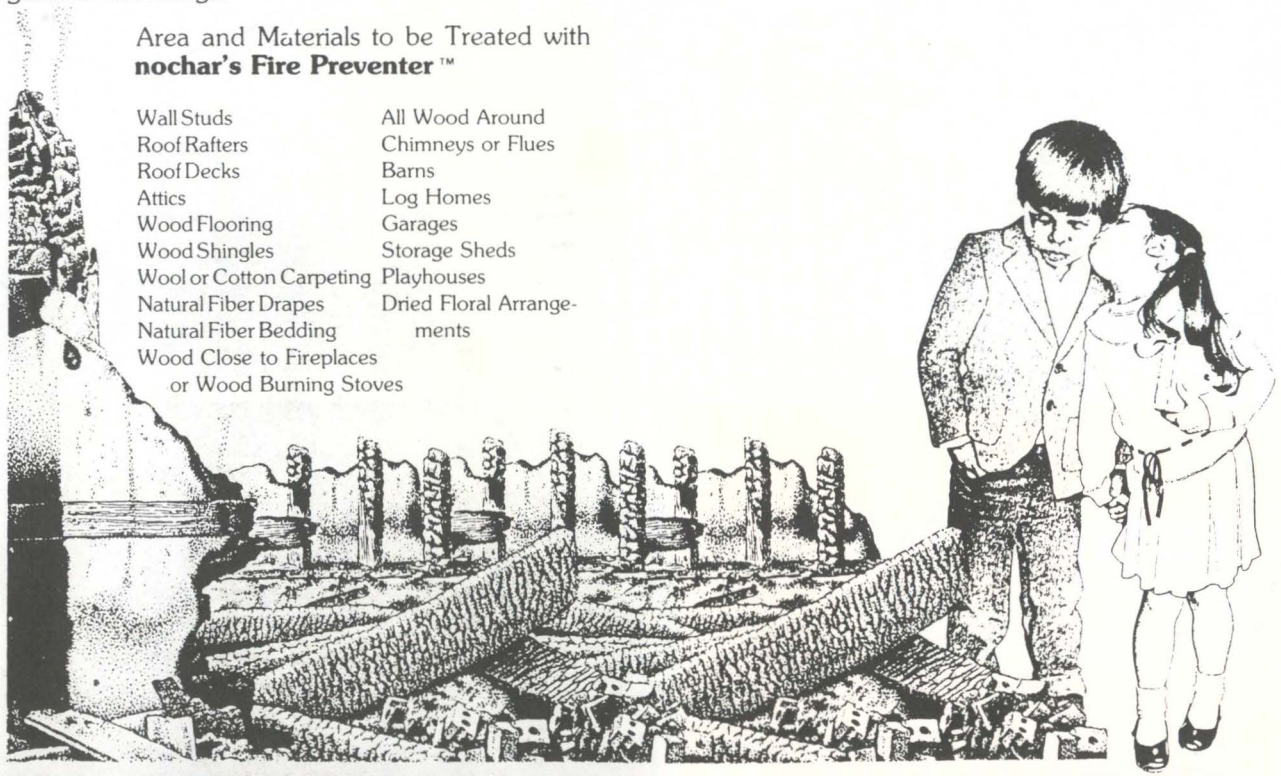
You should consider these same facts when redecorating, remodeling, or planning a new home.

Fire Preventer™ is a fire retardant that works exclusively on unsealed or unpainted natural surfaces.

Wood and paper are the best thermal and sound insulators known to man. Once they have been treated for flame spread they can be used to the greatest advantage.

Area and Materials to be Treated with **nochar's Fire Preventer™**

- Wall Studs
- Roof Rafters
- Roof Decks
- Attics
- Wood Flooring
- Wood Shingles
- Wool or Cotton Carpeting
- Natural Fiber Drapes
- Natural Fiber Bedding
- Wood Close to Fireplaces or Wood Burning Stoves
- All Wood Around Chimneys or Flues
- Barns
- Log Homes
- Garages
- Storage Sheds
- Playhouses
- Dried Floral Arrangements



When a fire starts in a wall or kitchen it begins to travel upwards eventually penetrating the attic area, once the fire breaks through the attic it races the length of the house and the damage is maximized.

Fire Preventer™ raises the temperature it takes to start a fire. Should a fire start from other fuel sources, **nochar's Fire Preventer™** slows the speed at which the flames spread, thus giving you and your family more time to get out of the building. By slowing the progress of the fire you have also given the fire department more time to arrive at the scene and knock the fire down to minimize the damage.

Don't leave the fire safety of your home to chance. In addition to using **nochar's Fire Preventer™**, place an adequate number and type of fire extinguishers throughout your house. Smoke detectors should also be placed in the attic as well as other key places in your home, but please remember that fire safety begins with prevention. Use **nochar's Fire Preventer™**

FIRE SAFETY IS NO ACCIDENT

CLOTHING FOR CHILDREN AND THE ELDERLY

The U.S. Government requires all clothing for children under two years old to be fire retarded. The retardant treatment must be a durable treatment or last at least 25 washings. The normal clothing sold in this situation is synthetic fiber. Synthetic fiber will melt at certain temperatures even though it has been treated and will not support flame, these melted fibers must then be surgically removed from the skin. Natural fibers do not melt, on the contrary, their natural insulation properties help shield the skin from the heat, as long as they have been fire retarded. Synthetic fibers conduct heat immediately to the childs skin.

nochar's Fire Preventer™ when applied to natural fiber clothing is considered a non-durable treatment that will normally last one washing, and can be easily reapplied by rinsing the garment in the product before drying.

The same treatment is recommended for the elderly or anyone who works around fire hazards such as welders.

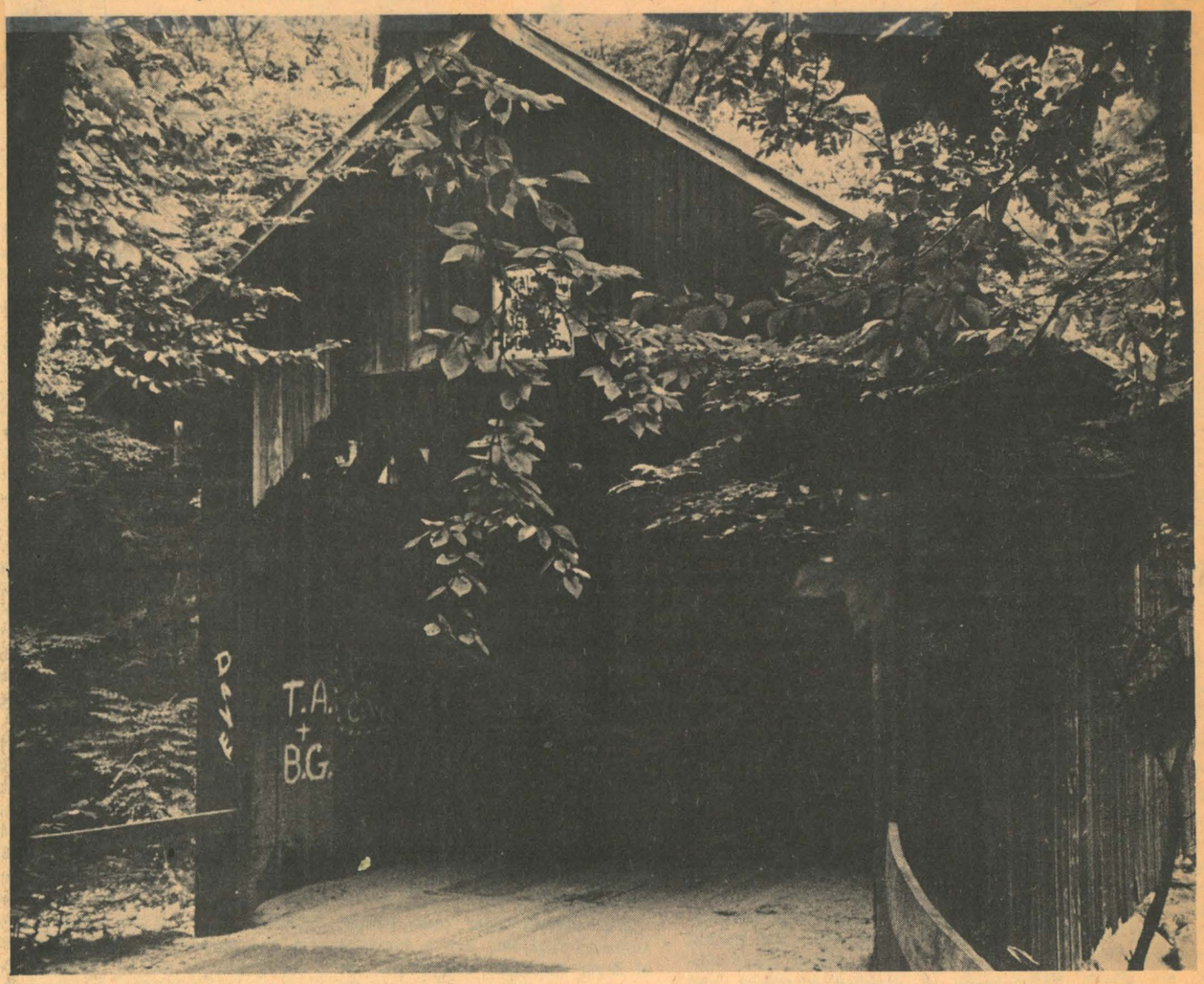
ATTENTION BUILDING CONTRACTORS:

REDUCE the fire risks during construction by treating the areas around torches and power tools with nochar's Fire Preventer™

nochar's Fire Preventer™ is used for:

- Hospital Laundry (for bedding & gowns)
- Kitchen Cabinet Mfg.
- Furniture Mfg.
- Cotton Ginning & Bale Storage
- Bedding Straw (race tracks & livestock shows)
- Forest Fire Control
- Barns (dairy & equipment storage)
- Building Materials Mfg.
- Paper Mfg.
- Shipping Crates
- Shipping and Storage Cartons
- Fire Safety Uniforms
- Fireplace Installation
- Anti-rekindle for Fire Depts.
- Fire Breaks for Brush Fires
- Amusement Parks
- And Many New Uses Developed Daily

Rutland Daily Herald 8-17-68 RUTLAND, VERMONT, SATU



This covered bridge is off the beaten path. It spans the Cold River between Rutland and North Shrewsbury, and it's off the main road. But from the evidence on the walls, many teenagers have found it. More than 600 bridge-lovers are in the area this weekend for a big covered bridge festival. Headquarters for the affair is the Rutland Fairgrounds.

Herald photo — Marro

Covered Bridge Lore Draws 600 to Area

By GEORGE BELLEROSE

"A covered bridge is covered for the same reason that grandmother used to wear petticoats — to protect the underpinnings," said Herbert Richardson, one of 600 covered bridge enthusiasts in Rutland for a weekend of bridge viewing.

Richardson, president of the National Society for the Preservation of Covered Bridges, and other bridge enthusiasts, will depart from the Rutland Fairgrounds Saturday at 8:30 a.m. for a guided tour of covered bridges in the Rutland area.

The tour, led by Phillipe Bonnet, is open to the public and will be followed by a church supper at the Brick Church in North Clarendon from 5 to 7 p.m.

On Sunday, the group will travel to Woodstock to watch construction on the first covered bridge on a main highway in Vermont since 1900.

There are many reasons given for the covering of bridges, most of them false. Some people have said that bridges were covered so horses wouldn't be nervous when they crossed chasms and streams. Others have argued that bridges were covered to protect the floor.

But the real reason, bridge experts agree, was to protect the main beams used to span the stream.

"Each builder had his own way of building a bridge. Some would lay the floor boards across the main beams, others diagonally. Some liked to put gingerbread on the portals, others left it plain," said Richardson.

They used what materials were readily at hand — pine, oak, and spruce — if it were available. They didn't study books to build bridges. They studied barns and churches and copied from the original covered bridge builders in Europe.

"They used to have a hard time convincing the townspeople that a bridge would be strong enough," said Milton Graton, a modern day bridge builder. "So they would make a model. Then someone would stand on it and it wouldn't break. The townspeople would be convinced."

People today place their faith in steel and concrete. But to covered bridgers there is nothing as strong and lasting as a covered bridge.

"If you build a bridge with a foot or so of camber (bend), it'll settle down firmly into the abutments and you'll never get a sag," says Graton.

Floods such as the 1927 disaster (which claimed 400 Vermont covered bridges) cause greater damage to concrete bridges than covered bridges, Graton feels.

"You build the sides of a bridge so you can remove them quickly in times of flood and you'll find that you save many bridges," says Graton.

Nevertheless, Vermont, which once had more than 1,000 bridges, now has but 105. Rutland, which 40 years ago had eight covered bridges within the city, now has none.

Covered bridges are slowly disappearing: they tend to be too narrow, there are few craftsmen who can build them and it's difficult to find properly seasoned wood.

Yet for the people who spend their weekends looking at the bridges Ithiel Town and Peter Paddleford made 150 years ago, it seems like anyone can slap together steel and concrete. But only the Towns, Paddlefords and Whipples knew what a bridge should be.

4/18

April 10, 1963

Mr. Matthew I. Wiencke, President
The Thetford Center Community Association
Thetford Center, Vermont

Dear Mr. Wiencke:

I acknowledge receipt of your letter of February 27 and thank you for the same. (Covered bridge)

We have referred this to the Board of Historic Sites.

Sincerely,

Philip H. Hoff

Philip H. Hoff
Governor

PHH/lcm

THE THETFORD CENTER COMMUNITY ASSOCIATION

THETFORD CENTER, VT.

27 February 1963.

Hon. Philip Hoff,
Governor of Vermont,
Executive Chamber, State House
Montpelier

Dear Governor Hoff:

We wish to call to your attention the historic significance of the Covered Bridge which spans the Pompanoosuc at Thetford Center. It is one of the three last remaining covered bridges of the Haupt-truss design in America. The other two are Virginia and North Carolina. The authority for this statement is Mr. Richard Sanders Allen, Covered Bridges of the Middle Atlantic States, Brattleboro, Vermont, 1959, p. 81.

The members of the Thetford Center Community Association urges that immediate steps be taken to see that this unique landmark in Vermont and the northeast United States be properly identified with an appropriate marker.

Enclosed is an off-print of a speech by Senator Prouty regarding the bridge which appeared in the Congressional Record for February 20, 1963.

Sincerely yours,

THE THETFORD CENTER COMMUNITY ASSOCIATION

Matthew I. Wiencke

Matthew I. Wiencke, pres.

FOR. Governor Hoff.

REMARKS OF SENATOR WINSTON L. PROUTY OF VERMONT IN THE SENATE ON THE THETFORD CENTER COVERED BRIDGE

United States of America

Congressional Record

PROCEEDINGS AND DEBATES OF THE 88th CONGRESS, FIRST SESSION

Vol. 109 WASHINGTON, WEDNESDAY, FEBRUARY 20, 1963 No. 25

House of Representatives

The House was not in session today. Its next meeting will be held on Thursday, February 21, 1963, at 12 o'clock noon.

Senate

WEDNESDAY, FEBRUARY 20, 1963

VERMONT'S COVERED BRIDGES

Mr. PROUTY. Mr. President, one of the great attractions which Vermont holds for tourists is our covered bridges. Orange County has four of these, and the one at Thetford Center is the only remaining Haupt-truss bridge in the northeastern United States.

Matthew I. Wiencke, president of the Thetford Center Community Association, recently brought to my attention an interesting article about the history of the Thetford Center Bridge and the need for repairing it. The article brings to focus the fact that the bridge was designed by Gen. Herman Haupt who served under the leadership of Abraham Lincoln. It also points out that the Green Mountain State has nearly half of the covered bridges in the Northeastern United States.

With the thought that it may be of interest to all Members of the Senate and the general public I ask unanimous consent to have printed in the RECORD at this point an article by Martha H. Wiencke which appeared in the White River Valley Herald February 7, 1963.

There being no objection, the article was ordered to be printed in the RECORD, as follows:

[From the Randolph (Vt.) White River Valley Herald, Feb. 7, 1963]

THETFORD CENTER'S COVERED BRIDGE IN NEED OF REPAIR

(By Martha H. Wiencke)

What do visitors to Vermont first ask to see? According to the Vermont tourist booth in Rutland, they ask, "Where are the covered bridges?" Vermont does, in fact, have nearly half of the covered bridges in the Northeastern United States, 118 out of a total of 241. But, in the whole area from Hartland to Newbury, the interested visitor can see only two, both in Thetford. One, the fine multiple kingpost bridge in Union Village, was restored some years ago. The other, on Mill Road in Thetford Center, is in need of friends who will see to its repair in the immediate future.

The Thetford Center Bridge is well worth repairing. It is a fascinating example of the old wood beam and trunnel construction, and more than that, it is the only remaining bridge in the whole Northeastern United States built on the design patented by Gen. Herman Haupt. Richard Allen, leading authority on covered bridges, says in his book "Covered Bridges of the Northeast" (1957) that a copy of General Haupt's book on bridge construction must have reached Thetford Center. Perhaps the Thetford town fathers were impressed by General Haupt's reputation as engineer of the Hoosac tunnel, and as general in charge of military railroads during the Civil War. If so, they were in good company.

In 1863, President Lincoln saw one of Haupt's emergency bridges, built in record time, and remarked that he had "seen the most remarkable structure that human eyes ever rested upon. That man Haupt built a bridge acros Potomac Creek, about 400 feet long and nearly 100 feet high, over which loaded trains are running every hour, and, upon my word, gentlemen, there is nothing in it but beanpoles and cornstalks." The Potomac Creek bridge was built in 9 days by soldiers who were not mechanics, but it carried 10 to 20 trains a day and withstood heavy rains as well.

MODEST BUT STRONG

The Thetford Center Bridge is built on a far more modest scale and for permanent use. But its Haupt truss plan, to the credit of its builders, was considerably more complicated to construct than was the very popular town lattice style, according to Mr. Allen. Here in Thetford we can justly feel that we have a real historic monument, both to a distinguished engineer and to the sound craftmanship of the early builders and town fathers. The bridge has borne years of traffic without major repair, and, when repaired, can be expected to bear traffic for many more generations.

Builders of new steel and concrete bridges have discovered the advantages of the old bridges too late. In Woodstock, Mr. Allen says (Rare Old Covered Bridges of Windsor County, 1962) that the "old covered span on U.S. 4 withstood storms, high water, and heavy traffic for 3 years short of a century—and it took dynamite to demolish it. By way of contrast, its concrete successor erected in 1938 had to have new railings, flooring, and pier repairs to the tune of $31,000 after only 17 years' service. Woodstock's two remaining covered bridges were carefully renovated, and are now considered to be practical, economical, long-term investments."

KEEN INTEREST

Interest in covered bridges is very high these days all over the country. Mr. Allen is now preparing, with the help of a Guggenheim grant, a book on the covered bridges of the Middle West, where new covered bridges are even now being built to attract visitors. Winterset, Iowa, has put out a pamphlet calling attention to the seven old bridges in its county. Pictures of covered bridges appear again and again in the travel pages of the big city papers. Towns all over New England are repairing their few remaining covered bridges and directing tourists to them. And many inquiries have come here from out-of-Staters, urging that the Thetford Center Bridge be kept.

Mrs. O. H. Lincoln, of Greenfield, Mass., writes to friends in Thetford, "These old timbered spans are certainly a part of our early America."

Mrs. Gertrude N. Birchard, of Springfield, Mass., adds "Too often after a bridge has been taken down the surrounding area regrets it. * * * Let's do all we can to save this fine example of the Haupt truss design."

Mrs. Philip N. Cristal, formerly of Milwaukee, Wis., and a long-time summer visitor to this area, heard about the bridge on a trip to Washington, D.C. She urges, "Please, please, don't let them tear down the covered bridge—I know it well. * * * From the standpoint of people loving New England and coming from all over the country to enjoy it—save it. The preservation movement has swept all over the country. New England should be in the vanguard."

Congressman ROBERT T. STAFFORD writes, "I am in general sympathy with the efforts of the people of Thetford to preserve this bridge."

Edward J. Conklin, Windsor, chairman of the Board of Historic Sites, writes, "It would seem to me that as a tourist attraction it would be well worth the effort of the town and highway department to do all they can to restore this bridge for traffic."

As the recreation industry grows in Vermont, and Thetford grows with it, we can be sure that many more visitors will stop to share our pride in Thetford's two historic bridges. We have a responsibility to our past to preserve our unique bridge for the generations to come.

If you are interested, write to Ralph Fifield, Thetford Center. Letters are needed at once.

RECEIVED

FEB 28 9 30 AM '63

EXECUTIVE
DEPT.

George Little Press
INCORPORATED
DIAL 4-5791
750 PINE STREET BURLINGTON, VERMONT
OFFSET • LITHOGRAPHERS

May meeting

Attention: Vermont State Board of Historic Sites.

HANOVER GAZETTE

Seventy - Seven Years on the Hanover Plain

.00 Per Year | HANOVER GAZETTE | 10c Per Copy

Historic Thetford Covered Bridge Restoration Is A Pending Decision

By MARTHA H. WIENCKE

Covered bridge fans, and tourists on the lookout for the real New England and its historic past, are well acquainted with the name of Thetford. For in Thetford two covered bridges still span the Ompompanoosuc River and are still in use after many decades of service to the town. One of the bridges still stands in Union Village where the road leads up to Thetford Hill; this bridge was restored not too long ago and gives the sightseer a chance to see a fine example of the handsome multiple kingpost type of bridge construction. The other bridge is in Thetford Center on Mill Road (also called Tucker Hill Road), and although it is at present in need of repair it is an even more interesting bridge both for its construction and for its historical connection.

Everyone knows that there are many covered bridges in Vermont today, and, in fact, Richard Sanders Allen in his book **Covered Bridges of the Northeast,** published in 1957, lists the surprising number of 118 Vermont bridges out of a total of 241. Yet the Thetford Center bridge, according to Mr. Allen, is the only one of its design in the whole northeastern United States. The design was invented in 1839 by General Haupt, the Civil War army engineer who built the famous Hoosac Tunnel.

General Haupt wrote books on bridge construction, and Mr. Allen believes that one of these must have come into the hands of the builders of the Thetford Center bridge. In any case, the Thetford builders did a fine job of constructing the complicated diagonals and kingposts which Haupt's design required, and they added a pair of auxiliary arches on their own. The Haupt design is described by Mr. Allen as "a combination of the Town lattice and multiple kingpost."

Simple Town lattice bridges are especially common; Mr. Allen lists 46 examples of this type in Vermont alone, and he explains its popularity by the fact that it was easily constructed by ordinary carpenters. There are three Town lattice bridges in the town of Bennington alone, which have been recently restored very handsomely, and they have become a great attraction to visitors, so much so that the selectmen have printed a map furnishing directions for sightseers.

Thetford people are proud of their unique bridge and its workmanship and hope that it can be restored before very long. So if you are thinking of a sightseeing trip, come pay a visit to the Haupt covered bridge in Thetford Center. Perhaps you may also want to visit the old town cemetery near the bridge and see the grave of Vermont's Revolutionary War hero Richard Wallace. Be sure to take time to walk through the bridge so that you can look at the complex truss work and arches from close at hand, and view the falls of the river below. You will be seeing a real historic monument as well as a covered bridge with an unusual and fascinating design.

THURSDAY, APRIL 19, 1962 Vol. 77, No. 16

VALLEY NEWS — Serving Lebanon, N.H. — White River Junction, Vt. — Hanover, N.H. — And The Upper Valley

Thetford's Covered Bridges

COVERED BRIDGE FANS, and tourists on the lookout for the real New England and its historic past, are well acquainted with the name of Thetford. For in Thetford two covered bridges still span the Ompompanoosuc River and are still in use after many decades of service to the town. One of the bridges stands in Union Village where the road leads up to Thetford Hill; this bridge was restored not too long ago and gives the sightseer a chance to see a fine example of the handsome multiple kingpost type of bridge construction. The other bridge is in Thetford Center on Mill Road (also called Tucker Hill road), and although it is at present in need of repair it is an even more interesting bridge both for its construction and for its historical connection.

✣ ✣ ✣

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THETFORD PEOPLE are proud of their unique bridge and its workmanship and hope that it can be restored before very long. So if you are thinking of a sightseeing trip, come pay a visit to the Haupt covered bridge in Thetford Center. Perhaps you may also want to visit the old town cemetery near the Bridge and see the grave of Vermont's Revolutionary War hero Richard Wallace. Be sure to take time to walk through the bridge so that you can look at the complex truss work and arches from close at hand, and view the falls of the river below. You will be seeing a real historic monument as well as a covered bridge with an unusual and fascinating design.

—Mrs. Matthew I. Wiencke.

APR 30 10 49

THETFORD CENTER COMMUNITY ASSOCIATION

THETFORD CENTER, VERMONT

April 26, 1962

Mr. Frederick N. Cook, Supervisor
of Historic Sites
State Board of Historic Sites
Montpelier, Vt.

Dear Mr. Cook:

Enclosed we are sending clippings from the Hanover Gazette, April 19, 1962, a featured article on the front page; and from the Valley News, April 25, 1962, the same article on the Covered Bridge at Thetford Center. An article with two photographs is shortly to come out in the White River Valley Herald. And this we hope is only a start in bringing to the attention of the people of this State the unique historic bridge here in Thetford.

We have learned that General Haupt, the inventor of the design of this bridge, was a graduate of West Point where he was a classmate of General Meade. He invented the design in 1840, when he was 23 years old, as he explains in his book, General Theory of Bridge Construction (New York 1853). He gives a complete description of the design with drawings. He held many posts, including that of Chief Engineer of the Pennsylvania Railroad, a member of the Board of Visitors, West Point Military Academy, and was particularly active throughout the Civil War. He held an important post at the Battle of Gettysburg; he had some 19 bridges, destroyed by Lee between the Gettysburg area and the capital, in working order within two days after the battle. The emergency bridges he built for the railroads during the Civil War were remarkable feats of engineering and speed. For example, one in the area of Fredericksburg, Va., 150 feet in length, begun on a Saturday was finished on Sunday, so that a military train could pass over it. He was a friend of Lincoln and one of his most efficient generals.

In these years of the Centennial of the Civil War, it would seem that this landmark, as a working proof of the skill and enduring qualities of bridge-building by one of greatest engineers of that war, is deserving of special attention. Should it not be properly marked, and the attention of Vermont's summer visitors drawn to it?

We shall continue in our efforts and appreciate your interest.

Yours truly,
M. Wiencke
M. Wiencke, Vice-President
Thetford Center Community Assoc.

WILLIAM B. PINNEY
DIRECTOR

STATE OF VERMONT
AGENCY OF DEVELOPMENT AND COMMUNITY AFFAIRS
HISTORIC PRESERVATION DIVISION
MONTPELIER, VERMONT 05602
(802) 828-3226

December 12, 1975

Mr. Neal G. Templeton
28 Wantastiquet Drive
Brattleboro, Vermont 05301

In reply to your letter about the status of covered bridges in Vermont, I believe it is safe to say that our situation is a generally healthy one. All Vermont Covered bridges have been included in the National Register of Historic Places. I believe we are the only state that has taken this action. All sites and structures are recorded in our State Register before being submitted to the National Register.

We have been funding covered bridge restoration projects around the State for some time with both state and federal funds appropriated for preservation. Bridges do not have to be state owned for funding. The Scott Bridge in Townsend is under the supervision of this Division. The bridge needs extensive work. Our last estimate was $25,000 and will be considerably more than that at this time. The bridge is eligible for federal funds, but they must be matched by the state and we have not been able to obtain the funds up to this time.

The bridges you mentioned as having received financial support from a national source have all been funded through our Division program. Any town is welcome to apply to us for federal preservation funds if they have matching funds and if their proposed project is pure preservation of the original structure and not replacement with steel and concrete. Steel may be used under a bridge to add to its load-bearing capacity as long as it does not replace any portion of the original structure.

I am enclosing a copy of our State Historic Preservation Act which you will note gives us broad powers. It is our firm policy to preserve every covered bridge in Vermont that we possibly can.

Sincerely,

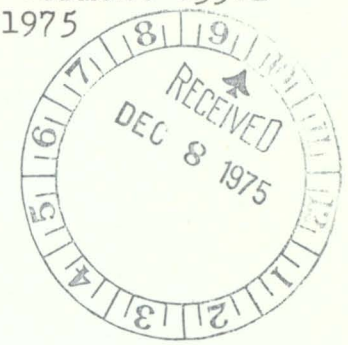
William B. Pinney

William B. Pinney
Director

jap

Enclosure

28 Wantastiquet Drive
Brattleboro, Vermont 05301
December 2, 1975



Mr. William B. Pinney, Director
Agency of Development and Community Affairs
Historic Sites Division
State of Vermont
Montpelier, Vermont 05602

Dear Mr. Pinney:

The Connecticut River Valley Covered Bridge Association is composed of members from all over the United States and Canada. Throughout the last twenty years they have devoted time and effort to search the histories and preserve covered wooden bridges everywhere.

Being a member of the Connecticut River Valley Covered Bridge Association, I have been asked to look into the status of covered wooden bridges that are designated Vermont Historic Sites. We would like a current listing of the various bridges that have been so designated.

We would also like to know what procedure should be followed to have a bridge accepted by the State Society? In connection with repairs, do you have funds available to restore bridges? Does ownership of the bridge have to pass to your Society before money may be advanced for repairs.

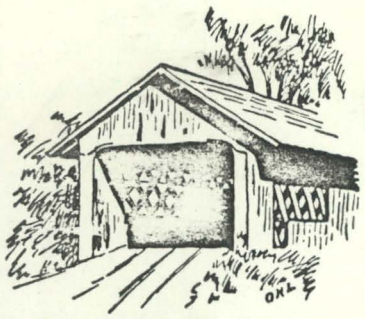
We know that the Scott Bridge of Townshend, Vermont was deeded to your Society. What program do you have for continued upkeep? Do you make periodic visits to determine its status?

The other area that we are interested in is the National Historic Sites support. We know that several Vermont bridges have received financial support from this source. Naturally, we do not want to advise a town to seek the National assistance if there is a State program. Mr. Wellington of the Bedell Association suggested that I write you relative to these questions.

Although I have been interested in bridges for many years, I have only recently become active in the Society. Being a native Vermonter and living here, I am very concerned over the condition of our wooden bridges. I hope you can bring me and the Society up to date on the situation in Vermont.

Very truly yours,

Neal G. Templeton



Remove not the ancient landmark which thy fathers have set.

Proverbs 22:28

Connecticut River Valley Covered Bridge Society

10. Congress Street Apt. 503
Greenfield, Massachusetts 01301

DEC 21 1976

Eric Gilbertson,

The Connecticut River Valley Covered Bridge Society was organized October 1951 by a group of people who were concerned about the rapidity with which the old timbered spans were disappearing. Believing them to be a real part of our heritage we felt a way should be found to save them. This purpose was decided upon. The purpose of this Society shall be to stimulate public interest in the Preservation of Covered Bridges in their original settings wherever it is deemed advisable and to further this purpose in any way possible.

Needless to say many more interested and concerned people joined us and we have meetings here in Greenfield, Mass. on the third Sunday of the month unless voted otherwise. Our dues are $3.00 a year and our magazine, "The Bulletin", is published four times a year. With membership the combination is $5.00 per year. A newsletter is sent to members notifying them of the next meeting and reporting on the previous meeting and also bringing pertinent information as quickly as possible to the members.

Our Society has been involved in many projects to try and preserve some of these very historic old spans. In some instances we have been successful, and in some cases we have seen a number of old spans about to be saved become the victims of the arsonist's torch. We have helped not only to try and save the old spans, but have been instrumental in helping to have some new covered bridges built to replace the old ones.

We adopted early in our existence this quotation from Proverbs for our theme: "Remove not the ancient landmark which thy fathers have set". Proverbs 22:28.

If you are interested in having a part of our American Heritage preserved, we invite you to become one of us and help us in our purpose. We welcome your inquiries and are always glad to assist in any way possible. You may write to the Society thus: Connecticut River Valley Covered Bridge Society, 10 Congress St., Greenfield, Mass. 01301.

Neal Singleton

DEC 21 1976

28 Wantastiquet Drive
Brattleboro, Vermont 05301
December 19, 1976

Eric Gilbertson, Assistant Director
Division of Historic Preservation
Montpelier, Vermont 05602

Dear Mr. Gilbertson:

I enjoyed our visit the other day. I appreciate your and the Department's interest in Vermont's covered bridges. I am sure the public support for your endeavors is everywhere, but the communication problem is tough. If the Conn. River Covered Bridge Society is called upon we can give some down to earth support from our membership.

I have enclosed a membership application with a sample of one of the four yearly bulletins that are issued. I am sure you will enjoy the information contained in these bulletins.

I have also enclosed photo copies of the newspapers thatthe Dummerston Bridge story has been printed in. If I receive other reprints I will send them to you.

I spoke briefly to Peter Benton, our advertising director, relative to the covered bridge movie. He will be in touch with Mr. Pinney in regards to the showing and use of the film.

I don't know if I mentioned it, but I certainly would be glad to hear of your bridge restoration plans as they develop. I realize that you can't release plans that haven't been approved, but I'm sure the covered bridge fans would like to know what the Department's hopes and plans are.

Mr. Pinney asked me to advise your Department of any covered bridges that need attention. Therefore, I am gathering my information so I can give you a report in the near future.

Sincerely yours,

Neal

Neal G. Templeton

STATE OF VERMONT

AGENCY OF DEVELOPMENT AND COMMUNITY AFFAIRS

OFFICE OF THE SECRETARY (802) 828-3211 MONTPELIER, VERMONT 05602

DEPARTMENTS OF:
Economic Development 828-3221
Housing & Community Affairs 828-3217

DIVISIONS OF:
Administration 828-3231
Historic Preservation 828-3226
Vermont Travel Division 828-3236
Vermont Life Magazine 828-3241

January 24, 1979

Dana M. Keister, Director
Office of Historic Preservation
The Department of Economic and
Community Development
Winchester Hall
12 East Church Street
Frederick, Maryland 21701

Dear Mrs. Keister:

Vermont's number of covered bridges has remained steady at about 100 for a number of years.

We are presently engaged in an $867,000 project of doing all needed restoration work to every covered bridge that is not presently in perfect condition. Seventy-four bridges will be involved and the work will range from replacement of a few missing boards and braces to a $100,000 total restoration of the oldest bridge in the state which is a two-lane bridge.

At the outset of this project, I prepared a list of broad guidelines to insure proper treatment of these structures. I am enclosing a copy which I hope will be of use to you.

The main threat to these bridges is the tendency of highway departments to construct a new bridge of modern materials and retain the covered wooden portion resting on the bridge for aesthetic purposes only, thus, destroying the engineering integrity of the structure.

In rare instances where steel "I" beams must be used to render the bridge capable of carrying its load demands, we have required that the "I" beams be built into the abutments under the bridge and independent of the bridge with a one-half inch or one inch clearance in order to act as a backup in the event the bridge is overloaded. The idea of this is to retain all of the original structure and not allow substitution of steel for original wooden members of the bridge.

I am pleased to report that after many years of negotiation, our Transportation Agency now supports us fully in this approach to our covered bridges.

Sincerely,

DIVISION FOR HISTORIC PRESERVATION

William B. Pinney

William B. Pinney
Director/State Historic Preservation Officer

WBP/cjd

Enclosure

THE DEPARTMENT
OF ECONOMIC
AND COMMUNITY
DEVELOPMENT
of Frederick County, Maryland

Donald R. Date, *Executive Director*

December 27, 1978

Mr. William B. Pinney, Director
Division for Historic Preservation
Pavillion Building, 4th floor
Montpelier, Vermont 05602

Dear Mr. Pinney,

This office is currently coordinating the restoration of Frederick County's three remaining covered bridges. The engineering studies are near completion and the project will soon be going to bid.

We are very concerned about methods of qualifying the bids to assure competency on the restoration of wooden structures. Any information which you could provide us on such stipulations for bridges in your state would be greatly appreciated.

Thank you for your prompt attention to this matter.

Sincerely Yours,

Dana M. Keister

(Mrs.) Dana M. Keister
Director
Office of Historic Preservation

DMK:clh

America's covered bridges

Soon after the Revolutionary War, bridge construction took on a new importance in the United States. Bridge building, more art than science, was developed by trial and error. With available materials, early builders created an economical, permanent, long-span design—the covered timber bridge. Although many builders experimented with their own designs, there finally emerged four distinct types of framing. In addition to king and queen post trusses, these four, patented and licensed by their originators—Burr, Town, Long and Howe, made up the majority of bridges actually constructed.

DONALD O. BARTH, M. ASCE
Senior Project Engineer
Forest Products Group
Koppers Company, Inc.
Pittsburgh, Penn.

BRIDGE BUILDING, first as an art and then as a science, really began in this country right after the revolution. Until then, the scattered settled areas along the east coast didn't have a tremendous need to communicate with each other, but rather with England by way of the sea. The many rivers and estuaries made overland travel difficult along the coast. At this time, most small streams that couldn't be forded were crossed with stone masonry arches. Larger crossings were accomplished by the use of ferries. Waiting for the ferry—which always seemed to be on the other side—apparently didn't sit well with our industrious Yankee forefathers. That, together with the new nationalism that brought sharply increased travel and trade between the states, created the need for bridges to cross even the major rivers. The great stone arches that were then common in Europe proved to be impractical for these longer spans—slow to construct and too expensive—so the builders turned to the material they knew and understood, and which existed in plentiful supply—wood.

The young governments, Federal and State alike, had far too many troubles to do much of anything with bridges. They did issue charters to individuals or to toll bridge companies to erect bridges and charge for their use. These first bridges used short-span stringers, spanning from pile bents or rock filled cribs. They were low to the water and susceptible to annual repair or even replacement after the spring floods and ice jams had done their damage.

America's first covered bridge—1805

The foremost of these early builders was Timothy Palmer of Massachusetts. Palmer constructed quite a few significant spans in New England and became known as the best long-span builder in the country. When the Schuylkill Permanent Bridge Company, in Philadelphia, had to abandon their plans for a three span stone masonry arch, they called in Palmer. He put up three spans of timber trussed-arches: two side spans of 150 ft (45.75 m) and a center span of 195 ft (59.48 m) across the Schuylkill River on what is now Market Street. He intended to leave the framing exposed, as he had in all previous construction.

Judge Richard Peters, president of the bridge company, insisted that the structure be roofed and weatherboarded for protection. He reasoned that weatherproofing, in the form of sides and a roof,

Burr style: The Jackson bridge over Sugar Creek, Parke County, Indiana was built in 1861 by J. J. Daniels and is still in service.

would give much longer life to the structure. Experience with exposed timber framing was that only about 10 years of life could be realized, no matter how well the joints were painted or oiled or tarred. The result was America's first known covered bridge—the Schuylkill Permanent Bridge, completed in 1805. It remained in place until 1850, when it was removed to accommodate a new superstructure including a railroad track.

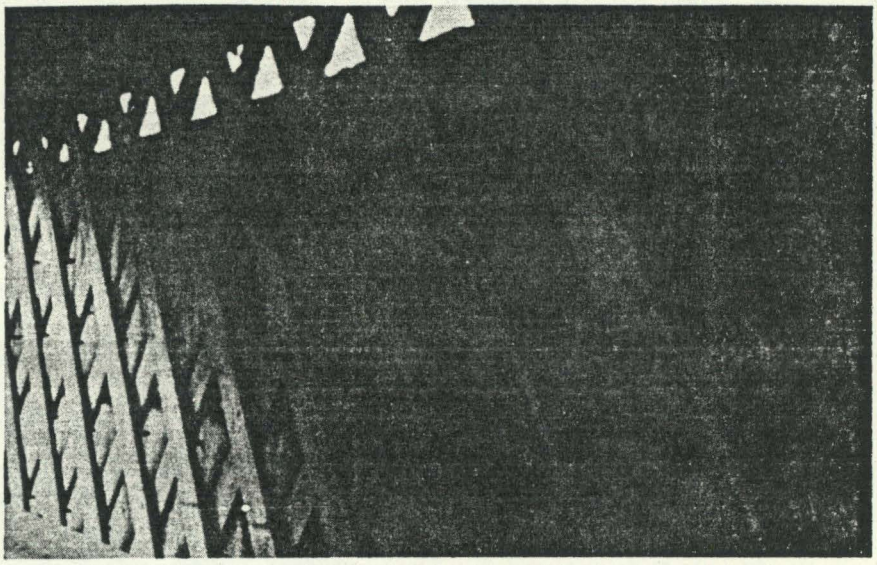
Burr-arch truss design

Another New Englander, Theodore Burr of Connecticut, developed and patented in 1817 a kind of framing that used an arch and truss together, the Burr-arch bridge. After experimenting with several framing arrangements, he settled on what was basically a multiple king post truss combined with an arch which sprang from abutments below the bridge seat. Solid connections from the truss to the arch at every panel post produced a very rigid, but highly indeterminate structure. This type of framing resulted in a level roadway and provided excellent supports for the roof system. Burr was a better bridge builder than business man, and he over-extended himself by accepting five major bridge contracts at the same time over the Susquehanna. One of these, at McCalls Ferry, Pennsylvania, roughly between York and Lancaster, was the longest single span timber arch ever built—360 ft.-4 in. (109.90 m) clear. Built in 1815 under nearly impossible conditions, this world's record span lasted only 3 years—destroyed by an ice jam of equally record proportions. Although Theodore Burr died, hounded by creditors and plagued by legal entanglements in 1822, his arch-truss design became very popular and eventually many hundreds were built during the next century.

Burr's basic idea was followed with many variations. Generally, a pair of arches were used, sandwiching a single truss framework between them. The arches were usually 4 in. to 8 in. (10.16 cm to 20.32 cm) thick. Shorter spans and lighter loads might be carried with a single arch between two trusses, or with small concentric arches. As the spans and loading increased, concentric pairs of arches could be added and finally double truss framing and double concentric arches were used. One of the longest clear span covered bridges left is the 207 ft (63.14 m) Jackson bridge over Sugar Creek in Parke County, Indiana, about 40 miles (64.4 km) west of Indianapolis. Built in 1861 by J. J. Daniels in the Burr style, it is still in service.

Construction methods and tools

The men who built these giant timber structures did so with what we would term primitive tools. Armed with broad axe, adz, chisel and auger, they put together some intricate joints with remarkable workmanship. The hewn-out timbers, generally native white pine, were mortised and tenoned together, with wooden pegs and wedges to act as locks. These structures made little use of iron connections except for a few bolts. The wedged connections were important, in that they could be tightened as the green timbers that were often used in construction seasoned and shrank.



Town truss: Doubling and tripling the rows of planks and increasing the number of pins allowed heavier loads and longer spans.

Splices in the arches themselves were ordinarily butted. Where pairs of arches were used, the joints were staggered. Top chord splices in compression were butted or half lapped and pinned through with wooden treenails. Splices in the bottom tension chords were much more elaborate involving the use of sloping step scarfs, keys or similar means of transmitting the tension force from piece to piece.

The vertical posts were often hewn to provide seats for the main diagonals. In addition, they were notched to receive the bottom chord members which were continued on past to permit the tension stress in the post to be carried.

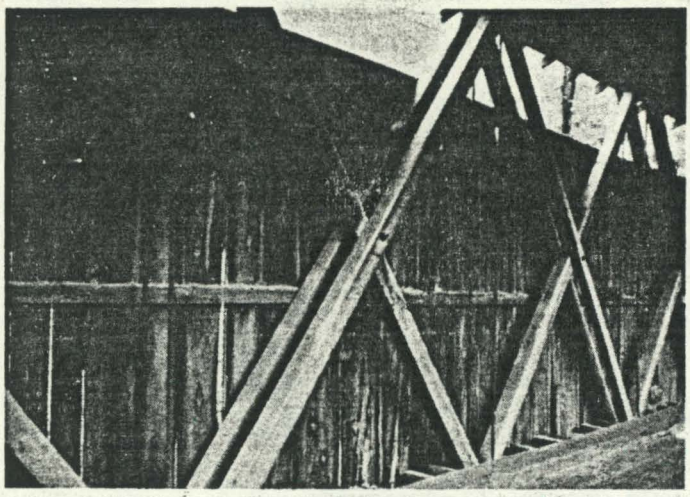
The arches rested on skew backs (inclined supports) bearing directly on the masonry abutment. The weather boarding was carried down to protect the portion of the arch below the bridge floor framing. This accounts for the haunched appearance of Burr arch-truss bridges. Because of the difficulty of keeping this area dry due to direct contact with masonry, distress in the arch bearing seat is common.

Lattice made truss

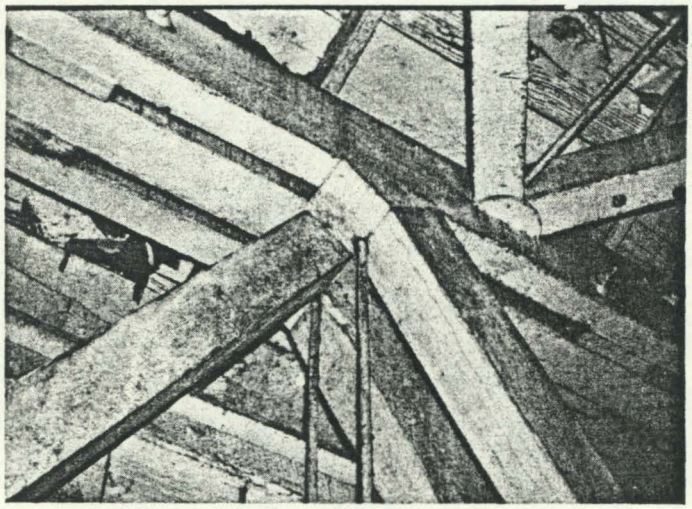
Even in the early 1800's, men with the skill and ability to frame big timbers weren't all that common; nor was the considerable work force always available to manhandle the pieces into place. So the search for alternate systems went on. In 1820, Ithiel Town, a Connecticut architect, patented a much simpler type of framing—the lattice truss. Town's "lattice mode," as he called it, had a web system consisting of a series of criss-crossed planking, pinned together and to the chords at every opportunity with hardwood pegs. There seems to be no record of any earlier design similar to this idea, in all the years before, so Town's truss was pure invention, not an improvement of a previous scheme.

Easier to lay out and frame than the Burr arch-truss, the lattice mode could be handled by an average carpenter gang. About the only problem encountered was boring all the holes for the wooden treenails that pinned the pieces together. An average 100 ft (30.50 m) span Town bridge had about 2600 holes—quite a job with a hand auger. The pins were usually turned on a lathe, although some were shaped by hand with axe or hatchet. It was considered good practice to soak the pins in oil before driving.

Town claimed his truss could be "built by mile, and cut off by the yard," making it particularly suitable to multiple span structures. It avoided the special care required to fit each span individually. No attempt was made to use smaller sized material for members in areas of lower stress. In fact, up to this point in time, no proper evaluation of member stress was made, the ability to do so simply did not exist. Any savings of material realized in doing so would likely have been lost in the complication of framing and erection that would have resulted from the use of varying sizes. Heavier loads and longer spans were accomplished by doubling and even tripling the rows of planks and increasing the number of pins. Trial and error produced the rules of practice to be followed.



Howe truss: So similar to Long's that Long claimed patent infringement, but couldn't make it stick.



Howe's modification avoided tension joints in timber and simplified framing requirements by using cast iron angle blocks into which square ends of timbers were fitted.

Panel truss

The first type of wooden bridge to make any use of mathematical calculations was developed by Col. Stephen H. Long, and patented in 1830. Long's bridge was a panel truss, using wood posts and diagonals. It, too, could be framed and assembled by regular carpenter crews; and agents for both Long and Town were in constant competition. Although this type of construction was promoted heavily for the next 10 years, there are very few remaining bridges framed with Col. Long's patented truss.

Howe's truss

The reason for the rather abrupt loss of interest in the Long truss was the coming of another and improved type of framing—the Howe truss. William Howe came from a whole family of inventors, the most widely known is likely his newphew Elias for his work on the sewing machine. The truss developed by William Howe was similar to Col. Long's, so similar in fact, that Long claimed patent infringement for years. He never was able to make the claim stick, however, for Howe's modification was truly a major improvement. In it, the wooden tension verticals were replaced by iron rods. These could be adjusted with nuts and turnbuckles to keep everything snug. Tension joints in timber have always been troublesome and remain so today. Howe's avoidance of them in the truss web system represented a substantial step forward. He also simplified the framing requirements by using cast iron angle blocks into which the square ends of timbers were fitted.

The simplification of the diagonal web connection made the use of varying sized web members easy and practical. In addition, the truss member arrangement permitted a complete stress analysis. Finally, here was a kind of framing that could be investigated mathematically. For that ability we are indebted to Squire Whipple, a New York surveying instrument maker and consulting engineer. In 1847, his book, "A Work On Bridge Building," changed bridge building from a trade to a profession, although it took many years for the importance of his contribution to be realized. In his words, ". . . no previous attempt had been successfully made to reduce Truss-Bridge construction to its simplest elements, and to determine by exact calculations, the forces acting upon the various parts of such structures and to deduce thence the proper sizes and proportions of such parts, upon known and reliable principles."

Timber bridges for canals

In the years before the railroads, bulky freight was best moved by canal barge. The canal era in our history was launched with the completion of the Erie Canal in 1825. Canal construction required the use of bridges—aqueducts to carry the waterway over stream beds or other geographic features. By 1840 there were 3,200 miles (5,122 km) of working canals, so covered aqueducts were built in some profusion. Only one remains, at Metamora, Indiana. A timber trough, suspended on iron rods from the regular Burr arch framing carries the Whitewater canal in an 83 ft (25.32 m) span over Duck Creek. This structure was originally built in 1846. Restored and rebuilt one hundred years later, the original arches are still in use.

Timber bridges for railroads

The railroads put the canals out of business by the end of the Civil War, but in so doing made great demands on the skill and ingenuity of the bridge builders. The expanding railroads needed thousands of bridges to carry the tracks into new territory. Howe truss bridges were popular for both rail and highway use. Almost any locally obtained wood could be used—white oak, pine, fir, hemlock or cedar. The timber portions of Howe trusses were often precut by crews of men sent into the woods along the right of way. The trees were felled and timbers hewn out with broad axes. Leaving the squared timbers to season, the timber crews moved on to be followed by the framing crews—auger and chisel men. When the masonry abutments were ready, a third crew, with a flat car carrying the rods, nuts, bearing blocks, bolts and other iron parts arrived to erect the span. Accounts exist of 100 ft (30.50 m) Howe truss spans being put in place in 24 hours. Once the main structure was installed, the erection crews moved on. leaving the work of shingling and siding to yet another set of specialists.

Timber covered bridges continued to be economical on U. S. railroads until the late 1800's. Fletcher and Snow, in their paper, "A History of the Development of Wooden Bridges," published in 1932, report that as late as 1890, lattice bridges could be built with $18 per thousand board foot ($7.73/m³) spruce lumber at about half the cost of iron bridges. This would be true for trains no heavier than Coopers E-40 loading and spans up to 200 ft (61 m). As the cost of steel came down and the rail loadings went up, covered

bridges for railroad use were phased out. Only a few remain, on branch lines in New Hampshire and Vermont.

Timber bridges for highways

For highway construction, covered timber bridges continued to be practical some years past the coming of the automobile. In areas favorable to timber—that is with good economy and availability, new covered bridges were built as late as 1917. Generally, covered bridges were built at right angles to the streams. The shortest span possible. With horse drawn vehicles, cautioned to cross at no faster than a walk under penalty of fine, a sharp turn at the end of a bridge didn't matter. Increasing highway speeds of autos made such sharp turns at one or often both ends of bridges very unsafe and undesirable. The changing economy of timber vs. steel truss framing was also a factor in new construction. Many old bridges were bypassed in highway realignments and other modernizations. More and more were destroyed or lost to floods, fire, vandalism or just plain lack of attention. Our whole way of life was speeding up—changing from rural to urban. These picturesque symbols of by-gone days were rapidly disappearing from the countryside.

Although the covered bridge era is past, interest in them as a part of the national heritage remains high. This should be especially so to civil engineers—for a significant role in the beginnings of our profession was played by the men who built America's covered bridges.

Donald O. Barth has spent over 20 years in various engineering, production and management positions related to the design and manufacture of glued laminated structural timber. He often lectures on the history of wooden bridges.

Alaska's native log bridges

Possibly the earliest bridge to serve mankind, the native log bridge still is important. Several thousand bridges of this type carry heavy logging trucks in Alaska and remote areas of the lower 48 states.

FRANK W. MUCHMORE, M.ASCE, P.E.
Structural Engineer
U.S. Forest Service
Juneau, Alaska

ROGER L. TUOMI, Aff.M., P.E.
Research General Engineer
U.S. Forest Service
Madison, Wisconsin

WITHIN THE LAST 20 years, several thousand bridges have been built with native logs in Southeast Alaska alone. This is part of the National Forest transportation system.

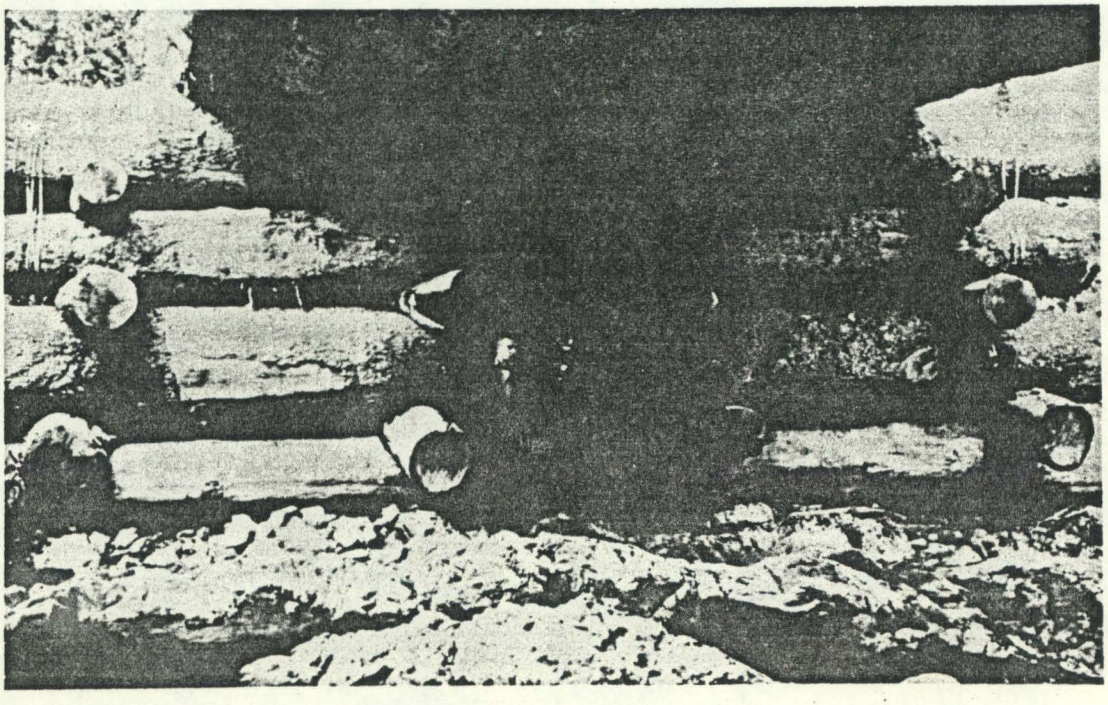
Bridges were needed to span streams, and an abundance of high-quality spruce logs, up to 5 ft (1.52 m) in diameter, was available locally. Thus bridges cost about $70 per linear foot when made with trees cut in the proximity of the site.

Although this appears like a primitive technique, the several thousand bridges of this type currently in use function adequately for up to 10 years or more. Some bridges are built with clear spans approaching 100 ft (30.5 m) and carry logging trucks with weights exceeding 100 tons (90,720 Kg).

Bridge safety

Following the 1967 "Silver Bridge" disaster, Congress passed the Federal Aid Highway Act which established national bridge inspection standards. Bridges on Federal and Federal-aid roads must be inspected at intervals not to exceed 2 years.

Unfortunately, current knowledge of log stringer bridge analysis and design is limited. Little is known about the bending strength of large-diameter logs. The recommended allowable design stresses are based on procedures developed for



Log crib abutments and bottomside of log stringer structure. Logs are not sawn into timbers and planks, but are placed butt-to-tip on log crib abutments and tied together with cables. Blast rock is placed on the logs and bladed to provide a running surface. Brow logs are placed at the sides of the bridge to serve as curbs and guardrails.

STATE OF VERMONT

AGENCY OF DEVELOPMENT AND COMMUNITY AFFAIRS

OFFICE OF THE SECRETARY (802) 828-3211 MONTPELIER, VERMONT 05602

DEPARTMENTS OF:
Economic Development 828-3221
Housing & Community Affairs 828-3217

DIVISIONS OF:
Administration 828-3231
Historic Preservation 828-3226
Vermont Travel Division 828-3236
Vermont Life Magazine 828-3241

May 9, 1980

Ms. Naomi Stokes
1520 S.E. 11th Avenue
Portland, Oregon 97214

Dear Ms. Stokes:

Your letter to the Vermont State Chamber of Commerce in regard to covered bridges has been referred to this Division for reply.

Vermont has presently remaining approximately 100 covered, wooden highway bridges, most of which are still in use, and three covered railroad bridges, one of which is still in daily use.

Vermont is presently in the middle of a statewide program of restoring over 70 of its covered bridges which are in need of work. The program cost will be approximately $1 million with 80 percent funding provided by the State, ten percent by the towns in which the bridges are located, and ten percent by the State Division for Historic Preservation through its Federal preservation funding program.

It is worthy of note that in the past 12 years, Vermont has not lost any covered bridge through demolition and has lost only one as a result of a tornado. Our most recent authentic covered highway bridge was built in Woodstock, Vermont in 1969 by Milton S. Graton of Ashland, New Hampshire. Mr. Graton has also worked on the restoration of a number of historic bridges.

To our knowledge, Mr. Graton is the last of the great covered wooden bridge builders. His book, The Last of the Covered Bridge Builders, would be an invaluable reference for you in connection with the publication you are considering. It can be obtained by writing to him in Ashland, New Hampshire.

Sincerely,

DIVISION FOR HISTORIC PRESERVATION

William B. Pinney

William B. Pinney
Director

WBP/cjd

P.S. All of Vermont's historic covered bridges are included in the National Register of Historic Places.

Vermont
STATE CHAMBER OF COMMERCE

Mailing Address: Box 37 Montpelier, Vt. 05602 802/223-3443 229-0154
Office: Intersection I-89 Access Rd. & Airport Rd., Berlin, Vt.

5/8/80

Dear Bill,

Can you help us with this one?

Trena

Shatney

Rutland Town
has off water
covered bridge

NAOMI M. STOKES
Writing • Photography

1520 S.E. 11th Avenue
Portland, Oregon 97214

(503) 232-9070

May 2, 1980

Public Relations Dept. Director
VERMONT STATE CHAMBER of COMMERCE
P. O. Box 37
Montpelier, Vermont 05602

Dear Sir:

I am writing a book on the fast-vanishing covered bridges of Oregon and in connection with my research have been told that Vermont, rather than letting these works of art rot and be destroyed, has instituted a program of salvage and restoration.

My informant stated that Vermont has gone as far as to look up some of the still-living old builders in order to use their knowledge and skills, not only for the restoration of old bridges, but for the building of new covered bridges.

If this is true, the information should be included in my book as an example of what one state is doing to preserve these beautiful landmarks.

I would appreciate any information whatever regarding the covered bridges of Vermont and am enclosing a stamped self-addressed envelope for your convenience in replying.

Yours sincerely,

Naomi M. Stokes

Naomi M. Stokes

enc.

prepared by EB for Gov. Statement
5/9/80

Covered bridges represent an excellent solution to the problem of providing permanent river crossing facilities made of local materials. In the late nineteenth century, they were common across the eastern half of the United States. The recognition of their continuing usefulness, their durability and beauty by Vermonters, both recently and in the past, has resulted in many of these fine structures being cared for and preserved.

Vermont has recognized the importance of its covered bridges (only one state may have more) by placing all of Vermont's nearly 100 remaining historic covered bridges on the National Register of Historic Places, thereby recognizing their importance to our local, state and national heritage.

The State Agency of Transportation and the Agency of Development and Community Affairs, through the Division for Historic Preservation, is cooperating with towns across the state in restoring and repairing 61 town-owned bridges at a cost in excess of $1 million. With their carefully fitted heavy timber structural systems protected from the elements, covered bridges will continue to be quiet reminders of the ingenuity that went into their construction while still serving a useful purpose and adding significantly to the pleasure of enjoying the unique Vermont environment.

STATE OF VERMONT

AGENCY OF DEVELOPMENT AND COMMUNITY AFFAIRS

OFFICE OF THE SECRETARY (802) 828-3211 MONTPELIER, VERMONT 05602

DEPARTMENTS OF:
Economic Development 828-3221
Housing & Community Affairs 828-3217

DIVISIONS OF:
Administration 828-3231
Historic Preservation 828-3226
Vermont Travel Division 828-3236
Vermont Life Magazine 828-3241

August 23, 1978

Ms. Linda Ray Wilson, Director
NH Historic Preservation Office
P.O. Box 856
Concord, New Hampshire 03301

Dear Ms. Wilson: Linda

Thanks very much for sending me Chapter 243 of your Acts relating to covered bridges. We are particularly interested in the portion of financial assistance carried by the state on town bridges and from the material you sent me, I believe that funding is covered under Chapter 242 RSA. I would appreciate it very much if you would send me a copy.

With best personal wishes,

DIVISION FOR HISTORIC PRESERVATION

Bill Pinney

William B. Pinney
Director/State Historic Preservation Officer

WBP/cjd

State of New Hampshire
Department of Resources & Economic Development
HISTORIC PRESERVATION OFFICE
Box 856
Concord, New Hampshire 03301
603-271-3483

George Gilman, Commissioner
State Historic Preservation Officer

August 1, 1978

Mr. William B. Pinney, Director
State Historic Preservation Office
Historic Sites Division
Montpelier, Vermont 05602

Dear Mr. Pinney:

Some time ago you requested a copy of the New Hampshire statutes relating to the preservation and maintenance of covered bridges. I regret that I am only now able to provide the information you were seeking.

Enclosed is a copy of New Hampshire Revised Statutes Annotated (RSA) 243, "Rehabilitation of Covered Wooden Bridges." Also enclosed is a summary listing of New Hampshire legislation affecting cultural resources.

I hope that this material will be helpful; and I especially hope that it did not arrive too late!

With apologies,

Linda Ray Wilson

Linda Ray Wilson, Director
NH Historic Preservation Office

LRW:bf

enclosures

cc: Commissioner George Gilman, NH SHPO

CHAPTER 243

REHABILITATION OF COVERED WOODEN BRIDGES

ANNOTATIONS

Library references

Bridges ⇨ 21(1-8), 22. CJS Bridges §§ 36-42.

243:1 Public Works and Highways Department; Authorization. The public works and highways department is hereby authorized to assist in the rehabilitation of existing wooden covered bridges upon the state secondary and town road systems in the proportions set forth under sections 9 and 10 of chapter 242, RSA, for the following purposes:

(a) Replacing of floor beams and reflooring.

(b) Reroofing.

(c) Repair or replacement of truss members and/or wooden arch members.

(d) Replacement or repairs of piers, abutments and wing walls.

HISTORY

Source. 1953, 184:1, eff. May 28, 1953.

Demolition. 1963, 96:1, 2, eff. July 23, 1963, provided:

"**96:1 Hearing.** In the event that the demolishing of a wooden covered bridge is being considered, the officials responsible for such bridge shall provide for a public hearing by the state historical commission where all facts pertaining to the preservation or demolition of such bridge may be presented.

"**96:2 Notice of Hearing.** The notice of the public hearing shall be posted fourteen days in advance of said hearing and shall be advertised in a newspaper of general circulation in the area in which the bridge is located."

243:2 Carrying Capacity of Bridge. No funds shall be expended unless such bridge may be rehabilitated to a carrying capacity of at least six tons.

HISTORY

Source. 1953, 184:2, eff. May 28, 1953.

243:3 Limitation on Expenditures. The total amount that may be expended on any bridge under this chapter for the above purposes shall in no instance exceed the estimated sum that might be necessary for the construction or reconstruction of a bridge under sections 3, 9 and 10 of chapter 242, RSA.

HISTORY

Source. 1953, 184:3, eff. May 28, 1953.

243:4 Maintenance. Any bridge rehabilitated under this act shall be subject to the provisions of sections 19 and 6 of chapter 242, RSA.

Housing and Community Development Act of 1974 (PL 93-383), amended by the Housing and Community Development Act of 1977 (PL 95-128)

Land and Water Conservation Fund Act of 1976 (PL 94-422)

Public Buildings Cooperative Use Act of 1976 (PL 94-541)

Tax Reform Act of 1976 (PL 94-455)

Principal Agencies

Advisory Council on Historic Preservation

Council on Environmental Quality

Federal Railroad Administration

General Services Administration

US Dept. of Housing and Urban Development (and affiliated State agencies)

US Department of the Interior (and affiliated State agencies)

US Dept. of Transportation (and affiliated State agencies)

State Historic Preservation Office

Office of Comprehensive Planning

Coordinator of Federal Funds

Regional Planning Commissions

What New Hampshire legislation affects historic preservation?

Although very few of New Hampshire's Revised Statutes Annotated (RSA) are directed specifically to preservation purposes, a large number of laws (especially those relating to land use, conservation, and the powers and duties of towns) contain preservation-related provisions.

A selection of New Hampshire legislation affecting preservation:

RSA 4:8-a	Gifts for Historic Sites and Technical Institutes or Vocational-Technical Institutes
RSA 4:12-a	Coordinator of Federal Funds
RSA 7:18-a	Attorney General:Environmental Protection Division

RSA 8-B	Records Management and Archives
RSA 19-A	New Hampshire Commission on the Arts
RSA 31:4	Town Appropriations
RSA 31:19	Town Trust Funds
RSA 31:39	Powers of Towns to Make By-laws
RSA 31:51-52	Powers of Towns as to Shade and Ornamental Trees
RSA 31:60-88	Zoning Regulations (especially §62, "Purposes in View")
RSA 31:89	Authority to Establish Historic Districts
RSA 31:103	Interim Zoning Ordinance (enabling legislation)
RSA 36	Planning Boards
RSA 36-A	Conservation Commissions
RSA 36-C	Interim Zoning Ordinance (text of model ordinance)
RSA 52	Village Districts
RSA 48-A:12	Housing Standards: Exceptions for structures within Historic Districts
RSA 79-A	Current Use Taxation (includes 79-A:15, "Discretionary Easements", which are different types of easements from those described in RSA 477:45-47)
RSA 202-A	Public Libraries
RSA 203:14	Bond Issues Allowable
RSA 205:4-c	Tax Increment Financing
RSA 216-A	Expansion of State Park System
RSA 227-A	State Historical Commission
RSA 227-C	State Historic Preservation Office
RSA 243	Rehabilitation of Covered Wooden Bridges
RSA 249:38a,b,c; 39-43	Marking the Location of Public and Historic Incidents
RSA 253	Trees and Roadside Growths; Scenic Roads

149-80 Water Pollution & Disposal of Wastes: Enforcement of classifications

ADD:
483-A
Dredge and Fill in Wetlands

488-A
Excavating & Dredging in Public Waters

RSA 477:45-47	Conservation and Preservation Restrictions
RSA 498-A	Eminent Domain Procedure Act
RSA 539	Wilful Trespass
RSA 637	Theft

What is the National Register?

The National Register of Historic Places is the nation's official listing of cultural property worthy of preservation; it includes buildings, structures, objects, sites and districts significant in national, state or local history, architecture, archaeology or culture. The National Register program is jointly administered by the United States Department of the Interior and the State Historic Preservation Offices of each State, working together in a unique State and Federal partnership.

The names National Register of Historic Places, The Federal Register and The National Trust for Historic Preservation are very similar--are they different ways of saying the same thing?

No. The National Trust is a national organization chartered by Congress (see Chapter IV); The Federal Register is a daily publication of Federal executive orders, notices, regulations and publications. A cumulative list of properties in the National Register is published annually in an issue of The Federal Register, and additions to the National Register are published weekly.

What protections are afforded by National Register status? Does inclusion in the National Register affect an owner's use of the property?

National Register listing provides recognition of resources worthy of preservation, but does not impose any restriction or limitation on the use of private or non-Federal property if Federal funds or programs are not involved. National Register designation also provides for review and amelioration of potential effects which

ERIC - SHOULD SOMEONE FROM THE DIVISION GO TO THIS?

MARK YOUR CALENDAR FOR . . .

NEW ENGLAND/NEW YORK TIMBER BRIDGE CONFERENCE

JUNE 13-15, 1989
LAKE MOREY INN
FAIRLEE, VERMONT

Plan to join us for the New England/New York Timber Bridge Conference. It will broaden and upgrade your knowledge about modern alternatives for construction and maintenance of bridges. And don't forget the family!

This conference will present current information on the use, construction, and maintenance of the contemporary timber bridges. Information useful to decision-makers and engineers will be presented on the use of timber in constructing and rehabilitating highway bridges. The suitability of timber as a bridge construction material and modern concepts for use in bridge construction will be highlighted along with its benefits as a cost-effective alternative to other construction materials. Decision factors that need to be considered for the successful completion of timber bridge projects will be reviewed by officials and technical experts representing government, universities, trade associations, and the private sector.

This conference will be useful for local elected officials, highway engineers, public works managers, contractors, and forest products industry representatives. Consulting engineers wishing to learn more about timber bridge systems should also attend. Members of the forest products industry from New England/New York and the surrounding states will be interested in presentations concerning the use of local timber resources in the construction of timber bridges.

Exhibits of available commercial products are planned. In addition, each participant will receive a binder containing a wide variety of information on all aspects of timber bridge design, construction, and maintenance.

CONFERENCE TOPICS

1. Timber Bridges – Past and Present
2. Decision Factors on a Bridge Timber Project
3. Timber Bridge Impacts on Local Economies
4. Selecting a Timber Bridge System
5. Timber Culverts
6. Timber Bridge Design and Inspection
7. Timber Bridge Planning, Approval, and Construction
8. Preservative Treatment
9. Local Species in Bridge Construction
10. Specification for Design and Construction of Timber Bridges
11. Future Designs and Materials for Timber Bridges
12. Environmental/Aesthetic Concerns
13. Guardrail Design

PARTICIPATING ORGANIZATIONS

- State Forestry Agencies
- State Transportation Agencies
- Cooperative Extension Service
- USDA – Forest Service
- USDA – Office of Transportation
- USDA – Soil Conservation Service
- Technology Transfer Centers
- New England Association of RC&D Areas
- Black River – St. Lawrence RC&D Area
- Greater Adirondack RC&D Area

NEW ENGLAND/NEW YORK TIMBER BRIDGE CONFERENCE

Information on the program and accommodations will be mailed out during March, 1989. To receive it, please return this form to:

George D. Aiken
RC&D Area
38 South Main Street
Randolph, VT 05060
(802) 728-9526

NAME AND TITLE: _____

ORGANIZATION: _____

MAILING ADDRESS: _____

_____ **TELEPHONE** _____

COVERED BRIDGES IN VERMONT

ADDISON COUNTY

Middlebury	Halpin Covered Bridge
	Pulp Mill Covered Bridge
Shoreham	East Shoreham Covered Railroad Bridge
West Salisbury vicinity	Cedar Swamp Covered Bridge

BENNINGTON COUNTY

Arlington	Arlington Green Covered Bridge
Bennington vicinity	Bennington Falls Covered Bridge
Bennington vicinity	Henry Covered Bridge
Bennington vicinity	Silk Covered Bridge

CALEDONIA COUNTY

Danville vicinity	Greenbanks Hollow Covered Bridge
Lyndon	Chamberlin Mill Covered Bridge
Lyndon	Old Schoolhouse Bridge
Lyndon vicinity	Bradley Covered Bridge
Lyndon vicinity	Burrington Covered Bridge
Lyndon vicinity	Centre Covered Bridge

CHITTENDEN COUNTY

Charlotte vicinity	Holmes Creek Covered Bridge
East Charlotte vicinity	Quinlan's Covered Bridge
East Charlotte vicinity	Sequin Covered Bridge

FRANKLIN COUNTY

East Fairfield	East Fairfield Covered Bridge
Enosburg	Hopkins Covered Bridge
Fairfax	Fairfax Covered Bridge
Highgate Falls vicinity	Douglas & Jarvis Patent Parabolic Truss Iron Bridge
Montgomery	Comstock Covered Bridge
Montgomery	Fuller Covered Bridge

COVERED BRIDGES IN VERMONT

FRANKLIN COUNTY (Con't)	
Montgomery Center vicinity	Hectorville Covered Bridge
Montgomery Center vicinity	Hutchins Covered Bridge
Montgomery vicinity	Longley Covered Bridge
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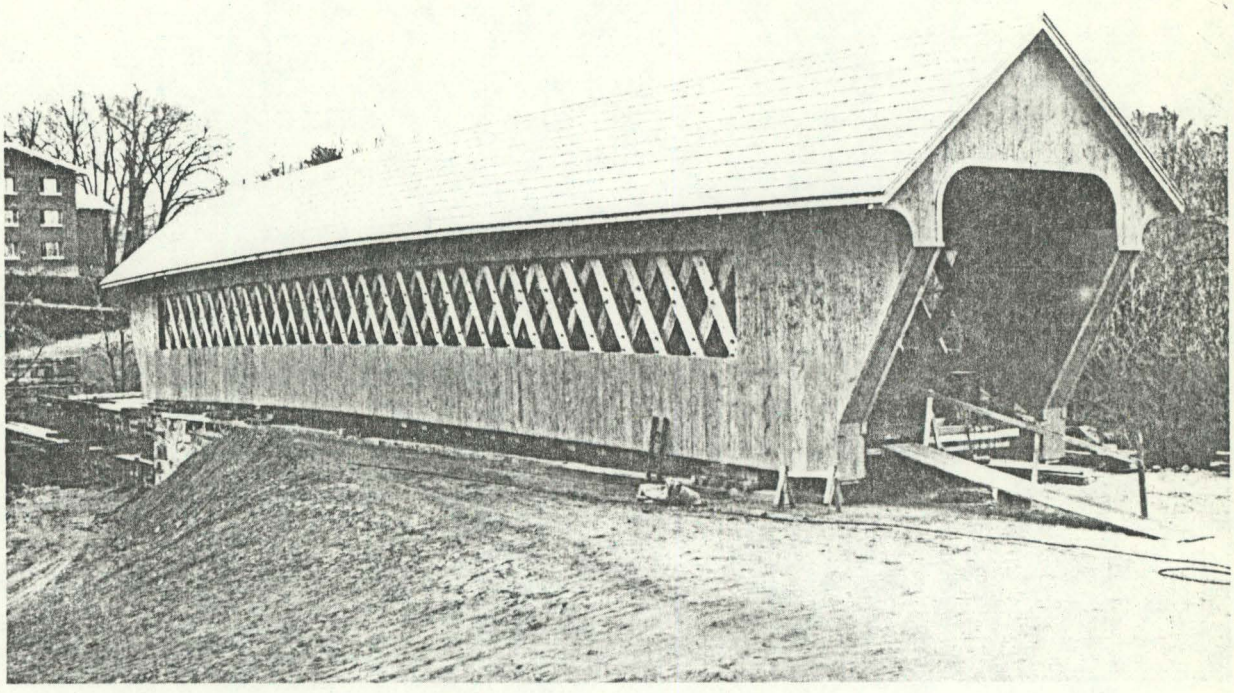
Woodstock vicinity	Taftsville Covered Bridge

THE OLD COVERED BRIDGE AT SHELDON BEFORE THE FIRE IN 1932

SB2



HOW TO BUILD A COVERED BRIDGE

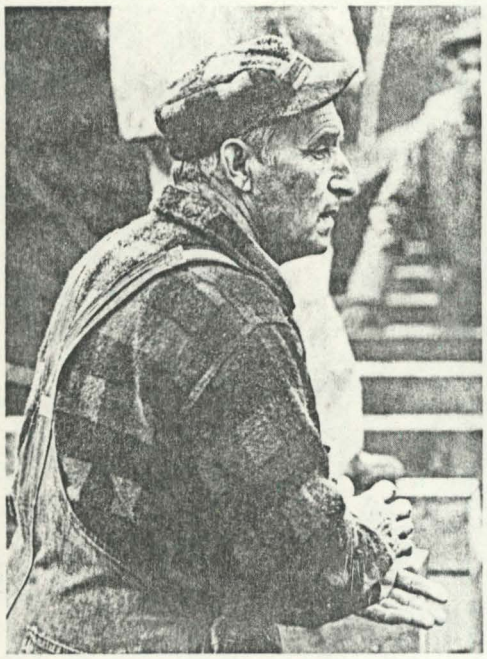
by Leo Callahan

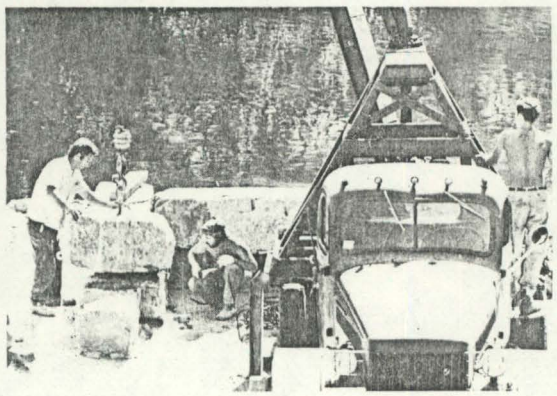
IF you want to build yourself an authentic 19th century wooden covered bridge, don't bother to look around for a copy of "101 Easy Steps to Building A Covered Bridge." There's not a library shelf anywhere holding such a book because no such edition has ever been printed.

But all the facts, figures and know-how are readily available. All you have to do is travel to Ashland, and look up the father-son bridge-building team of Milton S. and Arnold Graton.

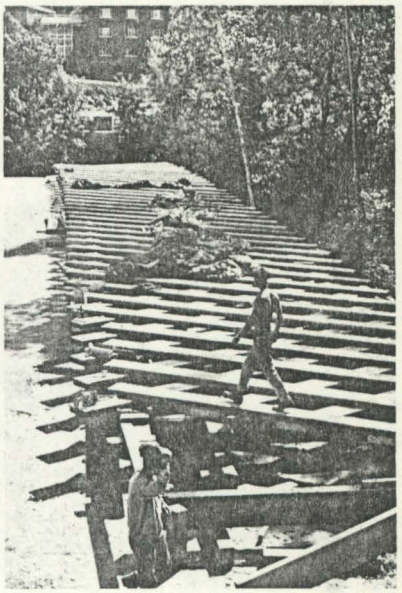
The Gratons are recognized as the last known builders of authentic covered bridges in America and last May 13 put the finishing touches to their latest anachronism in wood, a 150-foot Town Lattice covered bridge that now stretches across the Contoocook River on the New England College campus in Henniker.

(below) Master bridge builder Milton Graton and his son, Arnold, right.





(below left) One of the first tasks in the New England College/Henniker project was constructing the bridge abutments on the Contoocook River. (below) East side Town Lattice truss assembled at the site, view is of the outside of the 19 ton unit.



The 90-ton bridge cost $80,000, and took a year to erect. It was completely hand crafted and fitted by the Gratons with the touch of a 20th century Michaelangelo.

A craftsman with a deep fondness for math, Milton Graton, 63, has surprisingly only been in the covered bridge business since 1959. He didn't plan it that way. It just happened and he says it indirectly came about because of tight finances and a flood.

Graton came to New Hampshire from Willimantic, Conn., to work as a grader operator on a road gang.

"I was accepted at Norwich University in 1927, but when fall came I didn't have any money so I went to work," he said. "In 1930, I ended up in New Hampshire. I liked what I saw so when the job finished I decided to stay on."

In 1936, after spending slightly more than five years hauling logs on a lumber crew supervised by former governor Sherman Adams, who in later years became assistant to President Dwight D. Eisenhower, Graton got his first taste of a brand of engineering that led to his eventual love affair with covered bridges.

"In '36, the Pemigewasset River overflowed and washed a house in Holderness off its foundation and left it in the middle of the road," Graton said. "I was asked if I could move it and I figured I'd give it a try. That's how I got started in the moving and rigging business. After that, I worked moving buildings and during the war years I concentrated on problem construction for various contractors."

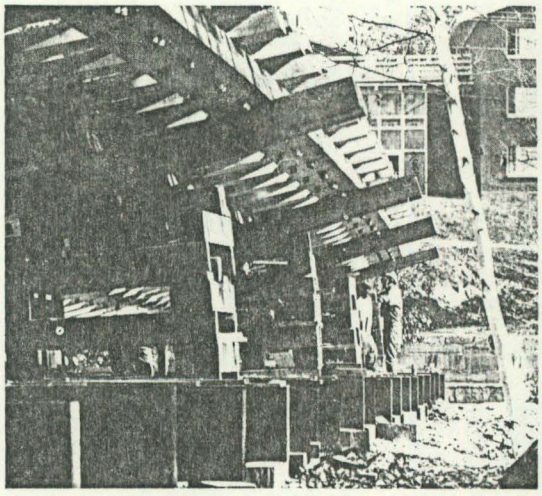
By 1947, Graton was operating his own moving and rigging business and in 1959 he got his first call to move a covered bridge.

"We moved a few bridges for the Army Corps of Engineers over in Vermont," Graton recalled. "Then we got a call to move the 132-foot covered bridge in Lyndonville, Vt., which was about 100 years old. A new road was being put through and we had to haul the bridge off the river, move it about a mile up the road and put it back across the river. That was 13 years ago and ever since we've been involved almost exclusively with covered bridges in one way or another."

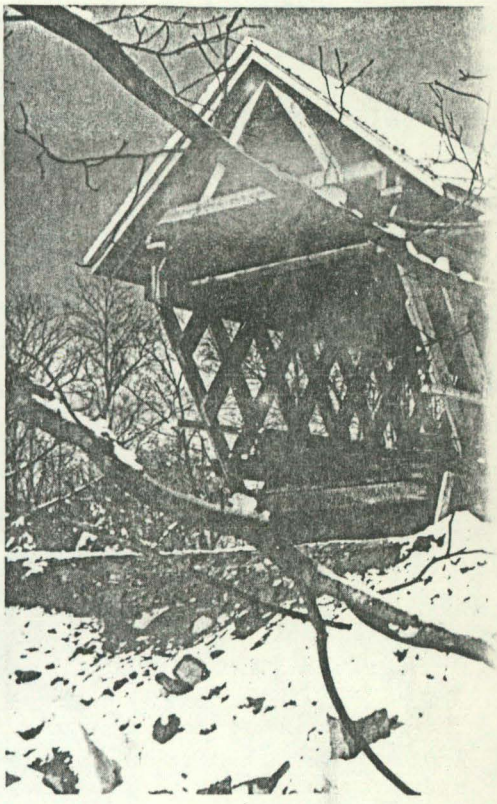
Arnold Graton, 35, the eldest of the three Graton sons, has been a bridge builder since he graduated from high school. Together he and his father form Graton Associates, Inc., and handle the bulk of the work alone.

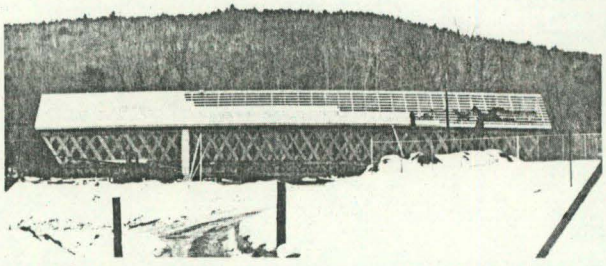
"You have to keep it down to a small operation in order to control the quality of the work," Graton notes.

Photographs by Barry Proctor and Tim Savard

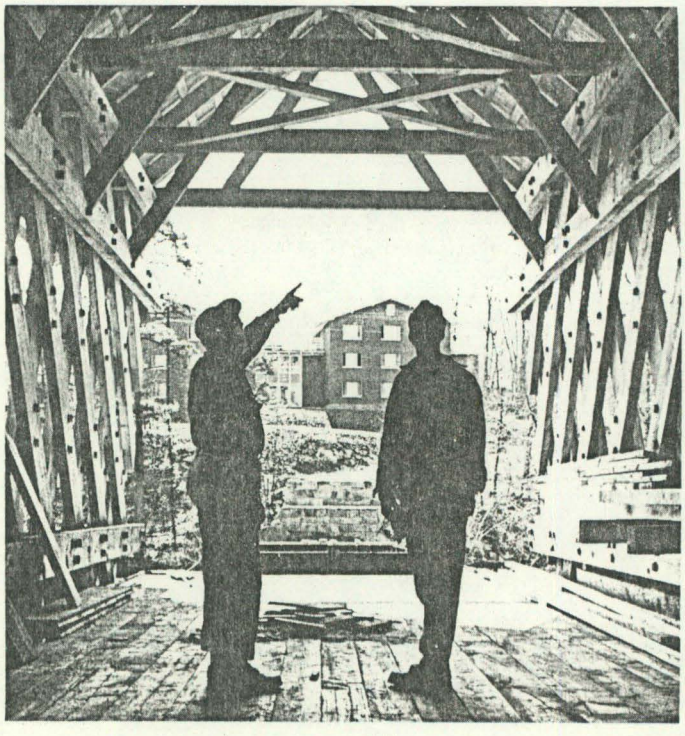


Truss in process of being jacked to standing position. When it was erect, it was braced and construction of the second truss began.

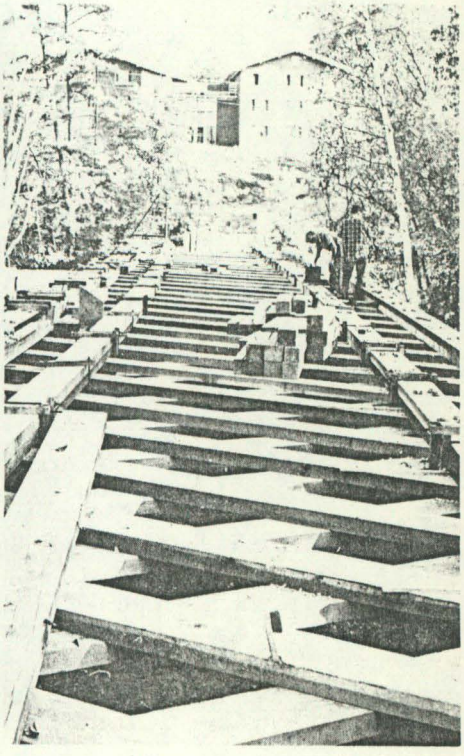




Bridge at the half-way point in construction.



The Gratons check roof construction details.



Inside of west side truss facing up. Compare with construction features shown in truss picture on previous page.

View of the west portal photographed from north bank of river.

In 13 years, Graton Associates, Inc. has left a trail of covered bridge restorations throughout the east, with the vast majority being done in New Hampshire and Vermont.

When New England College decided to construct an authentic covered bridge, it wasn't hard to find the builder. "The Gratons are the ones," college officials were told, "they're the only ones who can handle the job." The Gratons started the New England College/Henniker bridge in May, 1970 and everything about it is authentic.

Made entirely of wood, the span was the first authentic covered bridge in New Hampshire in more than 100 years and the scene was something out of the 1800's, right down to the team of oxen used to drag the bridge across the river's narrows.

NEC/HENNIKER COVERED BRIDGE

Facts and Figures

The Bridge spans the Contoocook River

Bridge Type: Town Lattice
Length: 150′
Clear Span: 124′
Weight: 90 tons
Clear Height: 14′ 4″
Clear Width: 14′ 4″
Wood Used: 71,000 board feet
Nails Used: 800 lbs.

TIMBER:

Five types of wood were used in the bridge: Douglas Fir, Hemlock, White Oak, Cedar and Pine.

The two trusses and the floor joists were fashioned from 53,000 board feet of Douglas Fir from Oregon. A shipment of 47,000 board feet arrived by rail directly from the west coast and 6,000 board feet was purchased locally.

The flooring was fashioned from 5,000 board feet of native hemlock. Four-inch planks were used.

The portions of the floor which feel the wear of auto wheels was made from 4,000 board feet of native oak. Four-inch planks were used.

The rafters were made from 5,000 board feet of native spruce.

The shingles for the roof are half-inch white cedar from northern Maine. Each shingle is three feet long and it took 48 squares of shingles to cover the roof. One square measures 10′ x 10′.

To board-up the bridge sides, 4,000 board feet of old-growth native pine was used.

TOWN LATTICE TRUSSES:

The bridge has two trusses, each weighing 19 tons. There were 140 full pieces used in both trusses. Each piece is 24 feet long, with 70 pieces measuring 3½″ x 12″ x 24′ and 70 pieces measuring 3½″ x 14″ x 24′.

The Town Lattice was first developed in 1820 by Ithiel Town of New Haven, Conn. The truss, made up of criss-crossing planks is one of the most efficient ever used in covered bridges.

TRUNNELS:

Trunnels, or tree nails, are huge wooden dowels used to tie together the lattice work, as well as roof and floor chords.

The trunnels in the NEC/Henniker bridge were made from native white oak. A total of 1,080 were used. All trunnels measure two inches in diameter. Three lengths were used:

27 ½″ — 200 were used below the floor.
24″ — 600 were used in the roof, floor and intermediate chords.
11″ — 280 were used in the lattice work.

ABUTMENTS:

Approximately 400 granite blocks of various sizes (18″ x 18″ x 4′ up to 18″ x 18″ x 8′) were used in the two abutments. The 200 tons of granite came from two covered bridge abutments and an old railroad bridge abutment further downstream. The bridges have long since vanished but the abutments remained, a mute monument to another day.

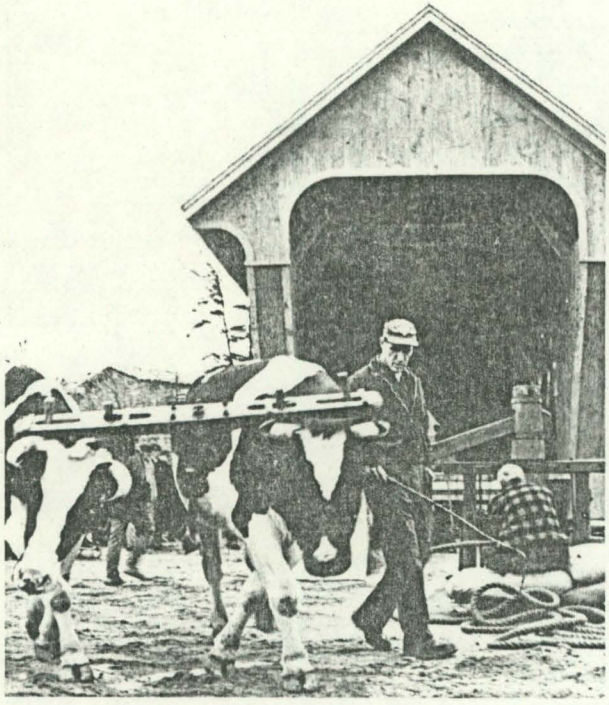
MISCELLANEOUS:

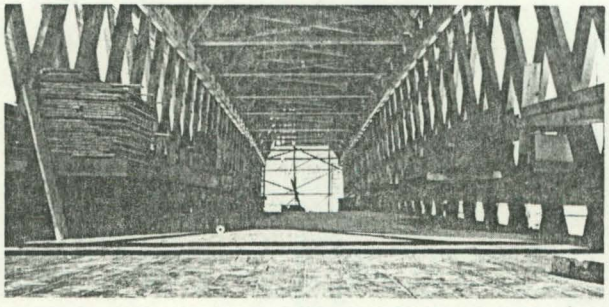
The bridge sits 20 feet above low water.

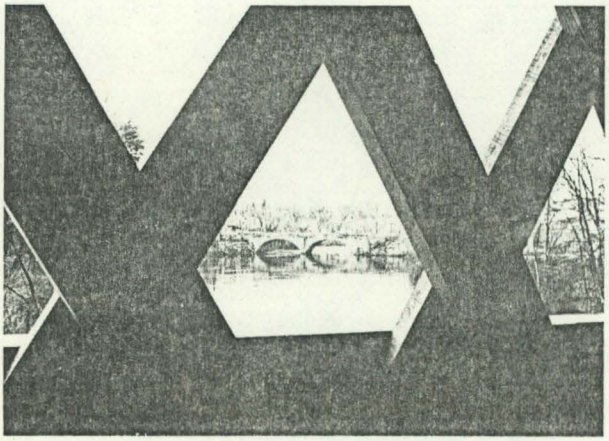
The largest single timber in the bridge measures 3½″ x 14″ x 42′. It is a chord member. There are eight such timbers in the bridge.

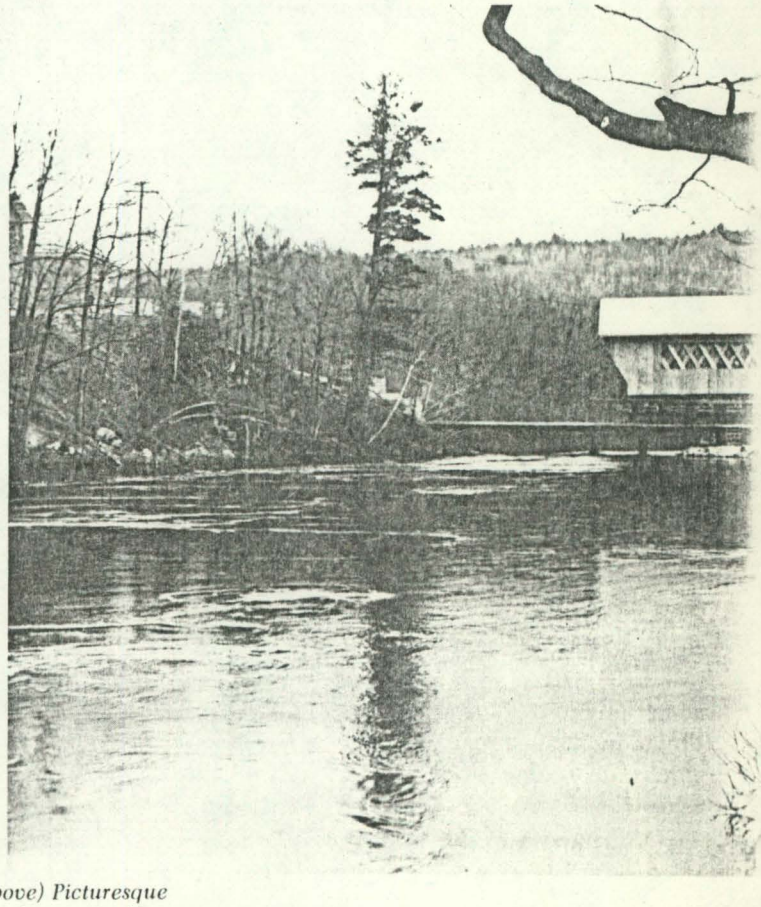
Nails were used for flooring, shingles and side boarding. The floor holds 400 pounds of nails.

To keep the project as authentic as possible, Donald Crane of Washington and his team, Stars and Stripes, turned the winch to pull the bridge across the river. The NEC football team (right) also took a few turns on the winch.



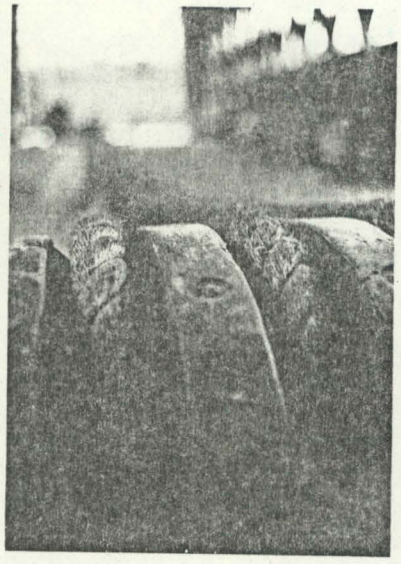




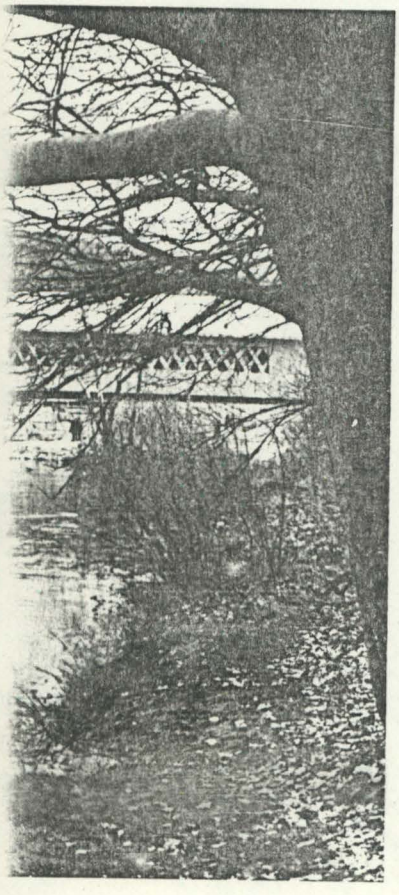


(middle above) Interior of the bridge from the south portal. (above) Picturesque stone arch bridge, 600 yards downstream, was the only way of crossing the river to reach both old and new campuses. (right) The completed bridge reaches the halfway point in its trip across the river.

This block and tackle was used to pull the bridge across the Contoocook.



The first pedestrians to cross the bridge on dedication day, May 13, 1972.



The two Town Lattice trusses, each weighing 19 tons, were fashioned on the north bank of the Contoocook from 47,000 board feet of Douglas fir shipped by rail from Oregon during the first week of June, 1971. Following eight weeks of curing, work on the first truss began, and one month later it was standing tall waiting for its mate to rise.

The Town truss, first developed and patented in 1820 by Ithiel Town of New Haven, Conn., is made up of criss-crossing planks and is considered one of the most efficient and durable ever used in covered bridges.

Perhaps the most unique aspect of the bridge lies in the fact that huge wooden pins or dowels called trunnels were used to lock the lattice work and supporting timbers in place. Trunnel is a corruption of the two words "tree nails," and 1,080 were put in the New England College/Henniker bridge.

With the exception of the roof framework, which was assembled in Graton's Ashland workshop, the entire bridge was built on the river's north bank from a total of 71,000 board feet of Douglas fir, hemlock, white oak, cedar and pine.

The two abutments were constructed from 400 granite blocks weighing approximately 200 tons. The granite was moved from further downstream where a covered bridge and a railroad bridge once stood. The bridges have long vanished but their abutments remained, a mute monument to another day.

"We've taken apart a lot of old bridges and the work of those old builders was flawless," Milton Graton said. "I guess I feel about wood the same way they did. I'm fond of wood and anything that's old, too, from a mummy case right down to a packing crate."

And as he spoke of covered bridges and his work, Graton passed a confident hand across a timber. "A man who can't communicate with a piece of wood better leave it alone," he said.

And looking at his bridge, you know there's no language barrier.

Covered bridges represent an excellent solution to the problem of providing permanent river crossing facilities made of local materials. In the late nineteenth century, they were common across the eastern half of the United States. The recognition of their continuing usefulness, their durability and beauty by Vermonters, both recently and in the past, has resulted in many of these fine structures being cared for and preserved.

Vermont has recognized the importance of its covered bridges (only one state may have more) by placing all of Vermont's nearly 100 remaining historic covered bridges on the National Register of Historic Places, thereby recognizing their importance to our local, state and national heritage.

The State Agency of Transportation and the Agency of Development and Community Affairs, through the Division for Historic Preservation, is cooperating with towns across the state in restoring and repairing 61 town-owned bridges at a cost in excess of $1 million. With their carefully fitted heavy timber structural systems protected from the elements, covered bridges will continue to be quiet reminders of the ingenuity that went into their construction while still serving a useful purpose and adding significantly to the pleasure of enjoying the unique Vermont environment.

Free Press Special Photo by DAVE GOSKA

Bridge Facelift

Workers complete a $35,000 rehabilitation project of the Mill Bridge in Tunbridge. A new abutment and floor beams are being installed and ice-damaged boarding replced. The bridge is one of 62 of the state's historic covered bridges being repaired under a two-year Transportation Agency program.

COVERED BRIDGES IN VERMONT

ADDISON COUNTY

Middlebury	Halpin Covered Bridge
	Pulp Mill Covered Bridge
Shoreham	East Shoreham Covered Railroad Bridge
West Salisbury vicinity	Cedar Swamp Covered Bridge

BENNINGTON COUNTY

Arlington	Arlington Green Covered Bridge
Bennington vicinity	Bennington Falls Covered Bridge
Bennington vicinity	Henry Covered Bridge
Bennington vicinity	Silk Covered Bridge

CALEDONIA COUNTY

Danville vicinity	Greenbanks Hollow Covered Bridge
Lyndon	Chamberlin Mill Covered Bridge
Lyndon	Old Schoolhouse Bridge
Lyndon vicinity	Bradley Covered Bridge
Lyndon vicinity	Burrington Covered Bridge
Lyndon vicinity	Centre Covered Bridge

CHITTENDEN COUNTY

Charlotte vicinity	Holmes Creek Covered Bridge
East Charlotte vicinity	Quinlan's Covered Bridge
East Charlotte vicinity	Sequin Covered Bridge

FRANKLIN COUNTY

East Fairfield	East Fairfield Covered Bridge
Enosburg	Hopkins Covered Bridge
Fairfax	Fairfax Covered Bridge
Highgate Falls vicinity	Douglas & Jarvis Patent Parabolic Truss Iron Bridge
Montgomery	Comstock Covered Bridge
Montgomery	Fuller Covered Bridge

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Bennington vicinity	Henry Covered Bridge
Bennington vicinity	Silk Covered Bridge

CALEDONIA COUNTY

Danville vicinity	Greenbanks Hollow Covered Bridge
Lyndon	Chamberlin Mill Covered Bridge
Lyndon	Old Schoolhouse Bridge
Lyndon vicinity	Bradley Covered Bridge
Lyndon vicinity	Burrington Covered Bridge
Lyndon vicinity	Centre Covered Bridge

CHITTENDEN COUNTY

Charlotte vicinity	Holmes Creek Covered Bridge
East Charlotte vicinity	Quinlan's Covered Bridge
East Charlotte vicinity	Sequin Covered Bridge

FRANKLIN COUNTY

East Fairfield	East Fairfield Covered Bridge
Enosburg	Hopkins Covered Bridge
Fairfax	Fairfax Covered Bridge
Highgate Falls vicinity	Douglas & Jarvis Patent Parabolic Truss Iron Bridge
Montgomery	Comstock Covered Bridge
Montgomery	Fuller Covered Bridge

COVERED BRIDGES IN VERMONT

FRANKLIN COUNTY (Con't)

Montgomery Center vicinity	Hectorville Covered Bridge
Montgomery Center vicinity	Hutchins Covered Bridge
Montgomery vicinity	Longley Covered Bridge
Montgomery vicinity	West Hill Covered Bridge
Swanton vicinity	Swanton Covered Railroad Bridge

LAMOILLE COUNTY

Belvidere	Mill Covered Bridge
Belvidere	Morgan Covered Bridge
Cambridge	Gates Farm Covered Bridge
Cambridge	Grist Mill Covered Bridge
Cambridge Junction	Poland Covered Bridge
Johnson	Power House Covered Bridge
Johnson vicinity	Scribner Covered Bridge
Johnson vicinity	Waterman Covered Bridge
Morristown vicinity	Red Covered Bridge
Stowe vicinity	Gold Brook Covered Bridge
Waterville	Village Covered Bridge
Waterville vicinity	Jaynes Covered Bridge
Waterville vicinity	Montgomery Covered Bridge
Wolcott vicinity	Fisher Covered Railroad Bridge

ORANGE COUNTY

Chelsea vicinity	Moxley Covered Bridge
East Randolph vicinity	Gifford Covered Bridge
East Randolph vicinity	Kingsbury Covered Bridge
North Tunbridge	Larkin Covered Bridge
Randolph vicinity	Braley Covered Bridge
Thetford	Thetford Center Covered Bridge
Tunbridge	Mill Covered Bridge

COVERED BRIDGES IN VERMONT

ORANGE COUNTY (Con't)	
Tunbridge vicinity	Cilley Covered Bridge
Tunbridge vicinity	Flint Covered Bridge
Tunbridge vicinity	Howe Covered Bridge
Union Village	Union Village Covered Bridge
ORLEANS COUNTY	
Coventry vicinity	Orne Covered Bridge
North Troy vicinity	River Road Covered Bridge
RUTLAND COUNTY	
Brandon vicinity	Dean Covered Bridge
Brandon vicinity	Sanderson Covered Bridge
East Clarendon vicinity	Kingsley Covered Bridge
North Clarendon vicinity	Brown Covered Bridge
Pittsford vicinity	Cooley Covered Bridge
Pittsford vicinity	Depot Covered Bridge
Pittsford vicinity	Hammond Covered Bridge
Proctor vicinity	Gorhan Covered Bridge
WASHINGTON COUNTY	
East Montpelier vicinity	Coburn Covered Bridge
Northfield	Slaughterhouse Covered Bridge
Northfield Falls	Lower Cox Brook Covered Bridge
Northfield vicinity	Northfield Falls Covered BRidge
Northfield vicinity	Stony Brook Covered Bridge
Northfield vicinity	Upper Cox Brook Covered Bridge
Plainfield vicinity	Martin Covered Bridge
Waitsfield	Great Eddy Covered Bridge
Waitsfield vicinity	Pine Brook Covered Bridge
Warren	Warren Covered Bridge

COVERED BRIDGES IN VERMONT

WINDHAM COUNTY

Bartonsville	Bartonsville Covered Bridge
Bellows Falls vicinity	Hall Covered Bridge
Brattleboro vicinity	Creamery Covered Bridge
Dummerston	West Dummerston Covered Bridge
East Putney	East Putney Brook Stone Arch Bridge
Grafton vicinity	Kidder Covered Bridge
Green River	Green River Covered Bridge
Newfane vicinity	Williamsville Covered Bridge
Putney	Sacketts Brook Stone Arch Bridge
Rockingham vicinity	Worrall Covered Bridge
Townshend vicinity	Scott Covered Bridge

WINDSOR COUNTY

Hartland vicinity	Martin's Mill Covered Bridge
Hartland vicinity	Willard Covered Bridge
Perkinsville vicinity	Upper Falls Covered Bridge
Windsor vicinity	Best's Covered Bridge
Windsor vicinity	Bowers Covered Bridge
Woodstock vicinity	Lincoln Covered Bridge
Woodstock vicinity	Taftsville Covered Bridge

B7P 10/3/80

Covered Bridge Collapses Into Saxtons River

The Associated Press

SAXTONS RIVER — A covered bridge collapsed Thursday, sending a dump truck, its driver and a load of crushed stones into the Saxtons River, state police said.

The driver, Albert Lober, 32, of Westminster was not injured, police said.

The truck owned by the Farnsworth Construction Co. of Westminster was halfway across the bridge at about 8:15 a.m. when the 113-year-old structure caved in, police said.

The 110-foot bridge was posted for a limit of 10 tons, but officials refused to say if the truck weighed more than that.

Police said they would investigate the incident and report their findings to the attorney general's office.

Officials were at the scene all day Thursday trying to get the truck, which was leaking diesel fuel, out of the river.

Traffic along Vermont 121 was detoured during the day while police cleared away the remains of the bridge.

B7P 10/4/80

Truck Overweight By 20 Tons When Bridge Collapsed

ROCKINGHAM — The truck crossing a covered bridge when it collapsed into the Saxtons River Thursday weighed 30 tons, three times the posted limit, town manager Lawrence McAuliffe said Friday.

Windham County State's Attorney John Rocray has been asked to evaluate the incident, McAuliffe said.

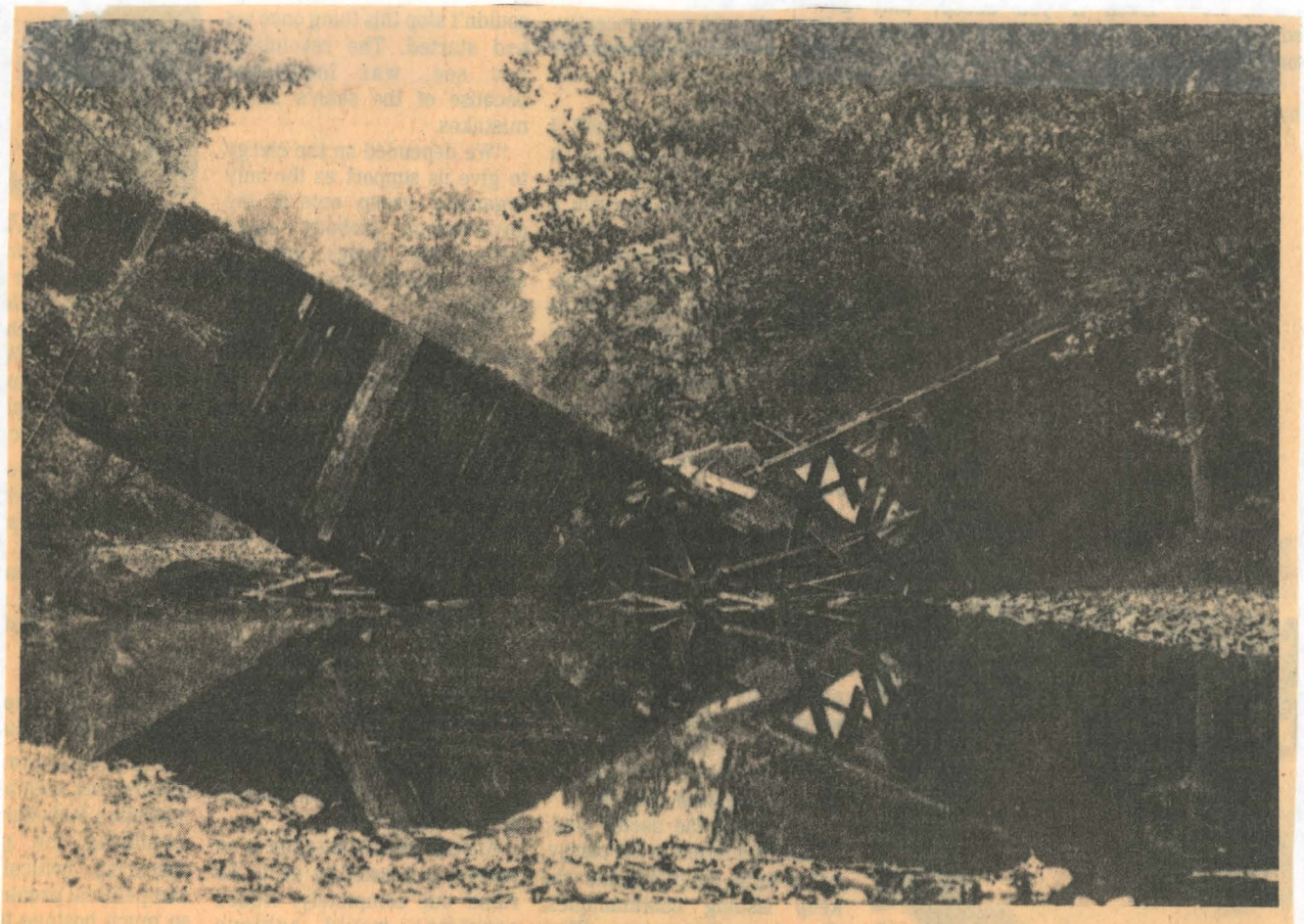
Reconstructing the 113-year-old bridge, in the village of Saxtons River, will cost about $120,000, McAuliffe said. The Farnsworth Construction Co., owner of the truck, will probably be forced to provide funding for restoration, the town manager said.

McAuliffe said the state will contribute about $30,000 and the Vermont Historical Society will provide some funding.

Clearing away the bridge's remains will cost up to $4,000 and take at least eight days, McAuliffe said. A town crew, assisted by a crane from Windsor, will try to salvage the sides of the bridge to use in reconstruction, he said.

McAuliffe said Milton Graton of Ashland, N.H., an expert on covered bridges, will supervise cleanup and restoration.

McAuliffe said there is a slight chance the bridge will not be reconstructed.



The Sign Said 10 Tons

10/5/80

Highway signs have a purpose: They warn drivers of possible road hazards and serve generally to make the roads as safe as possible for all drivers. Last week a graphic illustration was provided of what happens when signs are ignored. A dump truck and its load, weighing 30 tons, tried to negotiate the historic Hall Covered Bridge on Route 121 in Saxtons River. The 113-year-old structure, true to its posted limit, collapsed. The driver narrowly escaped injury.

STATE OF VERMONT

AGENCY OF DEVELOPMENT AND COMMUNITY AFFAIRS

OFFICE OF THE SECRETARY (802) 828-3211 MONTPELIER, VERMONT 05602

DEPARTMENTS OF:
Economic Development 828-3221
Housing & Community Affairs 828-3217

DIVISIONS OF:
Administration 828-3231
Historic Preservation 828-3226
Vermont Travel Division 828-3236
Vermont Life Magazine 828-3241

January 3, 1980

Mr. Richard J. Tatton
Five Ann Street, Apt. 1502
Port Credit, Ontario
CANADA L5G 3E8

Dear Mr. Tatton:

Thank you for your recent letter requesting information on Vermont's covered bridges.

I'm enclosing a brochure on our State's bridges which contains a wide variety of information. I am also enclosing an order blank for a book written by a gentleman who has expertise in the areas of construction and restoration of covered bridges. I know he would be of invaluable assistance to you in your search for information on covered bridges.

Sincerely,

DIVISION FOR HISTORIC PRESERVATION

William B. Pinney

William B. Pinney
Director

cjd

Enclosures

Richard J. Tatton
5 Ann St. Apt. 1502
Port Credit, Ontario
Canada L5G 3E8

December 16,1979

William B Pinney,Director
Historic Preservation Div.
Agency of Dev. & Community Affairs
109 State St.
Montpelier, VT 05602

Dear Sir:

Your name and address were given to me by the American Consulate General in Toronto as the person I should write to regarding covered bridges in your state.

These are very interesting structures and seeing them, as we did this summer on our holidays in your country, brings forth many questions;who built them,what kind of wood was used, what size timbers were used, were plans available to the builder, were there any pictures taken during construction,how are the various members held together? etc. etc.

Do you have any such information that would be available to me and, if so, how should I go about obtaining it?

Thank you very much for your attention to this matter,

Yours truly,

R J Tatton

STATE OF VERMONT

AGENCY OF DEVELOPMENT AND COMMUNITY AFFAIRS

OFFICE OF THE SECRETARY (802) 828-3211 MONTPELIER, VERMONT 05602

DEPARTMENTS OF:
Economic Development 828-3221
Housing & Community Affairs 828-3217

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Administration 828-3231
Historic Preservation 828-3226
Vermont Travel Division 828-3236
Vermont Life Magazine 828-3241

August 31, 1978

Mrs. Bernice Langlois
Rexleigh Road
Salem, New York 12865

Dear Mrs. Langlois:

As you probably know, Vermont has over 100 covered bridges, four of which are owned by our Division. If covered bridges are in good condition, they generally are fairly simple to maintain. However, most of them have been allowed to deteriorate to such an extent that major repairs are required.

The best person I know to examine and recommend work on covered bridges as well as carry out the restoration is Milton Graton of Ashland, New Hampshire. He is a true 19th century craftsman who respects the workmanship and materials that have gone into covered bridges. He is, however, a very busy person and it some times takes him considerable time to inspect a project. One other alternative would be to find a sympathetic structural engineer that could examine the bridge and recommend work and have him work with a reputable contractor. If we can be of any further help, please contact us.

Sincerely,

DIVISION FOR HISTORIC PRESERVATION

Eric Gilbertson

Eric Gilbertson
Assistant Director

EG/cjd

July 23, 1978

Director
Agency of Development and
Community Affairs
Montpelier, VT 05602

Dear Sir:

We need your help in the following matter. We are looking for the name and address of a man who is qualified to examine the construction of a covered bridge.

Washington County has four of New York State's twenty-nine covered bridges: (1) co-owned with Rensselaer County, (2) privately owned and operated as a museum, (3) recently repaired after flood damage and now open and (4) the Rexleigh covered bridge, which has been closed almost a year and which the County Highway Department now says is too expensive to repair. They also claim that it cannot carry school buses, fire engines, etc., and is therefore not practical. However, the bridge has handled neighborhood traffic for 104 years without any maintenance.

We live next to the bridge and think it's worth saving for future generations. Petitions were presented to the Washington County (NY) Board of Supervisors to no avail. The County Highway Department wants to move it to dry land and has refused the grant offered through the state for the preservation of historic sites. The bridge is on the National Historic Register.

We know that Vermont cares about and protects its bridges, but don't know whom to contact.

We urgently need the name and address of someone who could come and inspect the bridge and tell us what has to be done, approximately how much it would cost and what weight vehicles it could be expected to carry.

Thank you for any help you can give us.

Very truly yours,

Bernice Langlois

(Mr)Bernice Langlois
Rexleigh Road
Salem, NY 12865

OFFICE OF THE COMMISSIONER

W. H. Pinney

Eric
info

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
MONTPELIER
05602

RECEIVED APR 21 1978

April 20, 1978

Michael Nagler, Planner
Parks and Open Space Division
Environmental Management Department
125 East 8th Avenue
Eugene, Oregon 97401

Dear Mr. Nagler:

In reply to questions in your letter of March 23, 1978, I wish to offer the following comments:

1. All of Vermont's publicly owned covered bridges have been designated as State Historic Sites and are protected from destruction, removal, or alteration by Vermont Statutes under supervision of the Historic Preservation Division of the Agency of Development and Community Affairs of Vermont. Vermont Statutes also require public notification of the intent to destroy or remove a covered bridge including notification to the Governor and Chairman of the Board of Historic Sites. At least 90 of the covered bridges are also on the National Register of Historic Sites.

A pamphlet of Vermont Covered Bridges is enclosed.

2. No site criteria has been developed for moving covered bridges to an alternate site, as it would be a rare occasion when one would be moved.

3. An opportunity for citizen involvement for preservation of covered bridges is covered by Vermont Statutes, a copy of which is enclosed.

4. One covered bridge, which is bypassed by vehicular traffic, has been left in place and incorporated into a shelter for a picnic area.

5. We have not encountered a circumstance where destruction of a covered bridge is the only recourse, but it conceivable that this could occur in emergency situations such as blocking the waterway of a stream, etc.

6. In the past, we have altered some covered bridges by installing a floor system with concrete deck on steel beams or wood deck on steel beams to relieve the bridge of heavy live loads rather than bypass the bridge. This type of alteration meets with disfavor among covered bridge preservationists, although it has been very effective in lengthening the useful life of the bridge.

7. All covered bridges, except one on the State Highway System, are under jurisdiction of local authorities (town officials) with the exception of private bridges.

The State Agency of Transportation occasionally assists towns in the repair of covered bridges, and some grants of Federal funds are available from the Historic Preservation Division of the Agency of Development and Community Affairs.

It would be practically impossible in Vermont to vacate and delegate responsibility of covered bridges to private individuals.

8. Enclosed please find copies of Vermont Statutes which relate to historic preservation.

If you desire further information, I would suggest that you contact the following individual:

William H. Pinney, Director
Historic Preservation Division
Agency of Development and Community Affairs
109 State Street
Montpelier, Vermont 05602
Tel. (802) 828-3226

If I can be of further assistance, please advise.

Sincerely,

Wendell M. Smith

Wendell M. Smith
Structures Engineer
Agency of Transportation

WMS/ds
Enclosures
cc: William H. Pinney

Bob can you [illegible]

lane county

March 23, 1978

Wendel Smith
State Highway Engineer
Bridge Division
Montpelier, Vermont 05602

Dear Mr. Smith:

Lane County, Oregon is in the process of identifying which of their 19 covered bridges should be placed on The National Register. The Board of County Commissioners are attempting to formulate response to the State by May 1978. It is assumed their recommendation will influence the disposition of two privately owned covered bridges in the County. It would be appreciated if your office would provide information pertaining to the following requests:

1. Criteria for rating and selection of significant historical covered bridges that should be nominated.
2. Site location criteria for moving a bridge to an alternate site.
3. Effective citizen involvement programs promoting preservation of covered bridges.
4. Other alternative uses of covered bridges closed to vehicular traffic such as automobiles and trucks.
5. Are there exceptional circumstances where destruction of a covered bridge becomes the only recourse?
6. Other methods helpful in preventing destruction of covered bridges.
7. Implications to Lane County of vacating and delegating the responsibility of covered bridges to private individuals.
8. Specific ordinances or other governmental regulations relating to preservation of covered bridges.

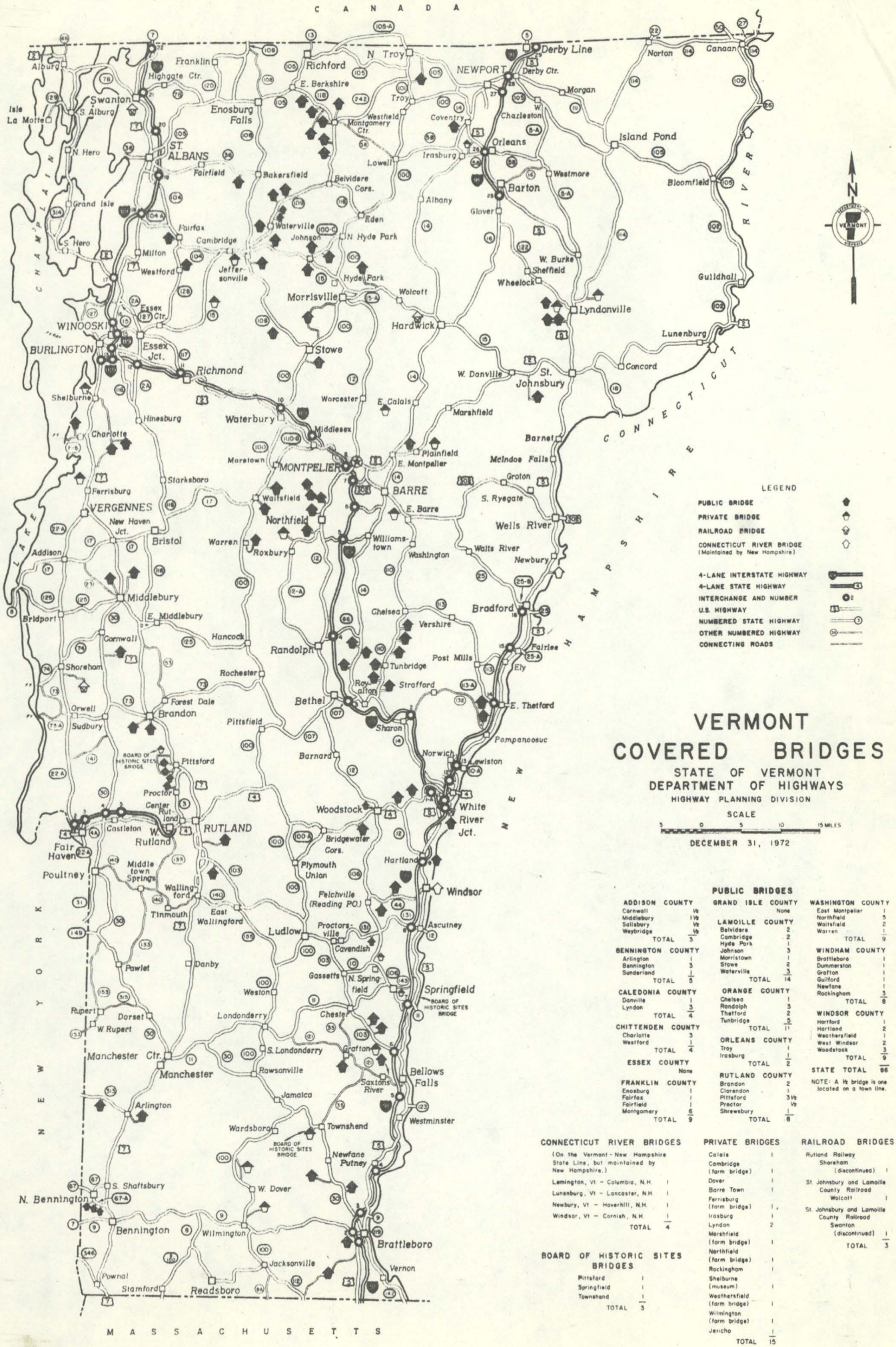
The above list is not exclusive, therefore, additional comments are invited.

I hope your office can provide some assistance. Your time and efforts are appreciated.

Sincerely,

Michael Nagler, Planner
Parks and Open Space Division

MN/eg
cc: Evald Nielsen, Dir.
Parks and Open Space Div.



VERMONT COVERED BRIDGES

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
HIGHWAY PLANNING DIVISION

SCALE

5 0 5 10 15 MILES

DECEMBER 31, 1972

PUBLIC BRIDGES

ADDISON COUNTY	
Cornwall	½
Middlebury	1½
Salisbury	½
Weybridge	½
TOTAL	3

BENNINGTON COUNTY	
Arlington	1
Bennington	3
Sunderland	1
TOTAL	5

CALEDONIA COUNTY	
Danville	1
Lyndon	3
TOTAL	4

CHITTENDEN COUNTY	
Charlotte	3
Westford	1
TOTAL	4

ESSEX COUNTY
None

FRANKLIN COUNTY	
Enosburg	1
Fairfax	1
Fairfield	1
Montgomery	6
TOTAL	9

GRAND ISLE COUNTY
None

LAMOILLE COUNTY	
Belvidere	2
Cambridge	2
Hyde Park	1
Johnson	3
Morristown	1
Stowe	2
Waterville	3
TOTAL	14

ORANGE COUNTY	
Chelsea	1
Randolph	3
Thetford	2
Tunbridge	5
TOTAL	11

ORLEANS COUNTY	
Troy	1
Irasburg	1
TOTAL	2

RUTLAND COUNTY	
Brandon	2
Clarendon	1
Pittsford	3½
Proctor	1½
Shrewsbury	1
TOTAL	8

WASHINGTON COUNTY	
East Montpelier	1
Northfield	5
Waitsfield	2
Warren	1
TOTAL	9

WINDHAM COUNTY	
Brattleboro	1
Dummerston	1
Grafton	1
Guilford	1
Newfane	1
Rockingham	3
TOTAL	8

WINDSOR COUNTY	
Hartford	1
Hartland	2
Weathersfield	1
West Windsor	2
Woodstock	3
TOTAL	9

STATE TOTAL	86

NOTE: A ½ bridge is one located on a town line.

CONNECTICUT RIVER BRIDGES

(On the Vermont - New Hampshire State Line, but maintained by New Hampshire.)

Lemington, Vt. – Columbia, N.H.	1
Lunenburg, Vt. – Lancaster, N.H.	1
Newbury, Vt. – Haverhill, N.H.	1
Windsor, Vt. – Cornish, N.H.	1
TOTAL	4

BOARD OF HISTORIC SITES BRIDGES

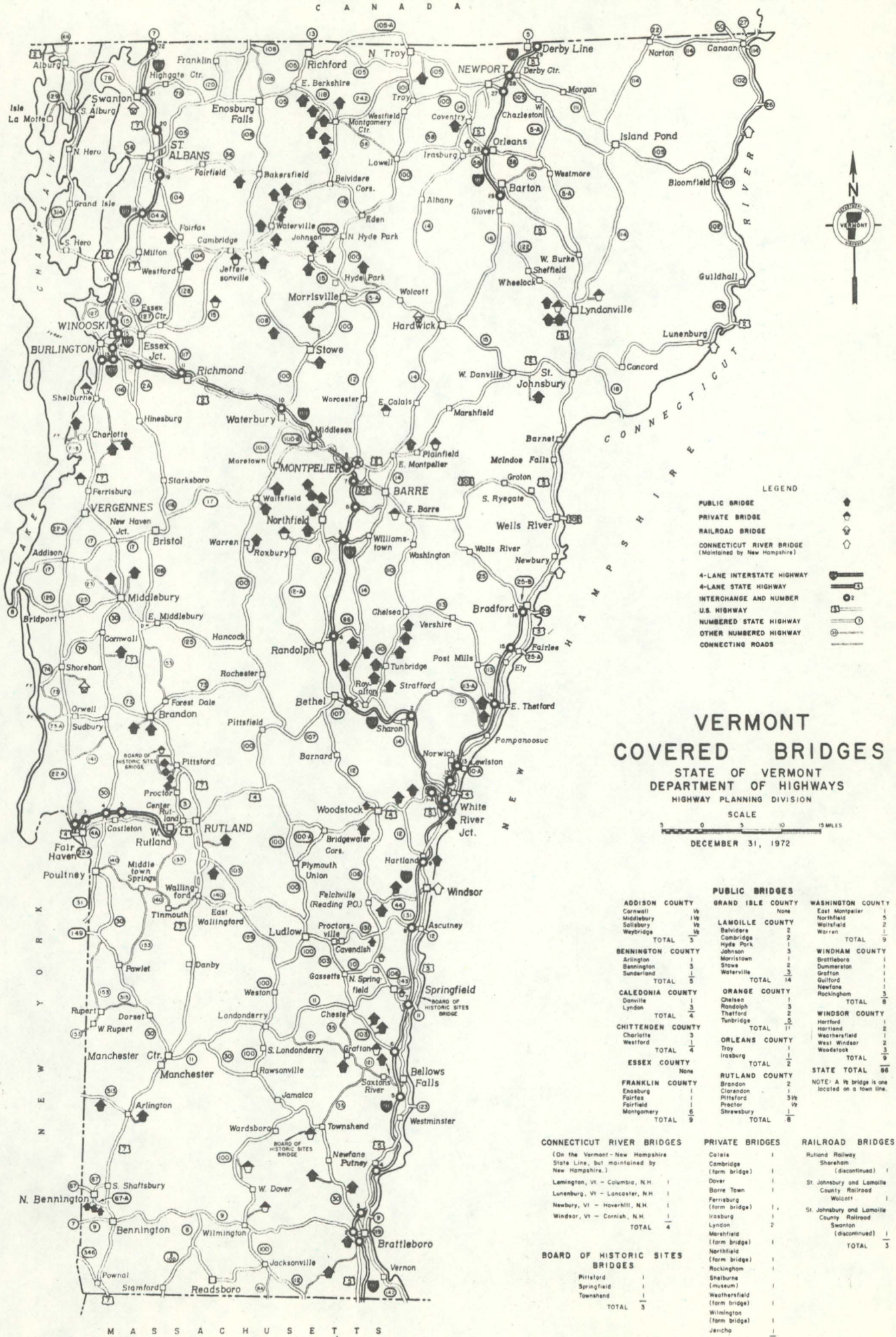
Pittsford	1
Springfield	1
Townshend	1
TOTAL	3

PRIVATE BRIDGES

Calais	1
Cambridge (farm bridge)	1
Dover	1
Barre Town	1
Ferrisburg (farm bridge)	1
Irasburg	1
Lyndon	2
Marshfield (farm bridge)	1
Northfield (farm bridge)	1
Rockingham	1
Shelburne (museum)	1
Weathersfield (farm bridge)	1
Wilmington (farm bridge)	1
Jericho	1
TOTAL	15

RAILROAD BRIDGES

Rutland Railway	
Shoreham (discontinued)	1
St. Johnsbury and Lamoille County Railroad	
Wolcott	1
St. Johnsbury and Lamoille County Railroad	
Swanton (discontinued)	1
TOTAL	3



VERMONT COVERED BRIDGES

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
HIGHWAY PLANNING DIVISION

SCALE
5 0 5 10 15 MILES

DECEMBER 31, 1972

PUBLIC BRIDGES

ADDISON COUNTY	
Cornwall	½
Middlebury	1½
Salisbury	½
Weybridge	½
TOTAL	3

BENNINGTON COUNTY	
Arlington	1
Bennington	5
Sunderland	1
TOTAL	7

CALEDONIA COUNTY	
Danville	1
Lyndon	3
TOTAL	4

CHITTENDEN COUNTY	
Charlotte	3
Westford	1
TOTAL	4

ESSEX COUNTY
None

FRANKLIN COUNTY	
Enosburg	1
Fairfax	1
Fairfield	1
Montgomery	6
TOTAL	9

GRAND ISLE COUNTY
None

LAMOILLE COUNTY	
Belvidere	2
Cambridge	2
Hyde Park	1
Johnson	3
Morristown	1
Stowe	2
Waterville	3
TOTAL	14

ORANGE COUNTY	
Chelsea	1
Randolph	3
Thetford	2
Tunbridge	5
TOTAL	11

ORLEANS COUNTY	
Troy	1
Irasburg	1
TOTAL	2

RUTLAND COUNTY	
Brandon	2
Clarendon	1
Pittsford	3½
Proctor	½
Shrewsbury	1
TOTAL	8

WASHINGTON COUNTY	
East Montpelier	1
Northfield	5
Waitsfield	2
Warren	1
TOTAL	9

WINDHAM COUNTY	
Brattleboro	1
Dummerston	1
Grafton	1
Guilford	1
Newfane	1
Rockingham	3
TOTAL	8

WINDSOR COUNTY	
Hartford	1
Hartland	2
Weathersfield	1
West Windsor	2
Woodstock	3
TOTAL	9

STATE TOTAL	86

NOTE: A ½ bridge is one located on a town line.

CONNECTICUT RIVER BRIDGES

(On the Vermont - New Hampshire State Line, but maintained by New Hampshire.)

Lemington, Vt. – Columbia, N.H.	1
Lunenburg, Vt. – Lancaster, N.H.	1
Newbury, Vt. – Haverhill, N.H.	1
Windsor, Vt. – Cornish, N.H.	1
TOTAL	4

BOARD OF HISTORIC SITES BRIDGES

Pittsford	1
Springfield	1
Townshend	1
TOTAL	3

PRIVATE BRIDGES

Calais	1
Cambridge (farm bridge)	1
Dover	1
Barre Town	1
Ferrisburg (farm bridge)	1
Irasburg	1
Lyndon	2
Marshfield (farm bridge)	1
Northfield (farm bridge)	1
Rockingham	1
Shelburne (museum)	1
Weathersfield (farm bridge)	1
Wilmington (farm bridge)	1
Jericho	1
TOTAL	15

RAILROAD BRIDGES

Rutland Railway Shoreham (discontinued)	1
St. Johnsbury and Lamoille County Railroad Wolcott	1
St. Johnsbury and Lamoille County Railroad Swanton (discontinued)	1
TOTAL	3

STATE OF VERMONT

AGENCY OF DEVELOPMENT AND COMMUNITY AFFAIRS

OFFICE OF THE SECRETARY (802) 828-3211 MONTPELIER, VERMONT 05602

DEPARTMENTS OF:
Economic Development 828-3221
Housing & Community Affairs 828-3217

DIVISIONS OF:
Administration 828-3231
Historic Preservation 828-3226
Vermont Travel Division 828-3236
Vermont Life Magazine 828-3241

February 28, 1978

Mr. Jonathan Merrill
151 East 83rd Street
New York, New York 10028

Dear Mr. Merrill:

In reply to your request for information on covered bridges and white houses in Vermont, I am enclosing a brochure and a copy of an article from The Old-House Journal. I believe they will answer your questions. You will note in the paint article that white lead paint was the cheapest and most extensively used pigment for paint. Therefore, I suspect that therein lies the reason for its extensive use in Vermont.

Briefly, the purpose of roofs on covered bridges is to provide protection for the wooden beams in the bridge from the weather.

Sincerely,

DIVISION FOR HISTORIC PRESERVATION

Eric Gilbertson
Assistant Director

EG/cjd

Enclosures

JONATHAN MERRILL

February 22, 1978.

Vermont Historic Sites Commission

Sir -

During a recent visit to Vermont, two questions occured that I hope you can answer or refer me to the answer:

a) What was the purpose of covering wooden bridges?

b) What factors caused so many old Vermont houses to be painted white?

Your help in ~~asw~~ answering these questions will help satify my curiousity.

Sincerely yours,

Jonathan Merrill

151 EAST 83rd STREET NEW YORK, NEW YORK 10028

STATE OF VERMONT

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OFFICE OF THE SECRETARY (802) 828-3211 MONTPELIER, VERMONT 05602

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Historic Preservation 828-3226
Vermont Travel Division 828-3236
Vermont Life Magazine 828-3241

February 22, 1978

Mr. Allen J. Ruble
7520 Kings Way Drive
Fort Wayne, Indiana 46819

Dear Mr. Ruble:

Thank you for your recent letter inquiring about Vermont's covered bridges. Enclosed please find a brochure with additional information regarding these bridges which I think might prove very helpful to you.

If further information not contained in the brochure is needed, we do have the bridges listed in our National Register books here in the office. We would be glad to provide you with a limited number of copies of these listings at 15 cents per page.

Please contact us again if we can be of further assistance.

Sincerely,

DIVISION FOR HISTORIC PRESERVATION

Eric Gilbertson

Eric Gilbertson
Assistant Director

EG/cjd

Enclosure

P.S. Before I moved to Vermont I worked in a similar capacity in Indiana. Say Hello to Biel Brandenburg of the Indiana Covered Bridge Comm.

EG.

Vermont Division
Historic preservation

February 17, 1978

Do you have information regarding wooden covered bridges in the state of Vermont, other than the state highway maps.

I am looking for information regarding bridge names, year built, name of stream, etc.

I have photographed most of the bridges in Vermont, but would like this additional descriptive information, if it is available.

I am sending a return stamped envelope for your answer.

If such information is available will you please advise of the cost and where to write for it.

Sincerely yours
ALLEN I. RUBLE
7520 KINGSWAY DRIVE
FORT WAYNE, INDIANA
46819

STATE OF VERMONT

AGENCY OF DEVELOPMENT AND COMMUNITY AFFAIRS

OFFICE OF THE SECRETARY (802) 828-3211

MONTPELIER, VERMONT 05602

DEPARTMENTS OF:
Economic Development 828-3221
Housing & Community Affairs 828-3217

DIVISIONS OF:
Administration 828-3231
Historic Preservation 828-3226
Vermont Travel Division 828-3236
Vermont Life Magazine 828-3241
Outdoor Advertising 828-3215

September 20, 1977

Mr. Neal G. Templeton
Wantastiquet Drive
Brattleboro, Vermont 05301

Dear Mr. Neal Templeton:

Thanks very much for giving us a supply of the "Vermont's Covered Bridges" publication. It is certainly an outstanding piece of work.

Having this will be very helpful in replying to the many requests we get for the information in its contents.

With best wishes.

Sincerely,

DIVISION FOR HISTORIC PRESERVATION

Bill Pinney

William B. Pinney
Director

WBP/cjd

Memo

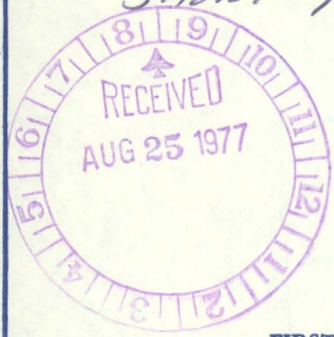
From
NEAL G. TEMPLETON

To Hi Bill,

Enclosed is our pamphlet on Vermont's Covered Bridges. Peter Benton will be delivering a supply to your office shortly.

Thanks,

Neal



~~Covered Bridges~~
Hyde Park

February 22, 1972

Mr. Louis Peck
Assistant Attorney General
Attorney General's Office
Montpelier, Vermont 05602

Dear Mr. Peck:

I am enclosing a copy of V.S.A. Title 19, Chapter 13, Section 1624a in regard to removal of covered bridges. As you can see by the attached clipping, the town of Hyde Park has sold a town covered bridge for the purpose of dismantling. No notification was made as required in the statute.

In general, I feel that it is useless to have laws unless some action is taken when they are ignored or violated. I would appreciate your opinions as to what we should do in this case. It may well be a forecast of more to come.

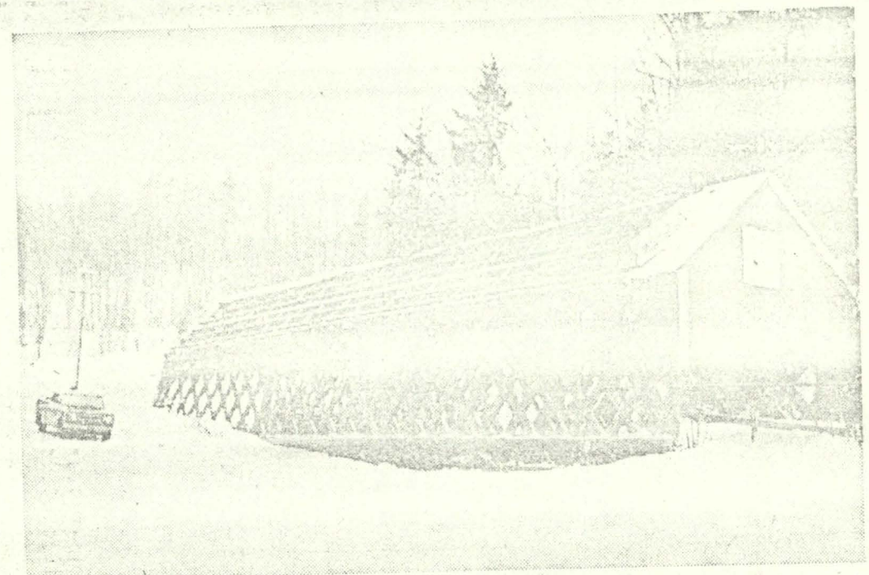
Sincerely yours,

William B. Pinney
Director
Historic Sites Division.

WBP:md

The Garfield Bridge

What Does One Do With a Dismantled Covered Bridge?



DOWN BUT NOT OUT — Employes of J. Phillip Rich of Elmore remove the last of the metal roofing on one side of the Garfield covered bridge in Hyde Park preparatory to a piece-by-piece dismantling of the wooden structure. Rich, who purchased the abandoned bridge from the town, hopes to find a new buyer who will rebuild and preserve it on a new site.

(Photo by Bob Hagerman)

HYDE PARK — It is this town's last remaining covered bridge. It was closed to vehicular traffic some years ago when a culvert and fill took its place just downstream. While somewhat decrepit it is not in ruins though it has been fast headed that way.

It is the Garfield covered bridge and it is now in the process of being dismantled and removed from its site over the Green River. But through the efforts and interest — and money — of a nearby Elmore resident this relic of earlier days may yet be resurrected to service again.

In something of a one-man campaign to save the bridge, J. Philip Rich of Elmore purchased it from the town and is in turn now seeking a buyer, preferably one who will reconstruct the bridge to serve its original and lifelong function. But this really represents the end, not the beginning, of Rich's efforts.

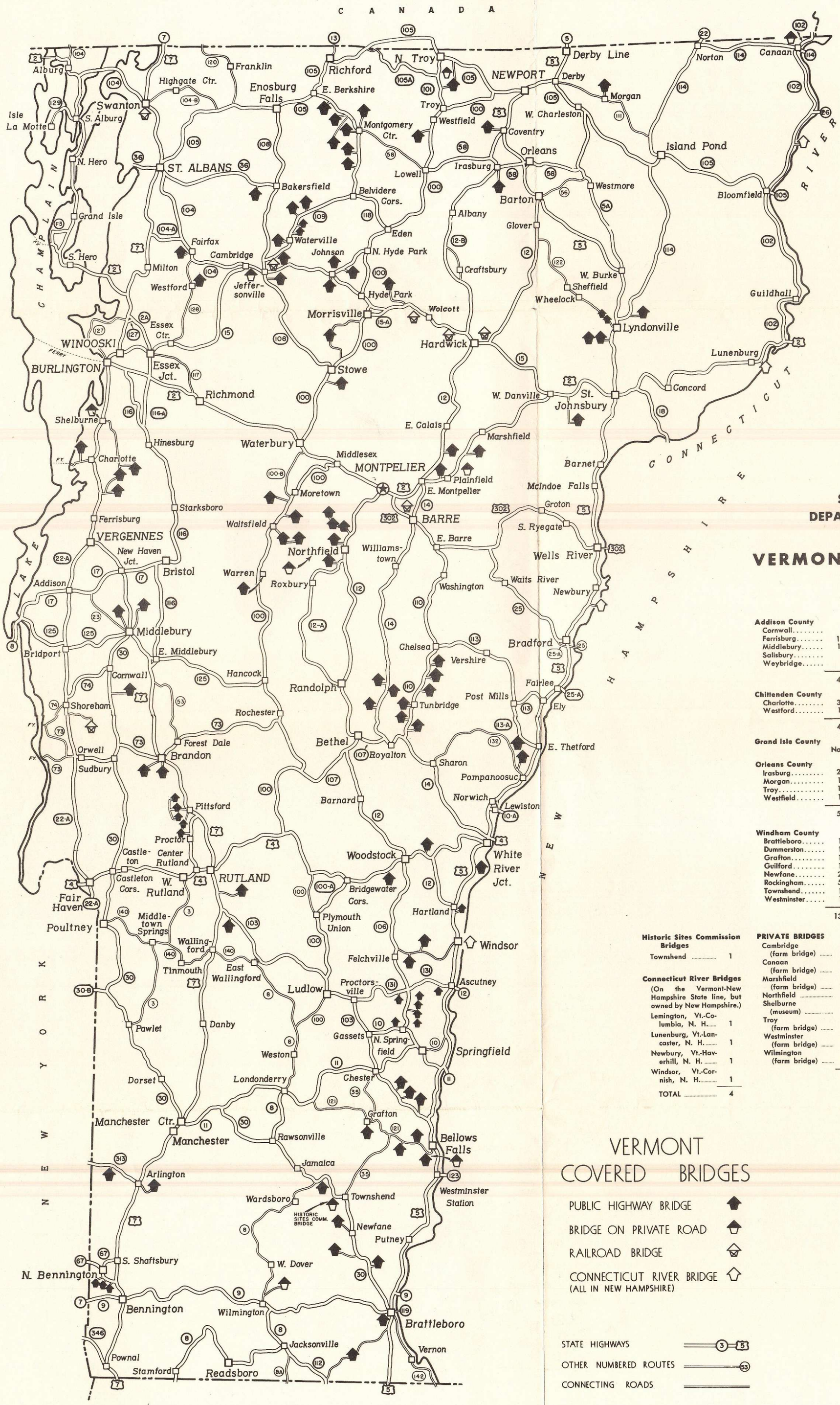
Back in 1965, when Hyde Park selectmen closed the bridge and installed the culvert for a new stream crossing, Rich approached various selectmen and urged them to preserve the bridge. But the selectmen, he says, felt they could not properly spend further public monies on the bridge.

Rich didn't let the matter rest there. "I hate to see anything wasted," he says. "Even poor utilization of something is better than no utilization at all." So last year he got the selectmen to sell him the bridge. It is now a somewhat slack time for the land surveying business which Rich operates and early this month he put some of his men — Dick Ryder, Raoul McAllister and Lawrence Douglas — to work carefully dismantling the bridge to be stored away pending its hoped-for resale.

Last fall Rich ran an ad in the Wall Street Journal offering the bridge for sale. He had several inquiries but no firm takers though one prospect from Rutland is still a possibility. "It was a bad time of year to run the ad," Rich says, "and I'll probably try it again come warm weather."

Rich's first hope is to sell the wooden structure for re-use as a bridge. But failing that his reserve plan is to divide the bride in half set each of the two parts over a small brook and convert them himself to private homes. "That would not be the best use," he says, "but it would be a use and there are people, I'm sure, who would find a covered bridge house very attractive.

But there could be hang-ups to even that plan. Thus except for limited salvage value Rich is running the risk of a nearly total loss of his investment in the purchase and dismantling of the bridge.



2-'56

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
MONTPELIER

VERMONT COVERED BRIDGES

April 1, 1958

PUBLIC HIGHWAY BRIDGES

Addison County	
Cornwall	½
Ferrisburg	1
Middlebury	1½
Salisbury	½
Weybridge	½
	4
Chittenden County	
Charlotte	3
Westford	1
	4
Grand Isle County	None
Orleans County	
Irasburg	2
Morgan	1
Troy	1
Westfield	1
	5
Windham County	
Brattleboro	1
Dummerston	1
Grafton	1
Guilford	1
Newfane	2
Rockingham	5
Townshend	1
Westminster	1
	13
Bennington County	
Arlington	1
Bennington	3
Sunderland	1
	5
Essex County	None
Lamoille County	
Belvidere	2
Cambridge	2
Hyde Park	1
Johnson	3
Morristown	1
Stowe	1
Waterville	3
	13
Rutland County	
Brandon	2
Clarendon	1
Pittsford	4½
Proctor	½
Shrewsbury	1
	9
Windsor County	
Hartland	2
Springfield	1
Weathersfield	6
West Windsor	2
Woodstock	2
	13
Caledonia County	
Danville	1
Lyndon	5
	6
Franklin County	
Enosburg	1
Fairfax	1
Fairfield	1
Montgomery	6
	9
Orange County	
Chelsea	1
Randolph	3
Thetford	2
Tunbridge	5
	11
Washington County	
Calais	1
E. Montpelier	1
Fayston	1
Marshfield	1
Northfield	5
Waitsfield	3
Warren	1
	13
TOTAL	105

(NOTE: A ½ bridge is one located on a town line.)

Historic Sites Commission Bridges

Townshend	1

Connecticut River Bridges
(On the Vermont-New Hampshire State line, but owned by New Hampshire.)

Lemington, Vt.-Columbia, N. H.	1
Lunenburg, Vt.-Lancaster, N. H.	1
Newbury, Vt.-Haverhill, N. H.	1
Windsor, Vt.-Cornish, N. H.	1
TOTAL	4

PRIVATE BRIDGES

Cambridge (farm bridge)	1
Canaan (farm bridge)	1
Marshfield (farm bridge)	1
Northfield	1
Shelburne (museum)	1
Troy (farm bridge)	1
Westminster (farm bridge)	1
Wilmington (farm bridge)	1
	8

RAILROAD BRIDGES

Barre and Chelsea Railroad	
Between Montpelier and Barre	1
Rutland Railroad	
At East Shoreham (discontinued)	1
St. Johnsbury & Lamoille County Railway	
At Swanton	1
At Cambridge Jct.	1
West of Wolcott	1
Between Hardwick and Wolcott	1
Between Hardwick and E. Hardwick	1
TOTAL	7

VERMONT COVERED BRIDGES

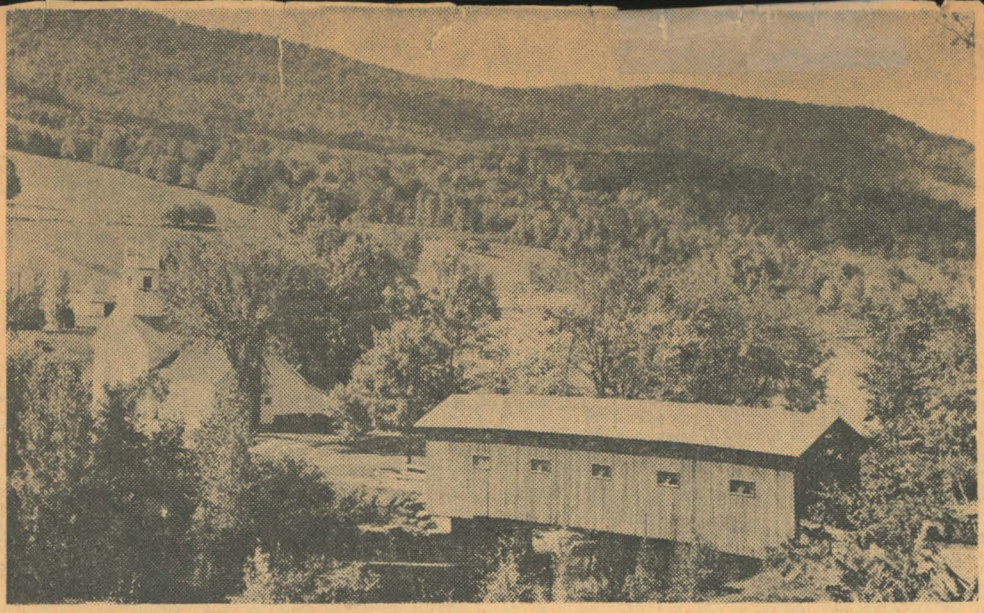
PUBLIC HIGHWAY BRIDGE
BRIDGE ON PRIVATE ROAD
RAILROAD BRIDGE
CONNECTICUT RIVER BRIDGE (ALL IN NEW HAMPSHIRE)

STATE HIGHWAYS
OTHER NUMBERED ROUTES
CONNECTING ROADS

Corrected to April 1, 1958

Compiled and drawn by State of Vermont, Department of Highways

MAY 3, 1966



Covered bridge on Batten Kill at West Arlington is one of sights for travelers along New England Heritage Trail.

Top New England Attractions Located Along Heritage Trail

There are new and exciting things to see and do along New England's Heritage Trail this year.

Plimouth Plantation is recreating three new houses of the Pilgrim Village of 1627 to bring to 12 the number of homes open to the public.

Connecticut's Mystic Seaport has restored and opened to the public one of the last of the great Gloucester fishing schooners.

Longfellow's Wayside Inn has reopened its doors after being closed by fire, and is now ready to welcome travelers as it has been doing since the year 1686.

At Old Sturbridge Village in Massachusetts additional old buildings have been gathered together to bring to 36 the number available to visitors. The village is a re-creation of American life in the period from 1790 to 1840.

The Heritage Trail is a highway tour of the six New England states bringing the visitor to the best things the region has to offer. It is a guided tour of the history, culture, scenery and recreational attractions of New England. It embraces more than 1,000 outstanding sites, and was drawn up by travel experts after a year of study.

Heritage Trail brings the visi- area in New England. It winds alongside sparkling lakes and white beaches, and meanders through striking mountain passes. Almost every mile of it has a summer theater, a museum to every major recreational seum, a historic site, a battlefield, a country fair, an art show or other interesting places to see.

The lakes and mountains of Maine, New Hampshire and Vermont are world recognized for beauty and serenity. The Maine coast offers picturesque fishing villages, Maine lobster and boat trips to offshore islands.

Rhode Island is a yachtsman's paradise and a mecca for fishermen. The Connecticut coast is picturesque with many small fishing villages and excellent beachers.

Plimoth Plantation is located less than an hour's drive from Boston. Here New Englanders have re-created the brave village of the Pilgrims who survived with 3,000 miles of sea on one side of them and 3,000 miles of wilderness on the other.

Mystic Seaport now has more than 100 ships and boats available for public visit. They include the Charles W. Morgan, one of the last of the great wooden whaling vessels.

At South Sudbury, Mass., you can sit in the same room where the poet Longfellow wrote his famous "Tales of a Wayside Inn." The inn is a treasure trove of antiques and interesting historic items. It is the oldest operating inn in the country.

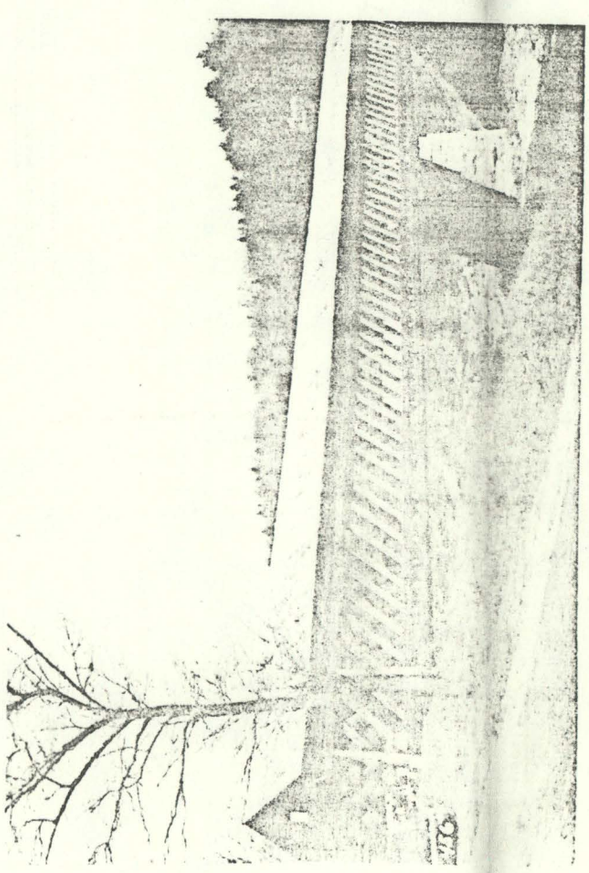
In Boston the visitor can walk the "Freedom Trail," and visit the greatest collection of historic sites to be found anywhere in such a small area. Here are the Paul Revere House, Feneuil Hall, Bunker Hill Monument, the Old North Church (where Paul Revere hung his lantern to warn of the coming of the British), the site of the Boston Massacre and many others. The USS Constitution (1794) is moored in Boston Harbor and open to visitors all year round.

Along Heritage Trail you can visit historic forts, the mansions of Newport, climb the rigging of old ships, play golf, hunt, fish, take a ferry boat ride to the outer islands, swim, beachcomb, have a clambake or eat in a sophisticated restaurant.

For a free brochure of the New England Heritage Trail, write to: Heritage Trail Foundation, Room 805, 131 Clarendon St., Boston 02116.

Serving Windham County, Vermont and Southwestern New Hampshire
BRATTLEBORO REFORMER
BRATTLEBORO, VERMONT FRIDAY, NOVEMBER 19, 1976

BRIDGE PROBLEMS? — Neal Templeton of Brattleboro, a covered bridge enthusiast, says there are structural problems with the Dummerston covered bridge on Rte. 30 which should be corrected. He presented his findings to the Dummerston selectmen about a year ago. They, in turn, asked the state to make safety checks. In October a series of nails were put in the bridge to allow periodic checks of how much, if any, the bridge is moving.



EARLIER REPAIRS — In 1948, the last time major repairs were done to the Brown's

Yes or No in Dummerston?

Bridge Shift Studied

By GREG WORDEN

DUMMERSTON — To many people, the covered bridge spanning the West River next to Rte. 30 here is a symbol of Vermont, "the special place." But some people fear that the bridge may be in jeopardy.

The bridge, built in 1872 by Caleb B. Lamson, is a two-span 280-foot town lattice type construction. The most recent major renovation of the bridge was in 1948 when slightly more than $21,000 was spent to put in a new floor.

In recent years some people have noticed problems starting to creep up on the structure.

According to Clifford Emery, Dummerston's road commissioner for more than 25 years, there have been numerous accidents involving the bridge since the 1948 renovation.

The one-lane bridge is capable of carrying a posted 20,000 pounds and has a clearance of 11 feet three inches. But, Emery said that overly tall trucks have splintered a number of trusses that the town has had to replace. Overweight trucks have also been observed using the bridge, he said.

Templeton Takes Notice

About a year ago a covered bridge buff from Brattleboro, Neal Templeton, told the Dummerston Selectmen he had made a study of the bridge and outlined his findings to them. At that time, according to his findings, one counter brace was badly damaged, lateral bracing was in bad to fair condition, several sway braces were either missing or dislodged and the bridge was sagging in at least one place.

Templeton, who has studied covered bridge construction for some time and makes models of various types of bridges, suggested that the selectmen have an appraisal made to determine the work necessary to bring the bridge into top shape.

The selectmen took note of Templeton's presentation and requested the state Highway Department to do some tests on the bridge to see if the structure was sound.

According to John (Jack) Clifford, state highway department engineer for District II, the bridge floor has been resurfaced with tar, oil, sand and stone this year to help prohibit moisture from harming the bed of the bridge. The highway department in October put out a set of nails along the bridge so that any shifting movement could be detected. The nails, put in place with the aid of a transit, will be checked after a few months to see how much the bridge is moving, Clifford said.

A New Check

Templeton gave the bridge a sight check last week and said he felt the bridge had shifted noticeably since last year. He pointed out that the bridge had visibly bowed enough to allow water to drip on the side of the exterior slats on the north side. On the south side, a slight buckle was detectable near the center of the two spans.

Clifford, when told of the visible buckling, said the Highway Department was trying to figure out whether the shifting was done over a period of time and was just becoming noticeable or whether it was actually shifting a lot all at once.

If the transit check of the bridge, which can be measured down to a 16th of an inch of movement, indicates the bridge is shifting, Clifford said the department would "go back to a bridge expert" to see what is necessary to correct the situation. He noted that the sides of the bridge have nothing to do with the structural strength of the bridge.

Bridge Checked In Dummerston

Continued from Page 1

"I imagine that as long as I'm around, there probably won't be very much done with the permanent structure," Emery said, adding that occasionally he had thoughts about a more modern bridge for the site. He noted that the covered bridge in Dummerston is the only one still in operation along Rte. 30.

Templeton also noted that the bridge is one of only a limited number left in the country. And for that reason, he wants it to be cared for and preserved.

For now it's a period of waiting until the first highway department checks are made.

Bridge A Rarity

The often photographed bridge provides a link for traffic from Rte. 30 to Rte. 5 and is consequently well used, according to Emery, who said there was a lot of sentiment about the bridge.

Covered Bridge Enthusiast Battles To Save 1872 Model

DUMMERSTON, Vt. (UPI) — In 1872 Caleb Lamson built the 280-foot covered bridge that spans the scenic West River.

Its lattice work sides added to the beauty of the winding, boulder-strewn river. And, for more than 100 years, it served as a symbol of Vermont and of a nostalgic longing for the lost art of wooden bridge craftsmanship.

But now the bridge is beginning to show signs of sagging. As a result, Neal Templeton, covered bridge enthusiast and loan officer at a bank in nearby Brattleboro, would like to see something done to preserve the wooden, lattice type structure.

Templeton's hobby is making models of covered bridges. He told Dummerston selectmen about a year ago of a study he made of the Dummerston bridge. That study, according to Templeton, showed several braces were in bad condition and the bridge was sagging in at least one place.

He suggested an appraisal be made to find out what work needed to be done to restore the bridge to top condition.

As a result of Templeton's request, the Vermont Highway Department pounded a series of nails into the bridge last October to see how much, if any, the bridge is shifting.

Early this November, Templeton viewed the nails and determined the bridge has shifted noticeably since last year. The bridge has bowed enough, he said, to cause water to drip on the slats of its north side. On the south side, he noticed a slight buckle near the center of the two-span bridge.

The most recent major renovation of the bridge was in 1948 when some $21,000 was spent to put in a new floor.

Since that repair work there have been numerous accidents on the one lane bridge, says Clifford Emery, the town's road commissioner.

The bridge, he says, is posted for a limit of 10 tons and has a clearance of 11 feet, three inches. But he says tall trucks have splintered a number of trusses that the town has been forced to repair and, on occasion, overweight trucks have been seen using the bridge.

The state's district highway engineer, John Clifford, said the bridge floor was resurfaced this year with tar, oil, sand and stone to help prevent moisture from harming the bed of the bridge.

When told of the visible buckling, Clifford said the state Highway Department was trying to figure out if the shifting was done over an extended period of time or had actually shifted all at once.

Clifford said if a check of the bridge shows movement of one-sixteenth of an inch or more then the department will go back to a bridge expert to correct the situation.

NH Register 12/5/76

59A

Covered Bridge Needs Lift

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Clifford said if a check of the bridge shows movement of one-sixteenth of an inch or more then the department will go back to a bridge expert to correct the situation. He added that visible changes in the sides of the bridge had nothing to do with the structural strength of the bridge.

But town road commissioner Emery was skeptical about the chances of the state taking any action on the bridge.

There's a lot of sentiment for the bridge, he said, but there probably won't be much done about its "permanent" structure.

NEW HAVEN, CONN.

BENN BANNER 12/7/76

teachers' association and the school board was suggested by the teachers as a method of providing such face-to-face discussion.

formation.

mutual funds and annuities for

In Dummerston

Neal Templeton tries to fix 100-year-old covered bridge

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September 2, 1976

Mr. Charles W. Elflein
P. O. Box 246
Stratton Falls Road
Roxbury, New York 12474

Dear Mr. Elflein:

Thank you for your letter of August 27 expressing concern for covered bridges in Vermont.

I am enclosing two pages from this Division's budget proposal for fiscal year 1977-78. As you can see, we have extensive long-range planning for bridge preservation.

Of course, approval of the budget is always subject to consideration by the State Legislature.

Sincerely,

William B. Pinney
Director
Division for Historic Preservation

WBP/p

Encs.

Box 246, Stratton Falls Road
Roxbury, New York 12474
August 29, 1976

Vermont Board of Historic Sites
Montpelier, Vermont 05602

Gentlemen:

I am a 19 year old very interested in covered bridges. On August 14, 1976, I visited the Swanton R.R. Bridge in Swanton. This bridge needs some repairs or else it will be a thing of the past before long. Part of the roof is totally missing. Nothing but blue sky up above. This is the most important part of a covered bridge, the roof. Without a roof, the timbers will rot and decay before long, and then it will be too late to save the Swanton R.R. Bridge. Vermont is very fortunate in having the longest railroad covered bridge in the whole U.S. within its borders, and I hope that the Board of Historic Sites will have the roof fixed up very soon. This bridge is on the National Register, so maybe some matching funds could be set up to pay for the repair. I think that the Board should take over ownership of the Swanton R.R. Bridge (just like Scott, Baltimore, and Hammond Bridges) to insure its upkeep and preservation. Vermont must not lose this priceless bridge!!

On August 21, 1976, I revisited the Scott Bridge in Townshend, which you own. This could also stand major repairs. As I walked across, the bridge seemed to creak and groan, like it was tired and old.

Earlier this year, I wrote to you concerning the East Shoreham R.R. Bridge near Shoreham. You said that you planned to fix it up this summer. I was wondering if you started the work on it yet? Please let me know on the present status of this bridge.

I realize that covered bridge repairs costs an awful lot of money, but it sure pays off in the long run. I am an active member of the New York State Covered Bridge Society, and we raise most of our money to help in these restorations. Every year we →

hold an auction and most of this money goes to helping different towns (not just in New York State) repair their covered bridges. I am putting the address below of the President of the N.Y.S.C.B.S.:

Mrs. Frances Withee
275 Mt. Vernon Avenue
Rochester, New York 14620

Feel free to write her any time. If you would like any help (financially or otherwise), I am sure that our fine group can help out. Vermont happens to be one of our favorite states, and we want to see that all of the covered spans in the Green Mountain State stay in good health. Don't be afraid to contact us, we are here to help.

Pleasant Covered Crossings,
Charles W. Elflein

TO: Ms. Peach Jayal

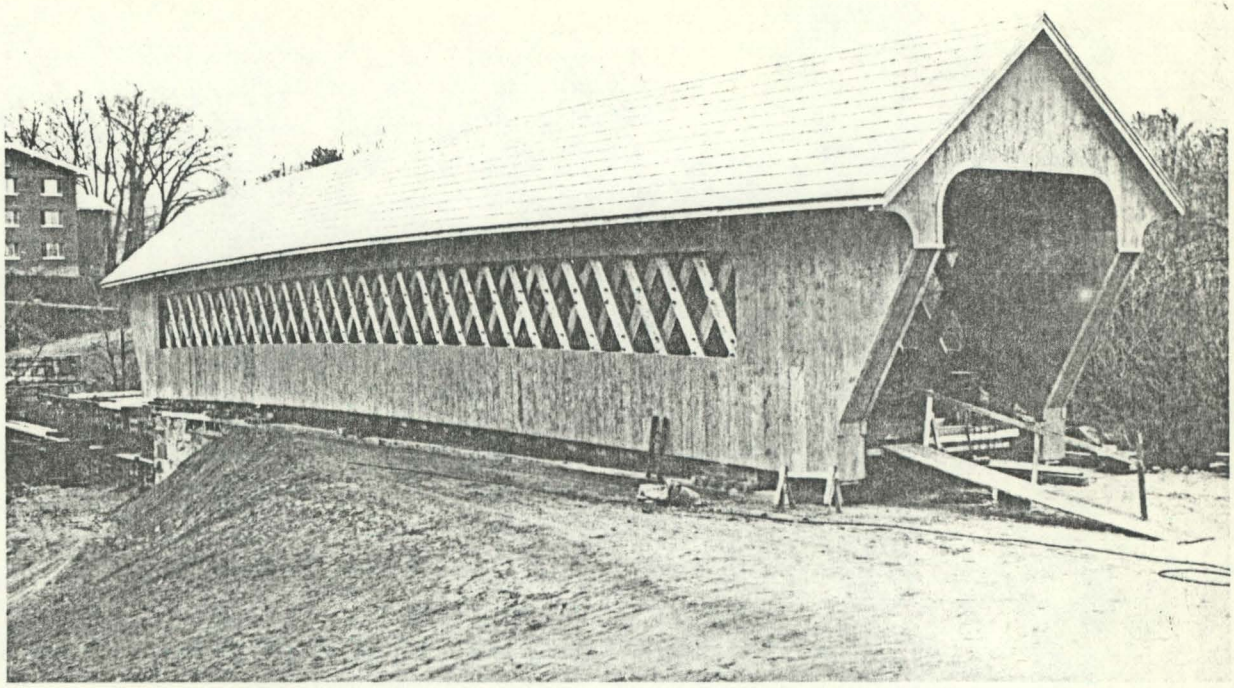
FROM: Eric Gilbertson, Assistant Director

DATE: October 18, 1976

SUBJECT: Your Request for Covered Bridge Information

Enclosed is a map with the Woodstock Bridge marked. It is a heavy load covered bridge. Unless the vehicle you asked about is unusually large, most bridges would accommodate it.

For further information on specific bridges contact Milton Graton, Ashland, New Hampshire. Telephone: (603) 968-3959.



HOW TO BUILD A COVERED BRIDGE

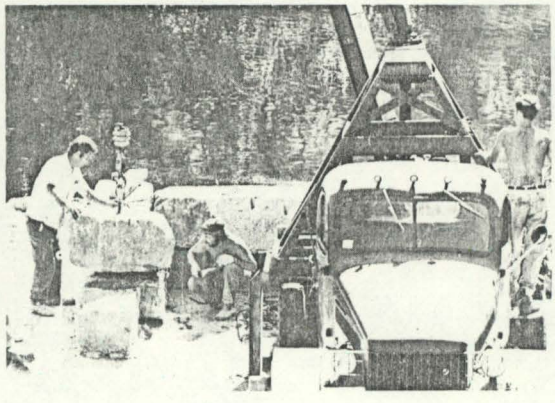
by Leo Callahan

IF you want to build yourself an authentic 19th century wooden covered bridge, don't bother to look around for a copy of "101 Easy Steps to Building A Covered Bridge." There's not a library shelf anywhere holding such a book because no such edition has ever been printed.

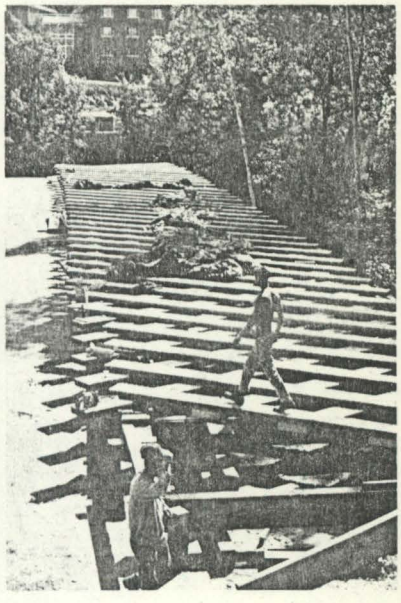
But all the facts, figures and know-how are readily available. All you have to do is travel to Ashland, and look up the father-son bridge-building team of Milton S. and Arnold Graton.

The Gratons are recognized as the last known builders of authentic covered bridges in America and last May 13 put the finishing touches to their latest anachronism in wood, a 150-foot Town Lattice covered bridge that now stretches across the Contoocook River on the New England College campus in Henniker.

(below) Master bridge builder Milton Graton and his son, Arnold, right.



(below left) One of the first tasks in the New England College/Henniker project was constructing the bridge abutments on the Contoocook River. (below) East side Town Lattice truss assembled at the site, view is of the outside of the 19 ton unit.



The 90-ton bridge cost $80,000, and took a year to erect. It was completely hand crafted and fitted by the Gratons with the touch of a 20th century Michaelangelo.

A craftsman with a deep fondness for math, Milton Graton, 63, has surprisingly only been in the covered bridge business since 1959. He didn't plan it that way. It just happened and he says it indirectly came about because of tight finances and a flood.

Graton came to New Hampshire from Willimantic, Conn., to work as a grader operator on a road gang.

"I was accepted at Norwich University in 1927, but when fall came I didn't have any money so I went to work," he said. "In 1930, I ended up in New Hampshire. I liked what I saw so when the job finished I decided to stay on."

In 1936, after spending slightly more than five years hauling logs on a lumber crew supervised by former governor Sherman Adams, who in later years became assistant to President Dwight D. Eisenhower, Graton got his first taste of a brand of engineering that led to his eventual love affair with covered bridges.

"In '36, the Pemigewasset River overflowed and washed a house in Holderness off its foundation and left it in the middle of the road," Graton said. "I was asked if I could move it and I figured I'd give it a try. That's how I got started in the moving and rigging business. After that, I worked moving buildings and during the war years I concentrated on problem construction for various contractors."

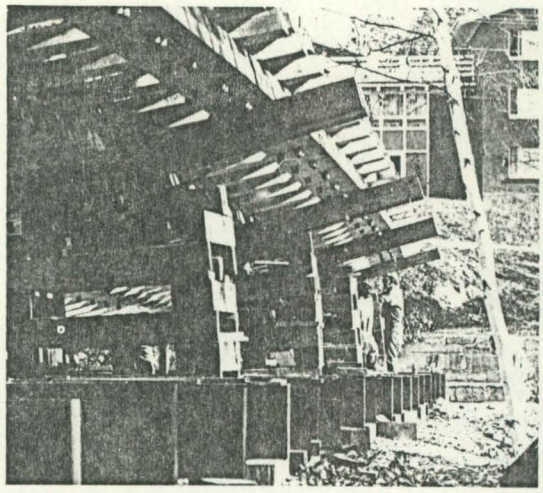
By 1947, Graton was operating his own moving and rigging business and in 1959 he got his first call to move a covered bridge.

"We moved a few bridges for the Army Corps of Engineers over in Vermont," Graton recalled. "Then we got a call to move the 132-foot covered bridge in Lyndonville, Vt., which was about 100 years old. A new road was being put through and we had to haul the bridge off the river, move it about a mile up the road and put it back across the river. That was 13 years ago and ever since we've been involved almost exclusively with covered bridges in one way or another."

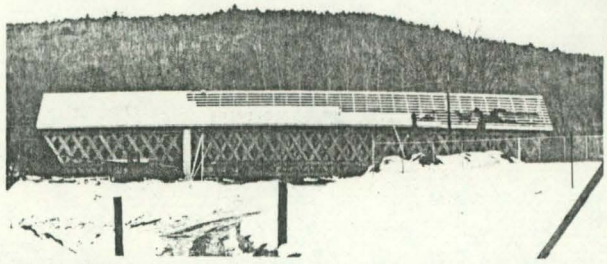
Arnold Graton, 35, the eldest of the three Graton sons, has been a bridge builder since he graduated from high school. Together he and his father form Graton Associates, Inc., and handle the bulk of the work alone.

"You have to keep it down to a small operation in order to control the quality of the work," Graton notes.

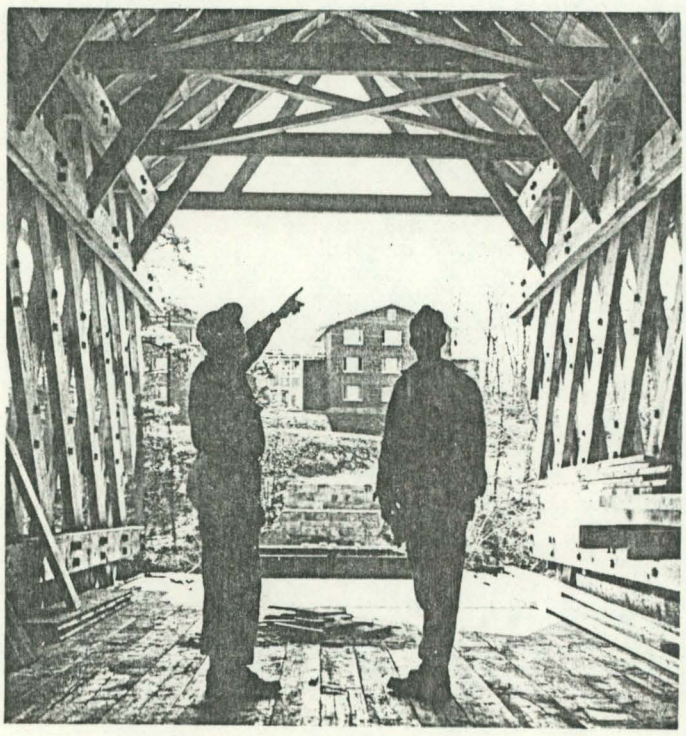
Photographs by Barry Proctor and Tim Savard



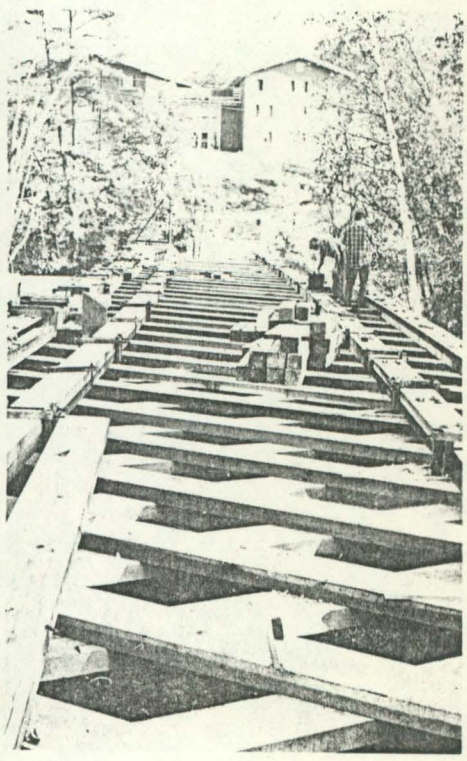
Truss in process of being jacked to standing position. When it was erect, it was braced and construction of the second truss began.



Bridge at the half-way point in construction.



The Gratons check roof construction details.



Inside of west side truss facing up. Compare with construction features shown in truss picture on previous page.

View of the west portal photographed from north bank of river.

In 13 years, Graton Associates, Inc. has left a trail of covered bridge restorations throughout the east, with the vast majority being done in New Hampshire and Vermont.

When New England College decided to construct an authentic covered bridge, it wasn't hard to find the builder. "The Gratons are the ones," college officials were told, "they're the only ones who can handle the job." The Gratons started the New England College/Henniker bridge in May, 1970 and everything about it is authentic.

Made entirely of wood, the span was the first authentic covered bridge in New Hampshire in more than 100 years and the scene was something out of the 1800's, right down to the team of oxen used to drag the bridge across the river's narrows.

NEC/HENNIKER COVERED BRIDGE

Facts and Figures

The Bridge spans the Contoocook River

Bridge Type: Town Lattice
Length: 150'
Clear Span: 124'
Weight: 90 tons
Clear Height: 14' 4"
Clear Width: 14' 4"
Wood Used: 71,000 board feet
Nails Used: 800 lbs.

TIMBER:

Five types of wood were used in the bridge: Douglas Fir, Hemlock, White Oak, Cedar and Pine.

The two trusses and the floor joists were fashioned from 53,000 board feet of Douglas Fir from Oregon. A shipment of 47,000 board feet arrived by rail directly from the west coast and 6,000 board feet was purchased locally.

The flooring was fashioned from 5,000 board feet of native hemlock. Four-inch planks were used.

The portions of the floor which feel the wear of auto wheels was made from 4,000 board feet of native oak. Four-inch planks were used.

The rafters were made from 5,000 board feet of native spruce.

The shingles for the roof are half-inch white cedar from northern Maine. Each shingle is three feet long and it took 48 squares of shingles to cover the roof. One square measures 10' x 10'.

To board-up the bridge sides, 4,000 board feet of old-growth native pine was used.

TOWN LATTICE TRUSSES:

The bridge has two trusses, each weighing 19 tons. There were 140 full pieces used in both trusses. Each piece is 24 feet long, with 70 pieces measuring 3½" x 12" x 24' and 70 pieces measuring 3½" x 14" x 24'.

The Town Lattice was first developed in 1820 by Ithiel Town of New Haven, Conn. The truss, made up of criss-crossing planks is one of the most efficient ever used in covered bridges.

TRUNNELS:

Trunnels, or tree nails, are huge wooden dowels used to tie together the lattice work, as well as roof and floor chords.

The trunnels in the NEC/Henniker bridge were made from native white oak. A total of 1,080 were used. All trunnels measure two inches in diameter. Three lengths were used:

27 ½" – 200 were used below the floor.
24" – 600 were used in the roof, floor and intermediate chords.
11" – 280 were used in the lattice work.

ABUTMENTS:

Approximately 400 granite blocks of various sizes (18" x 18" x 4' up to 18" x 18" x 8') were used in the two abutments. The 200 tons of granite came from two covered bridge abutments and an old railroad bridge abutment further downstream. The bridges have long since vanished but the abutments remained, a mute monument to another day.

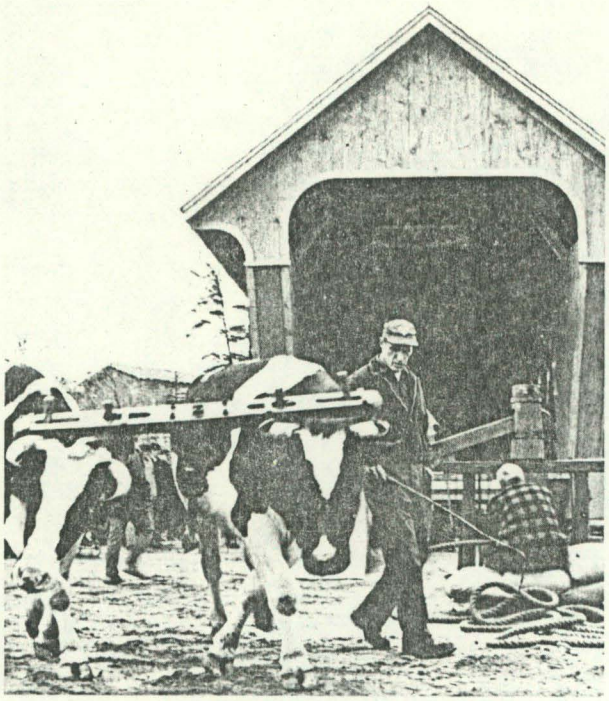
MISCELLANEOUS:

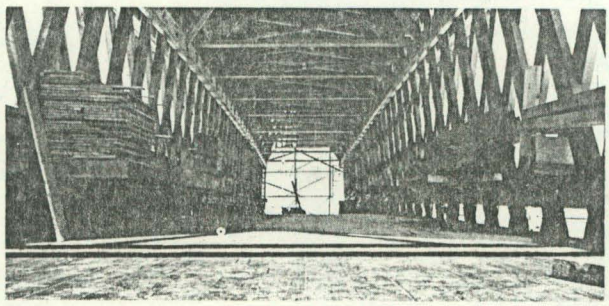
The bridge sits 20 feet above low water.

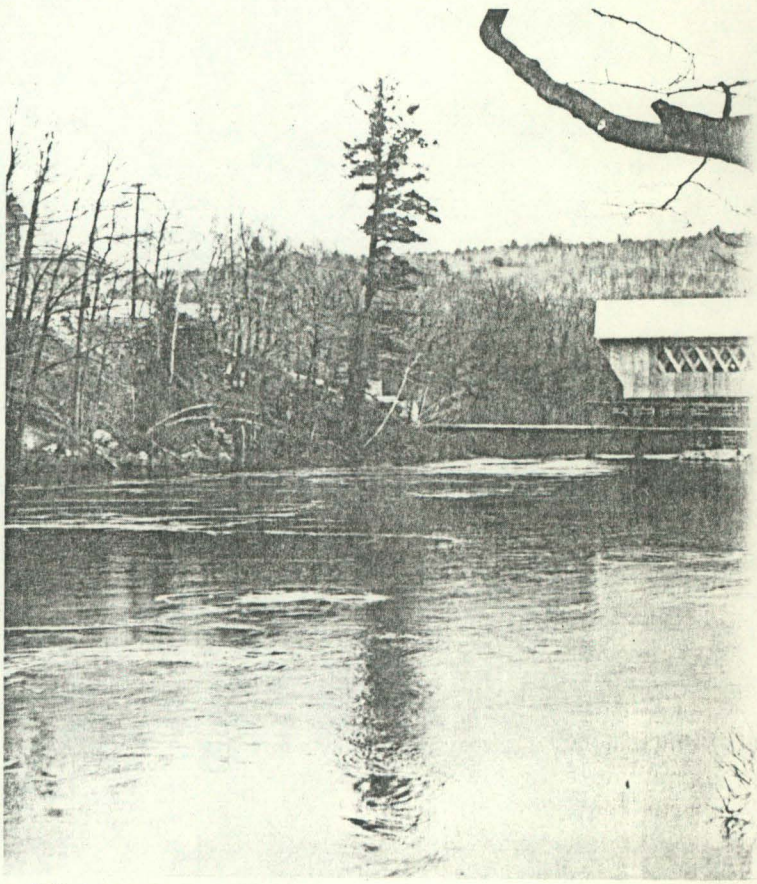
The largest single timber in the bridge measures 3½" x 14" x 42'. It is a chord member. There are eight such timbers in the bridge.

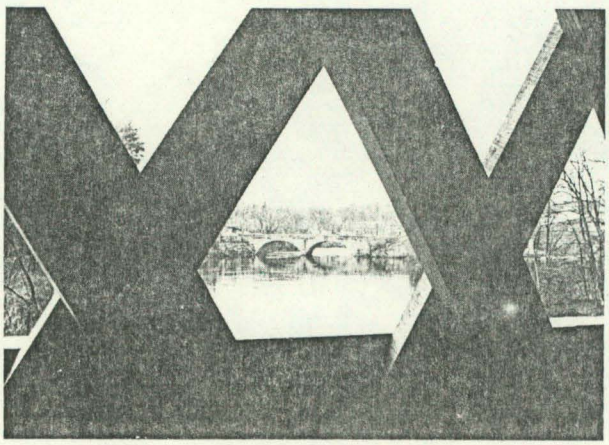
Nails were used for flooring, shingles and side boarding. The floor holds 400 pounds of nails.

To keep the project as authentic as possible, Donald Crane of Washington and his team, Stars and Stripes, turned the winch to pull the bridge across the river. The NEC football team (right) also took a few turns on the winch.



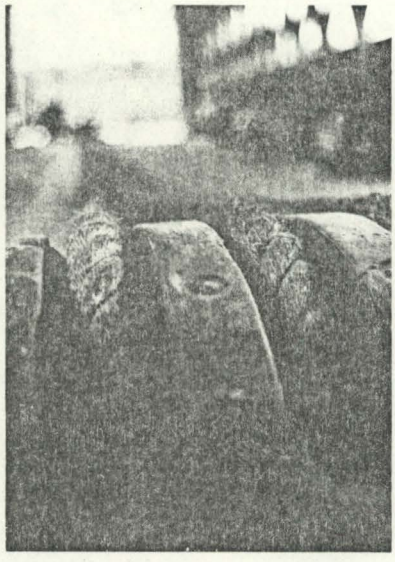




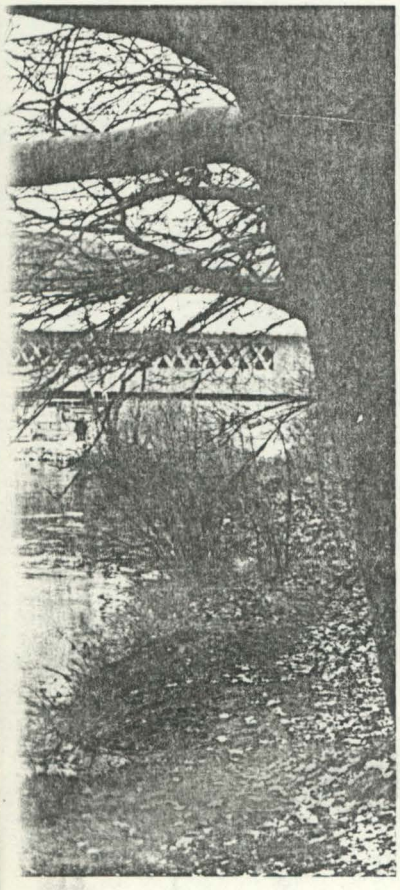


(middle above) Interior of the bridge from the south portal. (above) Picturesque stone arch bridge, 600 yards downstream, was the only way of crossing the river to reach both old and new campuses. (right) The completed bridge reaches the halfway point in its trip across the river.

This block and tackle was used to pull the bridge across the Contoocook.



The first pedestrians to cross the bridge on dedication day, May 13, 1972.



The two Town Lattice trusses, each weighing 19 tons, were fashioned on the north bank of the Contoocook from 47,000 board feet of Douglas fir shipped by rail from Oregon during the first week of June, 1971. Following eight weeks of curing, work on the first truss began, and one month later it was standing tall waiting for its mate to rise.

The Town truss, first developed and patented in 1820 by Ithiel Town of New Haven, Conn., is made up of criss-crossing planks and is considered one of the most efficient and durable ever used in covered bridges.

Perhaps the most unique aspect of the bridge lies in the fact that huge wooden pins or dowels called trunnels were used to lock the lattice work and supporting timbers in place. Trunnel is a corruption of the two words "tree nails," and 1,080 were put in the New England College/Henniker bridge.

With the exception of the roof framework, which was assembled in Graton's Ashland workshop, the entire bridge was built on the river's north bank from a total of 71,000 board feet of Douglas fir, hemlock, white oak, cedar and pine.

The two abutments were constructed from 400 granite blocks weighing approximately 200 tons. The granite was moved from further downstream where a covered bridge and a railroad bridge once stood. The bridges have long vanished but their abutments remained, a mute monument to another day.

"We've taken apart a lot of old bridges and the work of those old builders was flawless," Milton Graton said. "I guess I feel about wood the same way they did. I'm fond of wood and anything that's old, too, from a mummy case right down to a packing crate."

And as he spoke of covered bridges and his work, Graton passed a confident hand across a timber. "A man who can't communicate with a piece of wood better leave it alone," he said.

And looking at his bridge, you know there's no language barrier.

STATE OF VERMONT
County of Windham
Town of Townshend

The undersigned Selectmen of the Town of Townshend in the County of Windham hereby give notice that the covered bridge known as DeCelle or Mill Bridge on the road leading westerly from Route 30 to the DeCelle property will be permanently closed on May 16, 1960, and on that date the United States Government will commence removing the bridge for storage until such time as the Historic Sites Commission can relocate it.

Done at Townshend in said County this 2nd day of May, 1960.

Aubrey E. Stratton

Lawrence Fisk

Claude A. Shine

Selectmen

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM 54, MASS.

ADDRESS REPLY TO:
DIVISION ENGINEER

REFER TO FILE NO.

NEDGW

4 December 1959

Mr. Frederick N. Cook, Supervisor
Historic Sites Commission
Montpelier, Vermont

Dear Mr. Cook:

Reference is made to your letter dated 25 November 1959 asking when dismantling operations will start on the Covered Bridge on Tannery Brook Road, West Townshend, Vermont.

The dwellings for which this bridge provides access, have been vacated by their former occupants. However, two of these dwellings are to be dismantled and moved across the bridge.

For this reason the dismantling of the covered bridge has been postponed until the spring of 1960. It is estimated the start of the work may be as late as 1 June 1960.

A copy of your letter is being forwarded to our Area Engineer in charge of construction operations and he will notify you before the work is started so that you may make arrangements for a photographer to take pictures of the dismantling operations.

Very truly yours,

John W. Leslie

JOHN WM. LESLIE
Chief, Engineering Division

Write Audrey Stratton

BILL OF SALE

KNOW ALL MEN BY THESE PRESENTS, in consideration of One Dollar ($1.00) and other valuable consideration paid to the State of Vermont, a sovereign State, the capital being Montpelier, by the Weston Community Council, Incorporated, a Vermont Corporation of Weston, Vermont, the State of Vermont by its Purchasing Director and with the approval of the Governor and the Board of Historic Sites does hereby sell, transfer, assign, make over and deliver all its right, title and interest in and to certain personal property consisting of lumber stored on the premises of Aubrey Stratton in the Town of Townsend, said lumber being a dismantled covered bridge which was given to the State of Vermont by the Town of Townsend.

The State assumes no responsibility because of removal, transfer or re-erection of said bridge.

TO HAVE AND TO HOLD to the Weston Community Council, Inc., its successors and assigns, for its own use and behoof forever.

Dated at Montpelier, Vermont this 10th day of September 1962.

By Richard C. Raymond
Purchasing Director

Approved:

[signature]
Governor

Edward J. Conlin

R R Vaulour

William Hebbard

Arline Pat Hunt

Richard G. Wood
Board of Historic Sites

Approved as to form
Charles E. Gibson, Jr.
Deputy Attorney General

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TO HAVE AND TO HOLD to the Weston Community Council, Inc., its successors and assigns, for its own use and behoof forever.

Dated at Montpelier, Vermont this 10th day of September 1962.

By Richard C Thrasher
Purchasing Director

Approved:

Governor

Edward J Conlon

R R Vaughan

William H Hart

Arline Pat Hunt

Richard G. Wood
Board of Historic Sites

Approved as to form
Charles E. Gibson Jr.
Deputy Attorney General

xxxxxxxxxxxxxxxx

, Chairman

xxxxxxxxxxxxxxxxxxxxxxxx

Glendon B. Crane
W. E. Bermingham, Ex-Officio

February 26, 1960

Mr. Kent Bromley
Newberry
Vermont

Dear Mr. Bromley:

It has come to my attention that there is considerable interest in your locale for the preservation of a certain covered bridge which spans the Connecticut River between S. Newberry and Haverhill, N. H.

I have further learned that an article will appear in the Warning for Town Meeting which, if approved, conditionally appropriates a sum of money for repair of this same bridge.

My interest for writing is to express this Commission's appreciation in the work being done by your local group, seeking to preserve one of a rapidly deminishing number of covered bridges in this State.

It is through the co-operative action of individuals like yourself that Vermont will retain its magnificent heritage which has been so uniquely hers since the signing of the 1777 Vermont Constitution. For you will recall that it was this momentus document, the first of its kind to provide for universal manhood suffrage, which played so great a part in the history of our country.

If success does not come the way of your group from its current efforts, I might suggest the formation of a local historical society, or an inter-town or county development group to accomplish such a goal.

With sincere wishes for every success, I am

Cordially yours,

Frederick N. Cook
Supervisor of Historic Sites

FNC/1

HISTORIC SITES COMMISSION

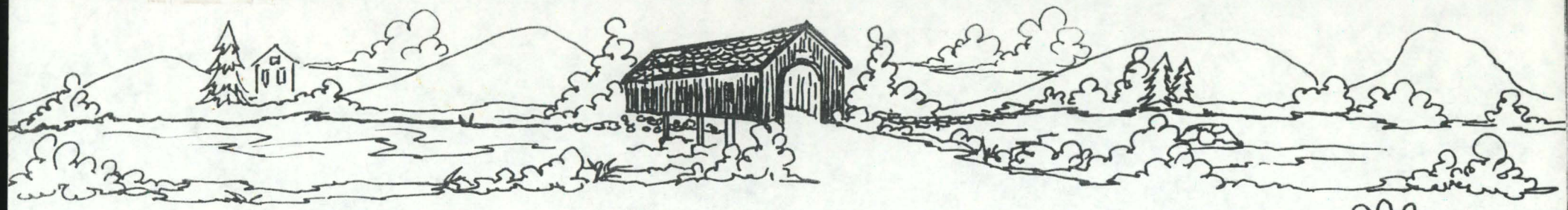
MEMORANDUM

TO:

FROM:

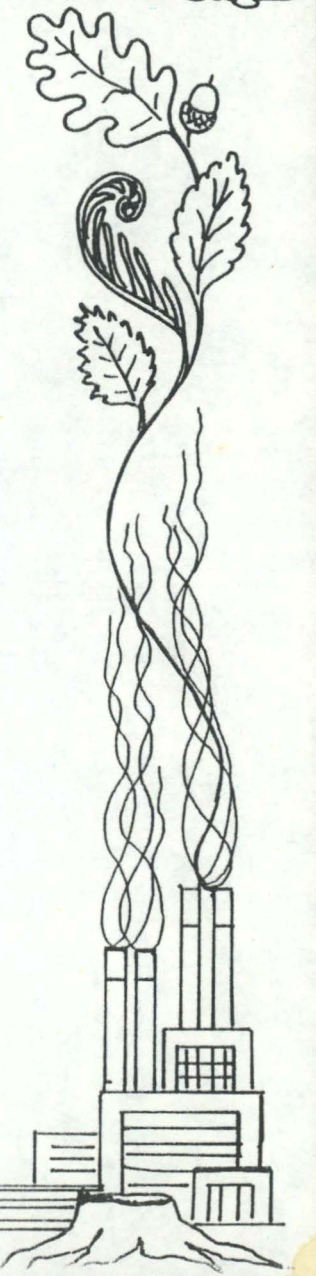
DATE:

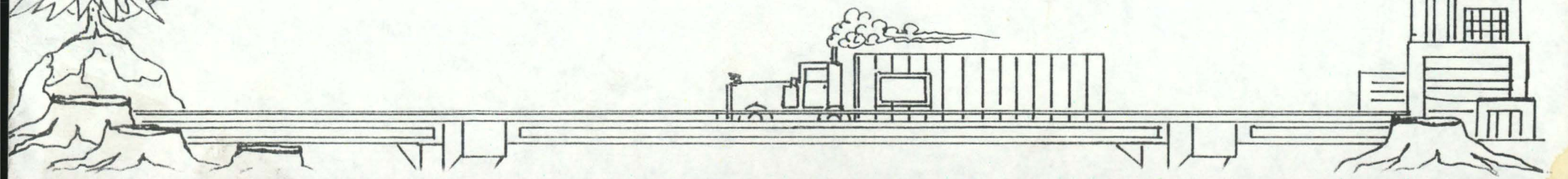
SUBJECT:



THE LITTLE RIVER AND THE BIG, BIG BRIDGE

Joan Turbek





North Country Books, Inc. Utica, New York

Library of Congress No. 93-25968

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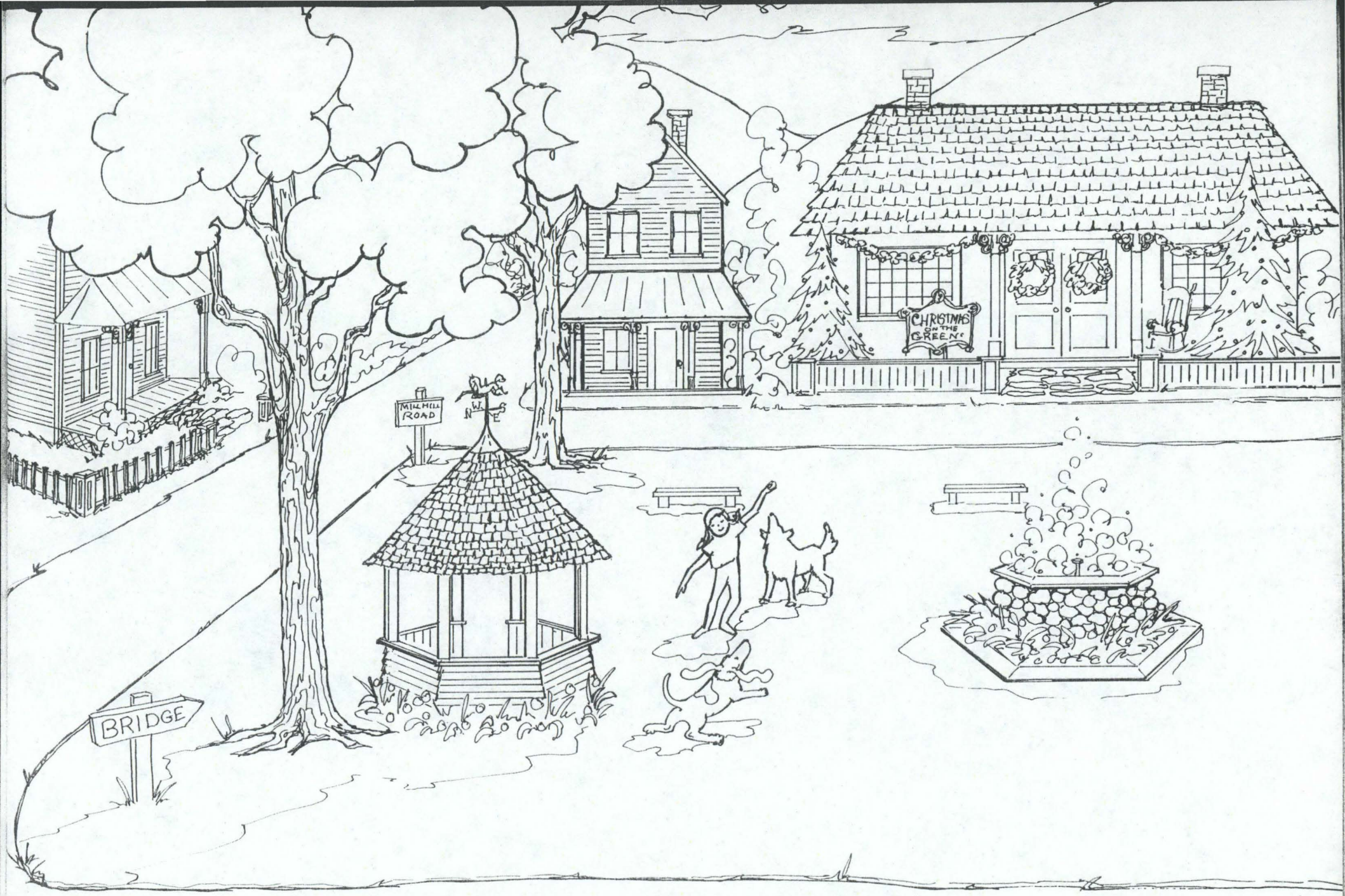
DEDICATION

To the people of the Adirondacks who love and care for their home.

Special thanks to all those who have volunteered to help with this book, especially Kathy Recchia, Fred Balzac, Rita Cartella and Joe Ascherl.

Once there was a little river. It ran through a very little town. There was a little girl named Becky who lived in the town, next to the river.

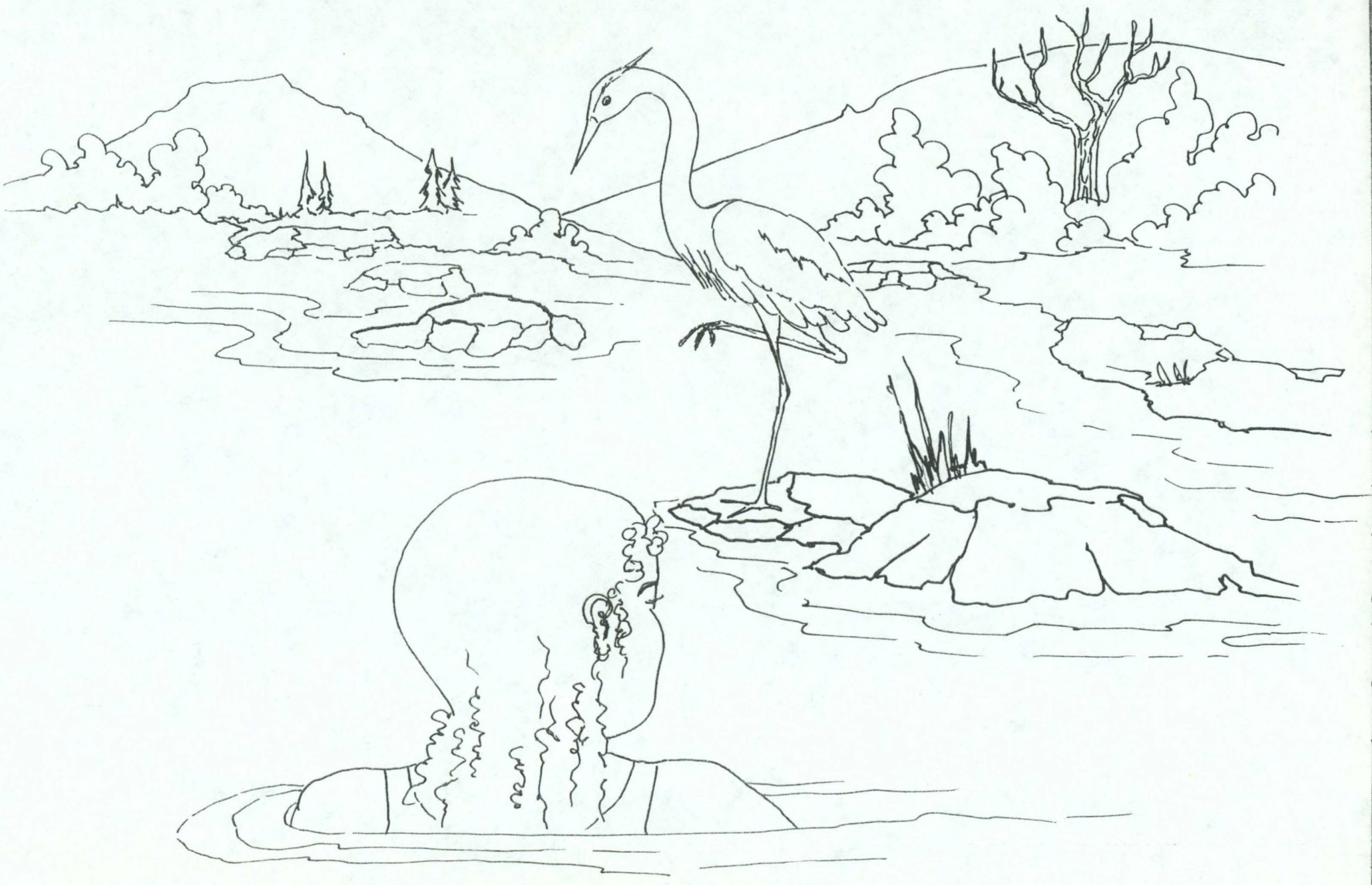

MILL HILL ROAD
BRIDGE
CHRISTMAS ON THE GREEN

She saw it from her window in the morning. It whispered in her ear when she was going to sleep at night.

Every afternoon in the summer she went to the rocky place and swam in the deep pool the river made, before it fell like a clown, somersaulting and jumping down the rocks.

One day some men came. They said they must build a bridge there. The old bridge was too small and old. The big trucks must get to the mill so they can sell their goods and make more money. And then they hire more men from the town – so we're doing the town a great favor. Don't you see, Becky?

But what about our swimming place and the heron
who stands on one leg on the rock and stares at me?
He comes back every year. Will he stand under
the bridge?
He can find another rock.



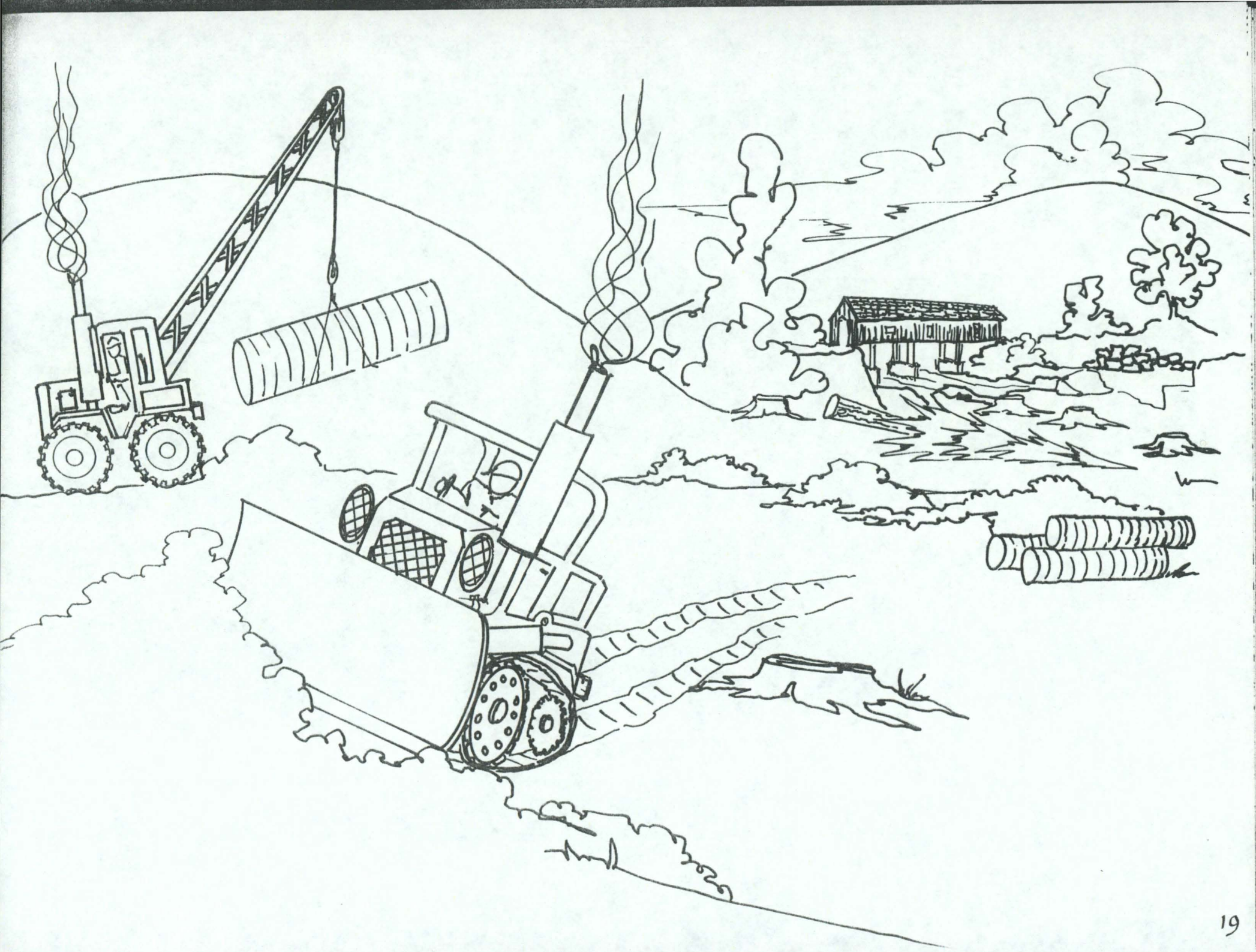
What about the spot where I lay, when just before Mom calls me for supper, I can see the mountains upside down in the river and the bugs jump 'cause the fish are chasing them – and if I hang off the rock upside down, then the mountains are right side up again.

You can find another rock.

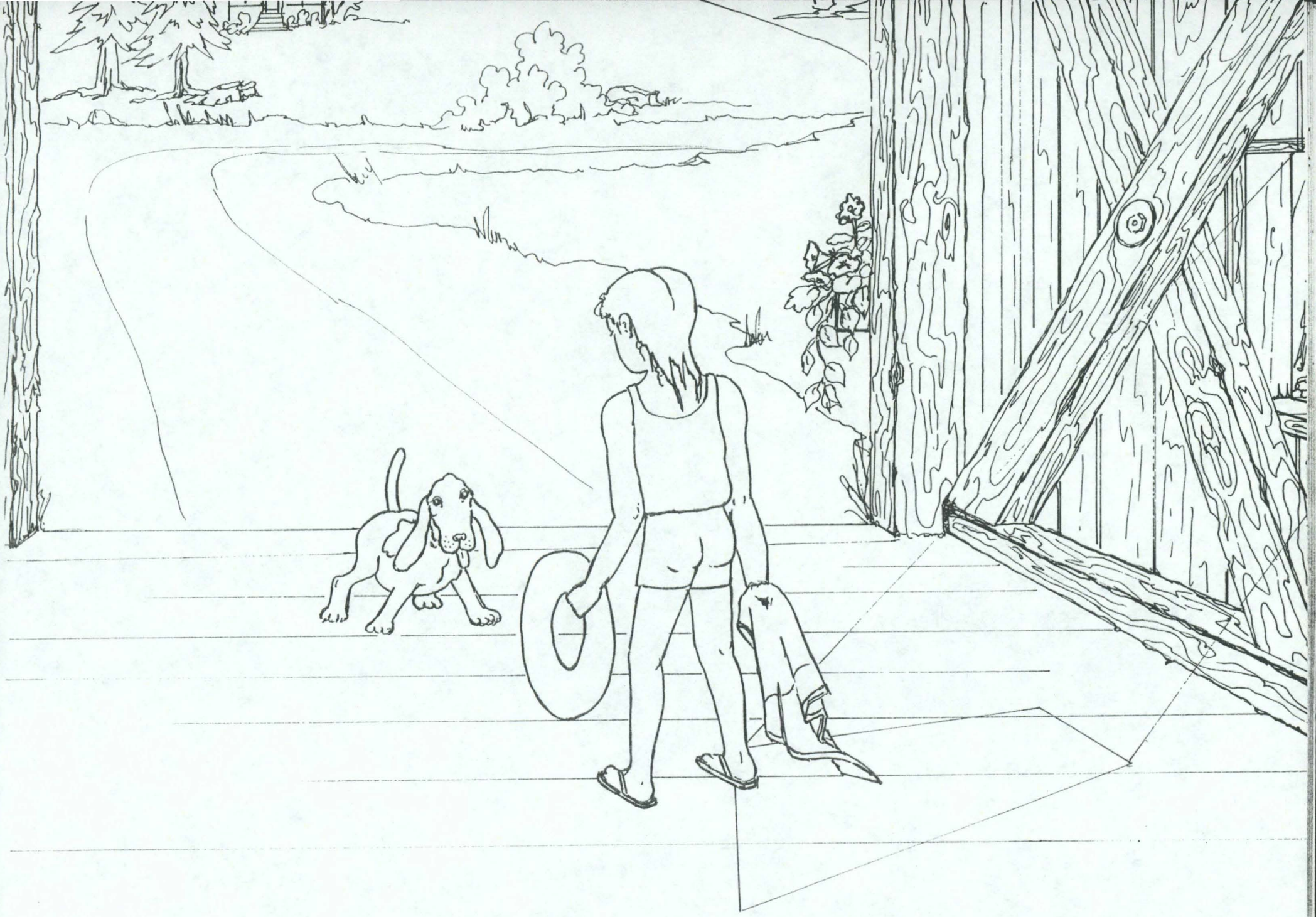
What about the little stream that trickles into the river there? If I stay still in the water it sounds like the river is laughing.
Oh! We'll take care of that stream – we'll backfill and put in a culvert – don't worry – it won't interfere with the bridge.

But where will I swim?

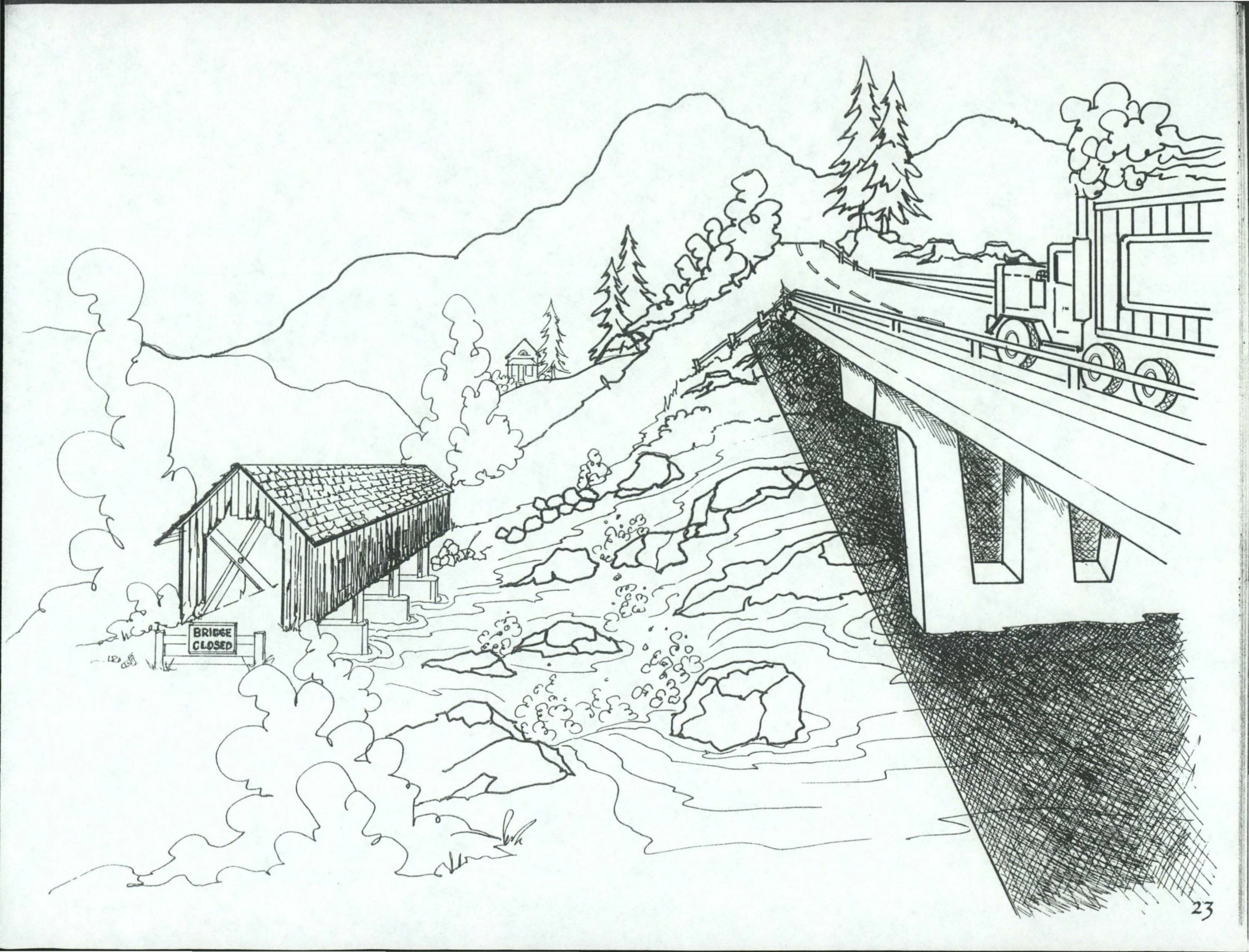
You can still swim under the bridge, just don't mind the rumbling of the big trucks and the smoke and the shadow they cast. Remember the mill will make more money - your town will be richer. We've done surveys - they're official - we know! We're doing you a great service. We're bringing you progress!



Becky went home sad. She was confused. The men had the papers and they were official. They told her the new bridge would make the town richer. But her heart told her that somehow it wouldn't be better.



The bridge was built and the mill did expand.
It automated and laid off one third of its workers.
The one store in town closed because the tourists
stopped coming to swim and take pictures of
the beautiful swimming hole.


BRIDGE
CLOSED

Could there have been another ending?

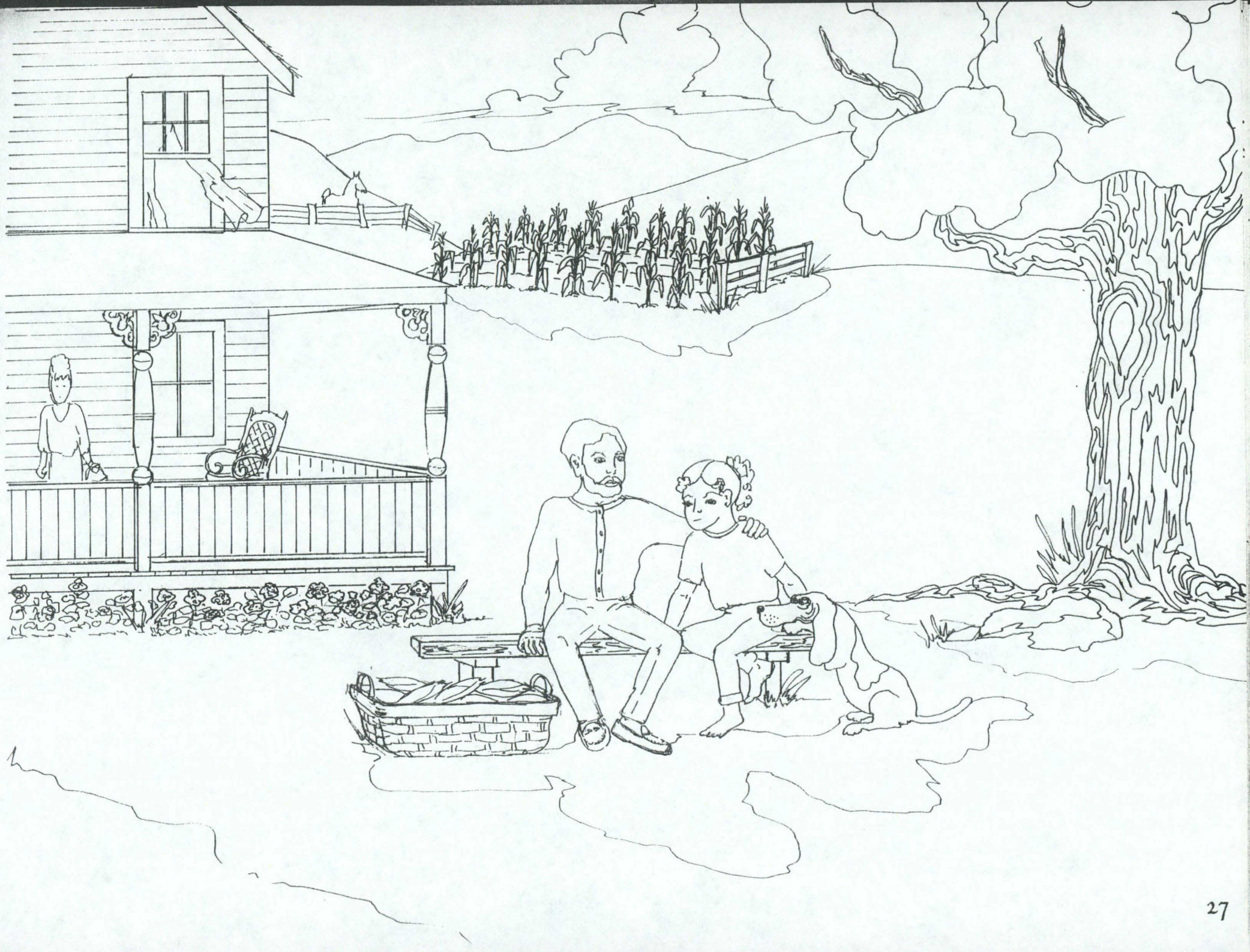
Yes, read on.

When Becky's father saw her face he asked what was the matter?
She said, Daddy, why do they have to build a bridge there?

Because they say it's the best place. The government has experts. . . they know.

What do they know, Daddy?

Well, they know "alignment" and "height requirements" and "load factors" and "approaches" and. . .



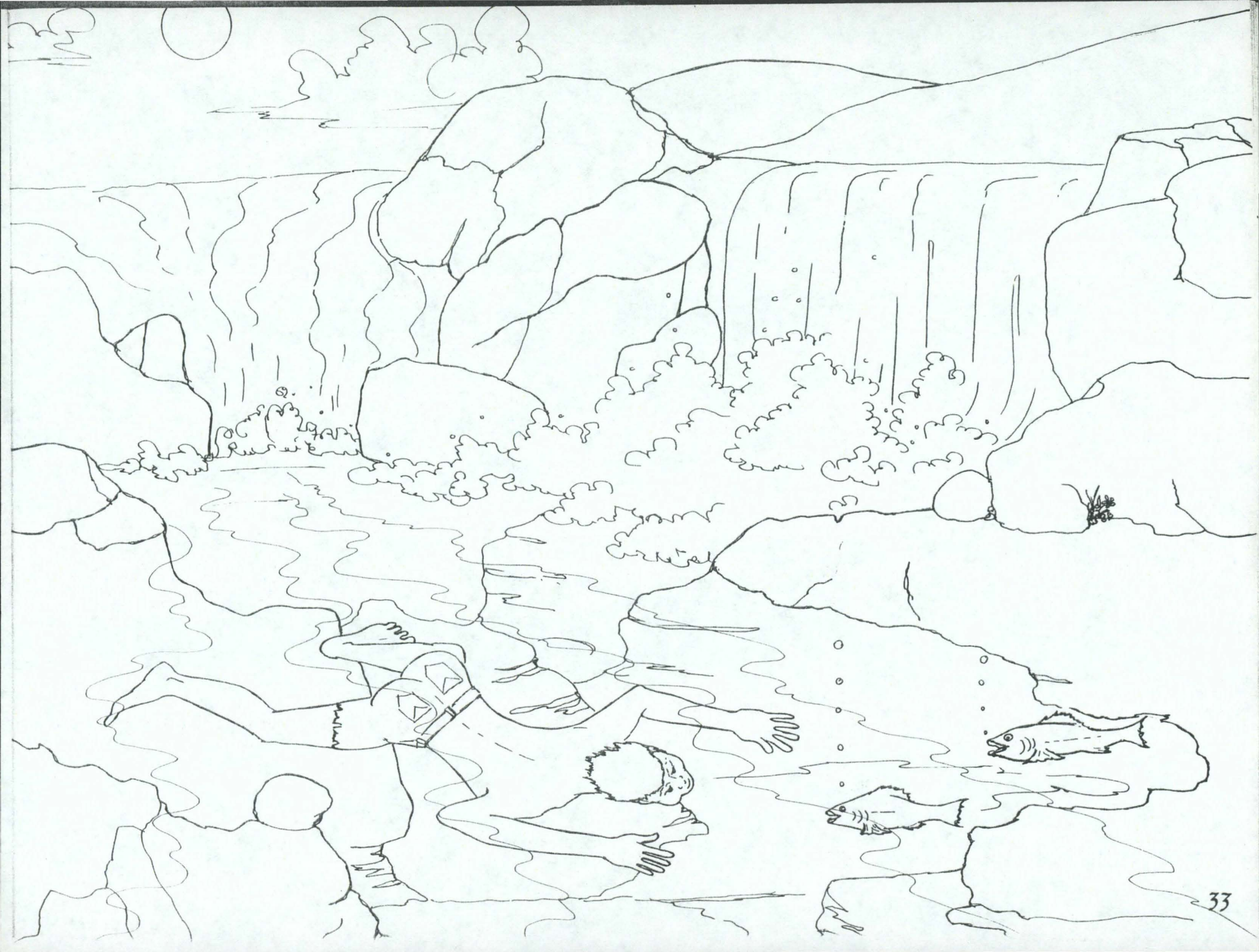
But do they know how to lay still on the rocks and look at the mountains, or how to pretend they are a frog sitting in the pool with only their eyes above water, or how to swim in the bright clear water with the sun shining through.

Well, no. . . maybe they don't know those things.

Then maybe we have to teach them, so they can figure out a better "best" place for the new bridge.

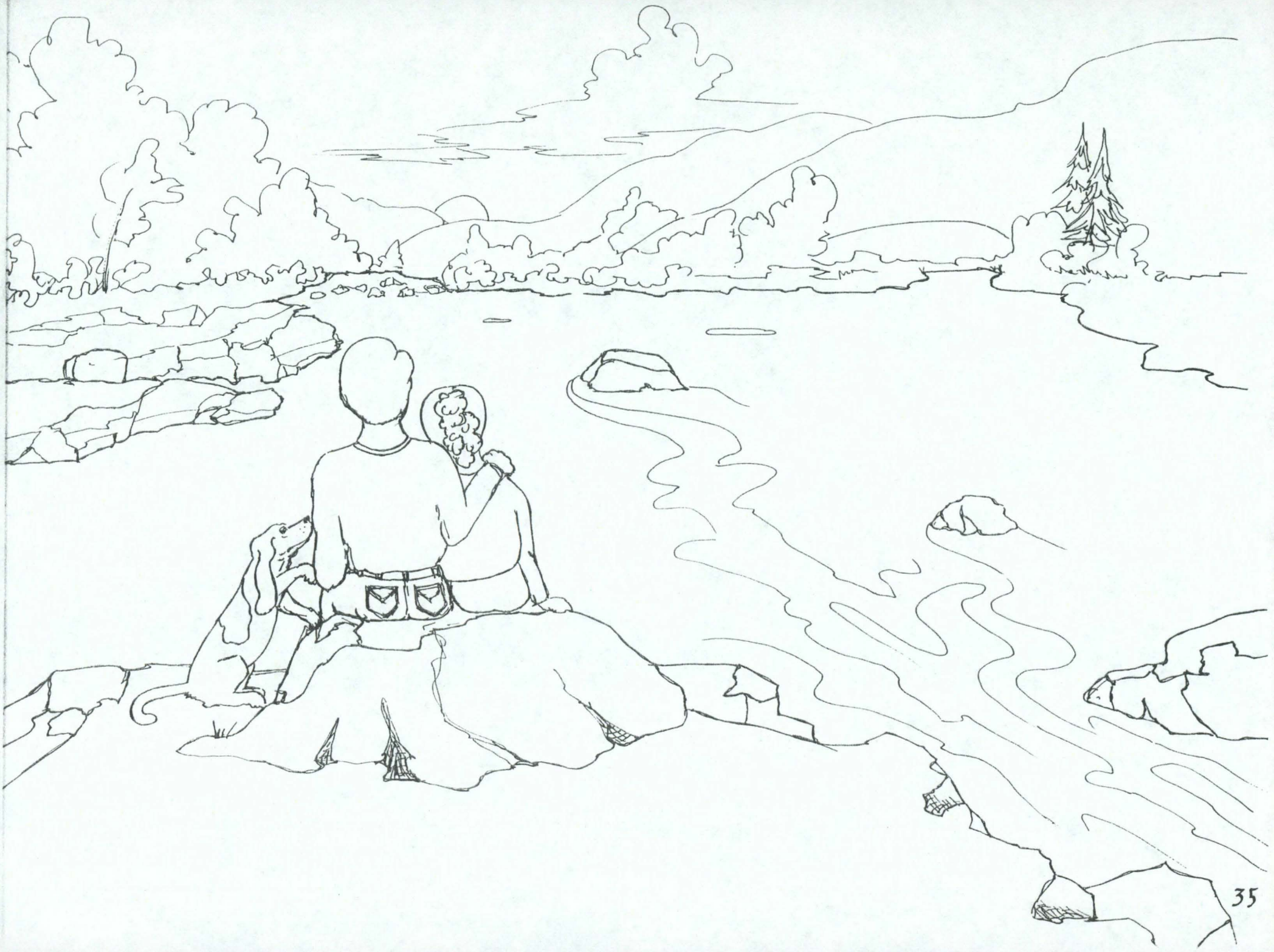
Becky's father started thinking about what she had said. After all it would be these young ones who would have to live with what was done now. Maybe we ought to think about living in this town instead of just making a living here. It would be sad to lose the swimming hole. He remembered when he was between a boy and a man.

He spent his days there, challenging the rapids, sliding down the rocks like an otter, leaping up and diving into the foaming pool, swimming under the rock shelf, eye to eye with the rainbow trout. He was trying very hard to impress Janey and the other girls. He guessed it worked because after high school when he went to work in the mill, Janey agreed to marry him.

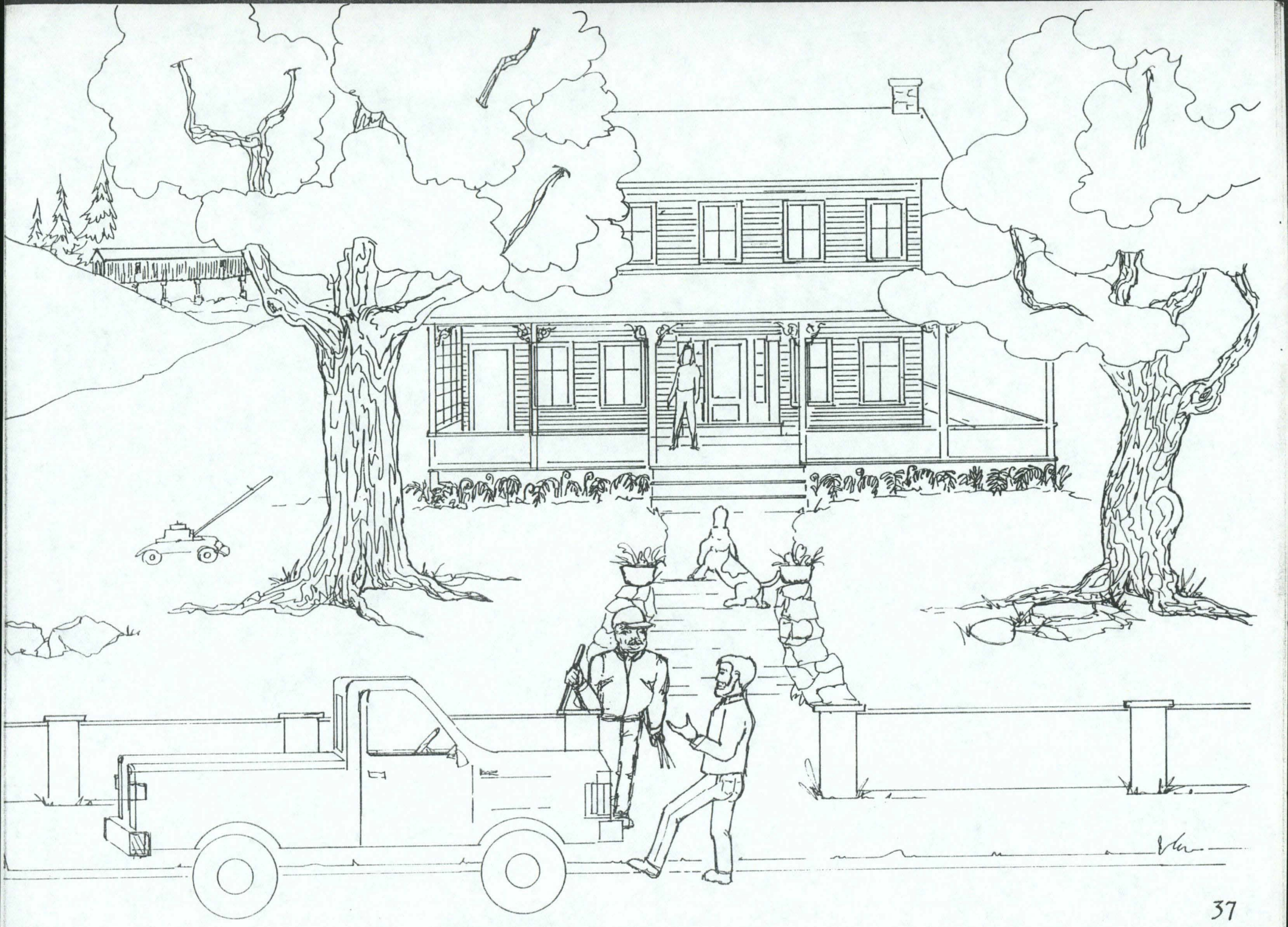


He remembered the nights sitting on the rocks with her quietly by him watching the sun go down between the two mountains. Now all that would be gone.

The place where they laid Becky on her blanket on the rocks when she was a tiny baby, that would be covered by the bridge. The place where Becky and he and Janey and his Pop and most of the town were first launched into the river to learn to swim, that would be gone too.



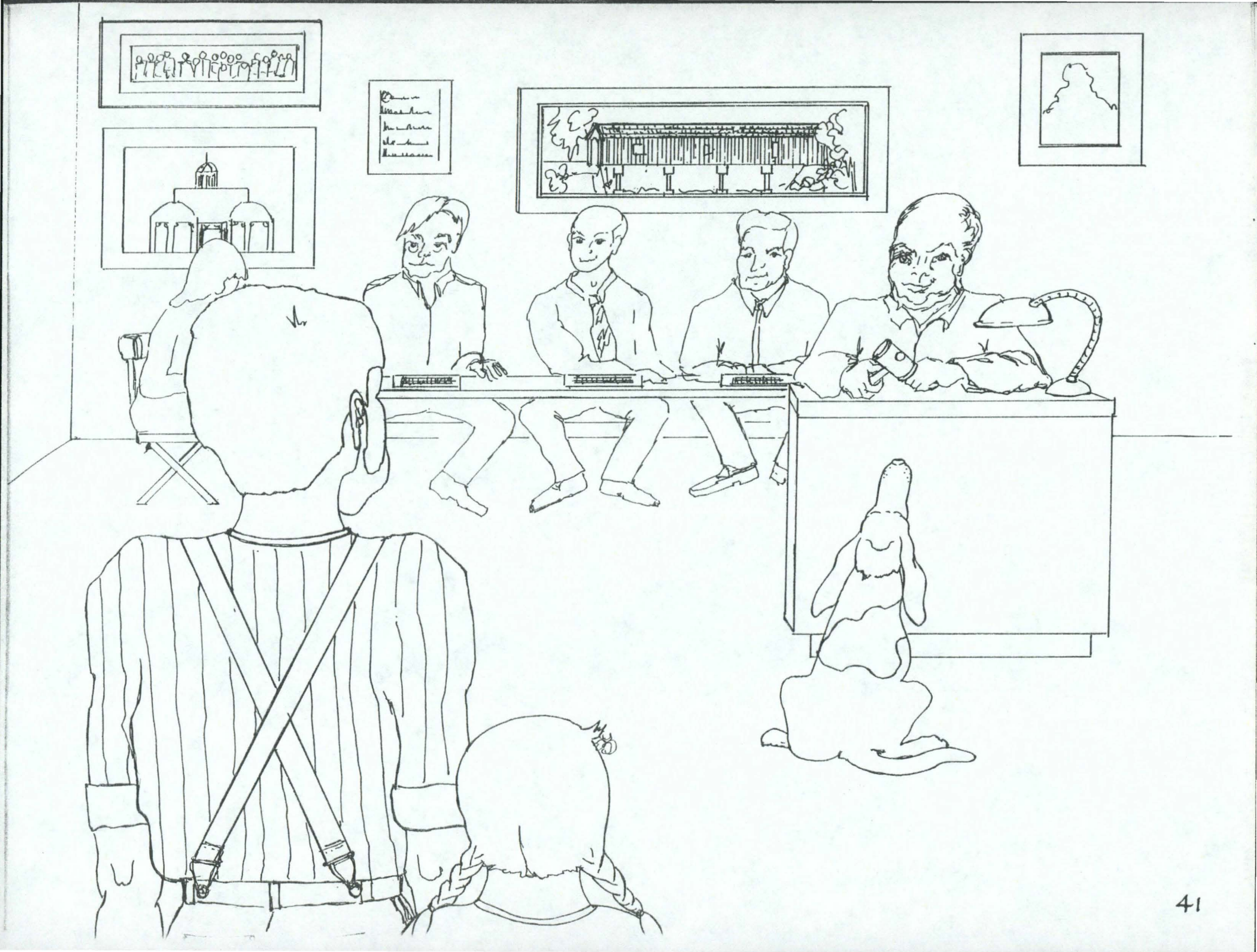
If he felt this way about the swimming hole maybe other folks in town did too. If they got together maybe they could stop this bridge. He talked to a lot of people the next week. He stopped by all the houses on Main Street. No, they didn't want the bridge but what could they do to stop it?



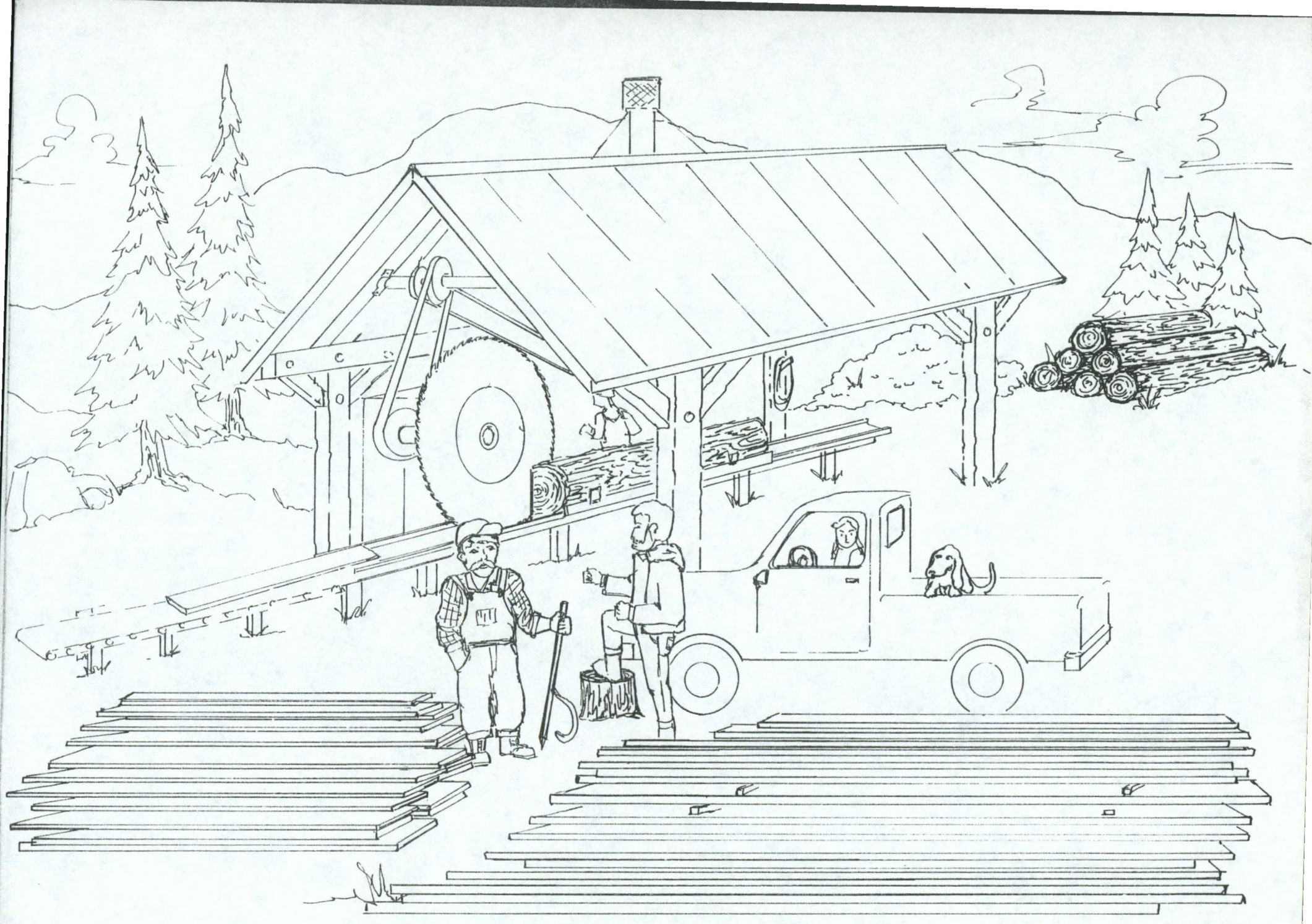
When he went to McDougall's General Store he talked to Chester and Ben and Mel. Same thing, it seemed like nobody wanted that bridge but nobody knew how to stop it either.
Why not bring it up at the town meeting?...
Suggested Ben.


POST OFFICE

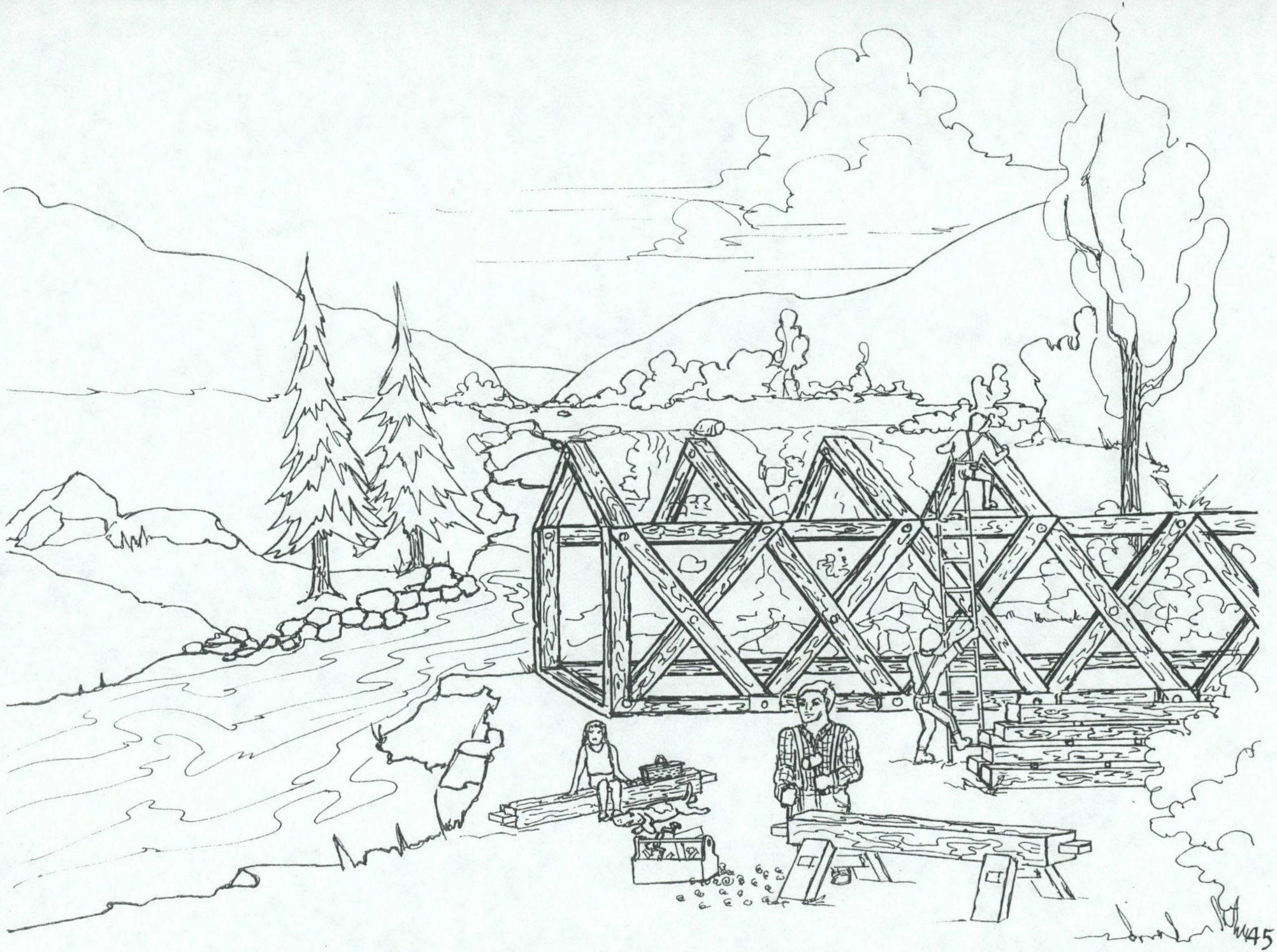
So Becky and her father went to the town board. They were very important men in town. They could stop the new bridge. Mr. Wells, the Board's Chairman asked, "Why would you want to stop progress? This is progress, it will bring money into the town."
Becky spoke up... can't we have a little less money, and leave us our swimming hole and our heron and our trout and our warm rocks to slide on? Isn't that worth more than money?



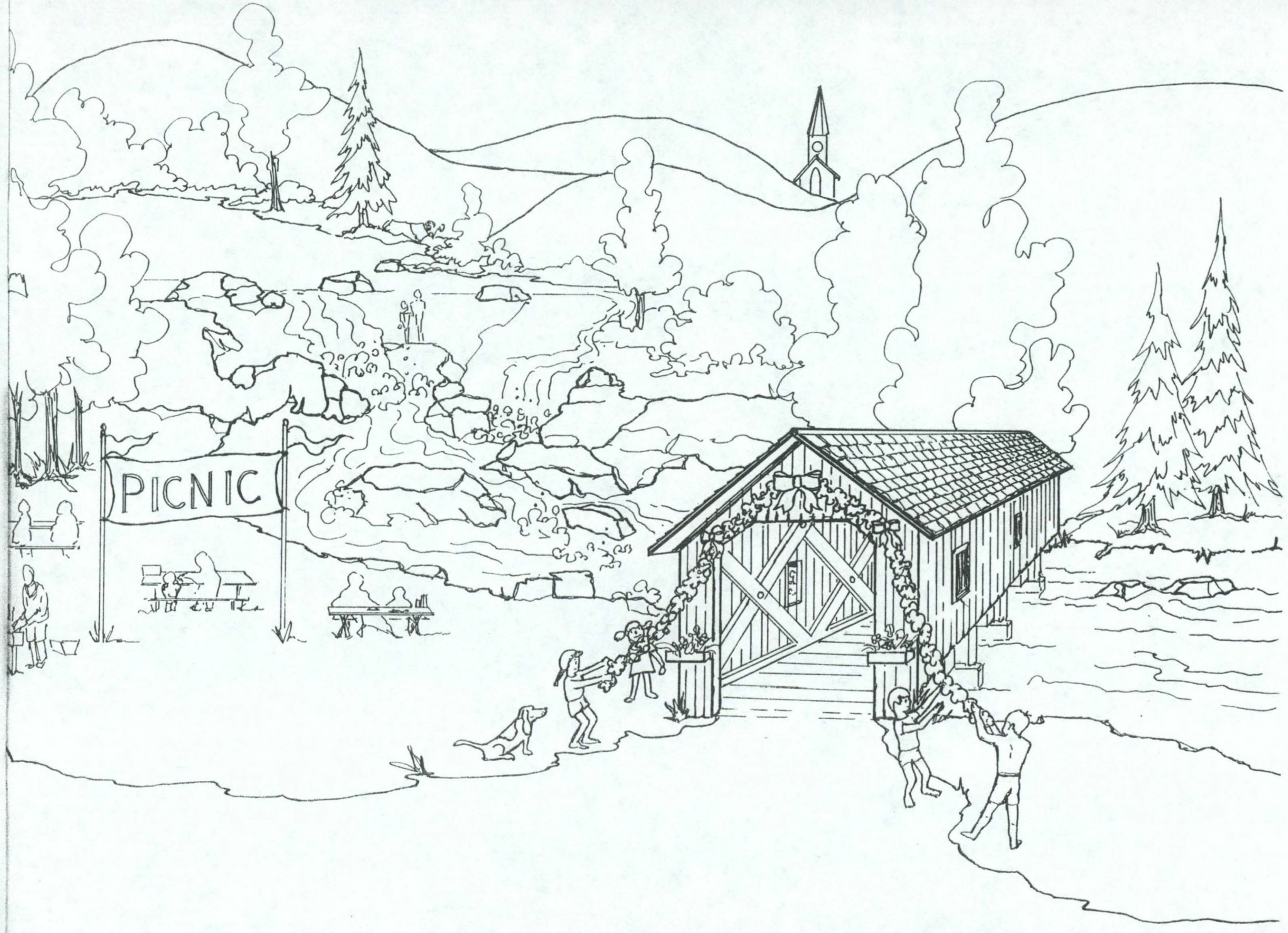
Joe Beckett spoke up. Why don't we tell the government men that we don't want their bridge? We survived in these mountains because we can do things for ourselves.



Yes, the old bridge needs work, but we can rebuild it ourselves. Then we'll have a bridge and we won't lose our swimming hole. My sawmill can cut the timber we need. Dan here, knows how to notch them the way they used to do it. The town can hire our own people to do the labor.



A shout went up! Yes, we'll work together like the town used to. We can do it! And they did!


PICNIC

To learn the true story behind this book please
write to: The Bridge and Beyond, Inc.
P. O. Box 164 Jay, N Y 12941

STATE OF VERMONT

AGENCY OF DEVELOPMENT AND COMMUNITY AFFAIRS

OFFICE OF THE SECRETARY (802) 828-3211

MONTPELIER, VERMONT 05602

DEPARTMENTS OF:
Economic Development 828-3221
Housing & Community Affairs 828-3217

DIVISIONS OF:
Administration 828-3231
Historic Preservation 828-3226
Vermont Travel Division 828-3236
Vermont Life Magazine 828-3241
Outdoor Advertising 828-3215
Research & Planning 828-3234

12 April, 1977

Mr. Peter Benton
Public Relations
First Vermont Bank
Brattleboro, Vermont

Dear Mr. Benton:

Under separate cover I am returning the film on covered bridges. It has been viewed with pleasure and admiration by many people.

It gives a good explanation and exposition of one of Vermont's great assets.

The showing in Washington was applauded. Many had no idea of the significance or numbers of covered bridges.

Thank you for the opportunity to show the film--we may ask for it again.

Sincerely,

Eric Gilbertson

Eric Gilbertson
Assistant Director

sn

GFV

Covered Bridge

HIGHWAY DEPARTMENT RECEIVED APR 2 2 1977 **OFFICE MEMORANDUM**

TO: File

FROM: Wendell M. Smith, Bridge Engineer WMS

DATE: April 21, 1977

SUBJECT: Lunenburg C/2 TH 4 Connecticut River Covered Bridge (Mt. Orne Bridge)

Representative George Mullin of Concord, New Hampshire called to tell me that Lancaster, N. H. is applying for funds from the National Park Service for restoring this bridge. He has also contacted William Pinney of Vermont Historic Sites to see if the Town of Lunenburg would like to do the same. Mr. Mullin is a member of the Interstate Cooperation Committee and that is his interest in this bridge.

This bridge will be a part of the 1977-78 Town Highway Bridge Program for Lunenburg's share of the restoration. The estimate for the Vermont share is $8,000. There is a possibility that this application will delay the construction work but, hopefully, it can be done this year.

We will work with Mr. Pinney on this application.

WMS:fm
cc: R. E. W. Crisman, Acting Commissioner
E. H. Stickney, Chief Engineer
R. O. Munn, Ass't Chief Engineer
H. F. Elder, District 7 Engineer
William Pinney, Historic Sites

Covered Bridges

STATE OF VERMONT

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May 25, 1977

Mr. Robert Merchant, Commissioner
Department of Bus, Rail, Waterways
and Motor Carrier Services
Agency of Transportation
State of Vermont
Montpelier, Vermont 05602

Dear Mr. Merchant:

It is my understanding that the roof on the Fisher Covered Railroad Bridge at Wolcott is in such need of replacement as to be possibly endangering the structure.

Mr. Roger Martin of Vermont Weather Board in Wolcott called to tell me that he believes that Bruno Loati of the Morrisville Lumber Company will donate all necessary roofing materials if your department or the railroad will pay the labor for a roofing job.

I would appreciate your letting me know what can be done about this and if I can be of assistance.

Sincerely,

William B. Pinney

William B. Pinney
Director
State Historic Preservation
Officer

WBP/sf

STATE OF VERMONT

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Sincerely,

William B. Pinney

William B. Pinney
Director
State Historic Preservation
Officer

WBP/sf

Bruno Loati

Morrisville Lumber Co

Will donate shingles for

Walcott R.R. Bridge

---

called Chrisman 5/19

TELEPHONE MESSAGE

While you were out

To: Mr. Penney

Mr/d. Roger Martin

Of: Hardwick

Date: 5/18/77 Time: 10:00

Phone No.: 472-5543 Extension:

- ☐ PLEASE CALL
- ☐ CALLED TO SEE YOU
- ☑ TELEPHONED
- ☐ WANTS TO SEE YOU
- ☑ WILL CALL AGAIN
- ☐ WISHES AN APPOINTMENT

MESSAGE: around 2:00 this afternoon. Re: Quote - "The only Covered Bridge in the State of Vermont".

PERSON WHO TOOK MESSAGE: Sharlene

AA-PUR-106

Take advantage of this opportunity to generate high-quality sales leads from substantial companies who can buy your products and/or services in the kind of volume that really increases your bottom line.

Reserve space in the August DUN'S REVIEW "Industrial Equipment Planner" section. Closing date is July 1. Use the enclosed card for your reservation or for more information.

Send the card in today!

Cordially,

Robert A. Potts
Publisher

RAP:eh
Encl.

Vt. Northern R.R.

Bob Merchant, Commissioner

Dept Bus, Rail
Waterways + Motor
Carrier Services

Vt. Agency of Transport.

VERMONT STATUTES ANNOTATED.—61

§ 1623. —Vote at town meeting

In case such limitations proposed by a selectman of a town, or of each town concerned, are not approved by the selectmen and district highway engineer as provided herein, said selectman or selectmen of the town or towns wherein the bridge is located shall have the right to place the question in the warnings of the next town meeting, annual or special. When the bridge is located in more than one town, said limitations must be adopted by each of said towns and when so adopted, said bridge shall be posted according to such limitations.

HISTORY

Source. 1955, No. 197, § 2.

§ 1624. —Penalties

A person who operates a vehicle which exceeds the limit prescribed on a bridge thus restricted, shall be fined not more than $200.00 for the first offense and not more than $300.00 for each subsequent offense during one motor vehicle registration year.

HISTORY

Source. 1955, No. 197, § 3.

§ 1624a. Removal of covered bridges; notice

When the town officials or boards or state highway board having control of a covered bridge decide that its destruction or removal is necessary, whether by discontinuance of the highway or to replace it with another structure or for any other reason, notice of the intent to destroy or remove the bridge shall be posted by said officials or boards in three public places in the town where the bridge is located and published on two consecutive days in a newspaper of general circulation in said town and copies of such notice shall be sent by certified mail to the governor and the chairman of the board of historic sites not less than ninety days before destruction or removal is to be started, and the date of proposed destruction or removal shall be stated therein. The requirement for a ninety day warning shall not apply in the event of a serious emergency.—1959, No. 141, eff. April 22, 1959; amended 1959, No. 329 (Adj. Sess.), § 24, eff. March 1, 1961.

HISTORY

Amendments—1959 (Adj. Sess.). Substituted "board of historic sites" for "historic sites commission".

§ 1625. Maintenance of drawbridges by the state

When a town or corporation, owning or controlling a drawbridge and the abutments thereto in this state, conveys to this state all its rights, title and interest in such drawbridge and the abutments thereto, not exceeding thirty feet on each side of the draw in such bridge, the same shall be maintained and operated by the state, tolls free, under the supervision of the highway board. The board shall issue its certificates to the finance director for expenses incurred under the provisions of this section. The finance director shall issue his warrants in payment of such certificates, and such warrants shall be paid out of the highway appropriations.—1959, No. 329 (Adj. Sess.), § 8(a), (b).

HISTORY

Source. V.S. 1947, § 4990. P.L. § 4722. 1933, No. 157, § 4439. G.L. § 4518. 1912, No. 263. 1910, No. 142.

Revision note. "Auditor of accounts" and "auditor" changed to "finance director" pursuant to 1959, No. 329 (Adj. Sess.), § 8(a), (b). See note set out under § 182 of Title 32.

ARTICLE 3. TOLL BRIDGE COMMISSIONERS

§ 1711. Commissioners

By virtue of their office, the members of the state highway board shall be toll bridge commissioners.

HISTORY

Source. V.S. 1947, § 5237. P.L. § 4966. 1923, No. 7, §§ 4, 32 (Par. 3). G.L. § 4731. 1915, No. 254, § 1. 1912, No. 262, § 1.

Lake Champlain Bridge Commission Compact. Act May 11, 1927, No. 139, which created a compact between the states of Vermont and New York relating to the creation of the Lake Champlain Bridge Commission, was amended by 1963, No. 193, § 36, eff. June 28, 1963, and by 1963, No. 207, to provide, among other things, that members of the commission shall receive $15 a day for each day's service performed and in addition all necessary expenses, to be paid from the funds of the commission.

1963, No. R-80, directed members of the commission to negotiate with New York members and prepare amendments relative to joint construction of bridge between Plattsburgh and Grand Isle.

ANNOTATIONS

1. Duties of commission. It is believed that the legislature intended that the Vermont members of the Lake Champlain Bridge Commission do no more than negotiate with the New York members of the commission and any other New York authorities to prepare plans for the construction of a new bridge and for a revision of the compact to provide for same. 1962–64 Op. Atty. Gen. 467.

WILLIAM B. PINNEY
DIRECTOR

STATE OF VERMONT
AGENCY OF DEVELOPMENT AND COMMUNITY AFFAIRS
DIVISION FOR HISTORIC PRESERVATION
MONTPELIER, VERMONT 05602
(802) 828-3226

November 2, 1976

TO: Norman James, Assistant to the Governor

FROM: William B. Pinney, Director

DATE: November 2, 1976

SUBJECT: Letter to Mr. & Mrs. Orin Lincoln

We are asking the Governor to sign this letter to be presented to Mr. & Mrs. Lincoln at the annual meeting of the Connecticut River Covered Bridge Association.

They have worked for the preservation of and contributed to the funding of several bridge projects in Vermont, including the Woodstock Bridge.

Could you please send the letter to Richard Roy, 72 Ash Street, Manchester, New Hampshire. He will present it to Mr. & Mrs. Lincoln.

D R A F T

Mr. & Mrs. Orin Lincoln
Congress Street
Greenfield, MA

Dear Mr. & Mrs. Lincoln:

I have been advised by the Vermont Division for Historic Preservation of your dedication to preserving covered bridges in Vermont and the Connecticut River Valley. I would like to take this opportunity to personally thank you for your efforts in saving this valuable part of our country's heritage. It is through the sincere work of people like yourselves that we have such a meaningful and pleasant environment to live in.

Sincerely,

Thomas P. Salmon
Governor

7 Langdon Street

September 14, 1967

Mr. Samuel Pinsly
Room 1102
150 Causeway Street
Boston, Massachusetts

Dear Mr. Pinsly:

It was a pleasant occasion talking with you in the Governor's office several days ago.

I am most encouraged by your willingness to help the State of Vermont in this project to preserve at least one of these historic bridges. For those of us responsible for preservation it is especially heartening. We feel it is our duty to do everything possible to retain such landmarks for the people of the state and for visitors in the future.

Please let me know what we can do to cooperate with you in this joint project.

With kindest regards,

Arthur F. Williams
Chairman of the Board

AFW:rwc

cc. Hon. Arthur Ristau

APPENDIX I. TABULATION OF EXISTING COVERED BRIDGES

This list stresses age and authentic old-time construction. It omits foot bridges, fakes, bridges over dry land and structures that span nothing. A scattering of "modern" bridges on public highways has been included. A few private spans of recent construction may well prove worthy of being added. R.S.A., 1 Jan. 1974

LOCATION	NAME	COUNTY	STREAM	NO. SPANS, LENGTH IN FT	DATE BUILT	BUILDER	TYPE OF CONSTRUCTION	REMARKS
MAINE								
E. of Littleton	Watson settlement	Aroostook	Meduxneweag Stream	2–160	1911		Howe	
South Andover	Lovejoy	Oxford	Ellis River	1– 80	1867		Paddleford	
NW of East Fryeburg	Hemlock	Oxford	Old Saco River	1–116	1857		Paddleford	
S. of Wilsons Mills	Bennett	Oxford	Magalloway River	1–100	1901		Paddleford	
NW of North Bethel	Sunday River	Oxford	Sunday River	1–100	1872	Hiram York	Paddleford	
Porter	Porter-Parsonfield	Oxford-York	Ossipee River	2–160	1858		Paddleford	
Robyville	Robyville	Penobscot	Kenduskeag Stream	1– 76	1876		Howe	Fully Shingled
Bangor	Morse	Penobscot	Kenduskeag Stream	2–212	1884		Howe	Moved & Preserved 1965
E. of Sangerville	Lowe's	Piscataquis	Piscataquis River	1–130	1857		Long	
NEW HAMPSHIRE								
E. of Bartlett		Carroll	Saco River	1–183			Paddleford	Preserved
Conway	Conway	Carroll	Saco River	2–240	1890	Charles & Frank Broughton	Paddleford	Preserved
Redstone–Center Conway	Joel's	Carroll	Saco River	2–293	1846	Peter Paddleford	Paddleford	
Albany		Carroll	Swift River	1–136	1858	Amzi Russell & Leander S. Morton	Paddleford	
Conway		Carroll	Swift River	1–144	1870	Jacob Berry & Jacob Berry, Jr.	Paddleford	
Jackson	Jackson	Carroll	Ellis River	1–138	1876	Charles Broughton	Paddleford	Sidewalk
West Ossipee	Whittier	Carroll	Bear Camp River	1–144		Jacob Berry	Paddleford	
W of North Sandwich	Durgin	Carroll	Cold River	1–110	1869	Jacob Berry	Paddleford	
W of Swanzey	Sawyer's Crossing	Cheshire	Ashuelot River	2–159	1859		Town	
West Swanzey		Cheshire	Ashuelot River	2–159	1832	Zadoc Taft	Town	Sidewalk
Westport	Slate	Cheshire	Ashuelot River	1–122	1862		Town	
S. of Westport	Coombs	Cheshire	Ashuelot River	1–118	1887		Town	
Ashuelot		Cheshire	Ashuelot River	2–160	1864		Town	Sidewalk
E. of Swanzey	Carleton	Cheshire	So. Branch of Ashuelot River	1– 60			Queenpost	
W. of Pittsburg		Coos	Connecticut River	1– 91			Paddleford	Closed
E. of Pittsburg	Happy Corner	Coos	Perry Stream	1– 86			Paddleford	
E. of Pittsburg		Coos	Perry Stream	1– 57			Queenpost	
Stark		Coos	Upper Ammonoosuc River	2–151			Paddleford	Sidewalk

Richard Sanders Allen, Covered Bridges of the Northeast, The Stephen Greene Press, Brattleboro, Vermont, 1974 (rev. ed.)

Location	Name	County	Stream	No. Spans, Length in Ft	Date Built	Builder	Type of Construction	Remarks
Groveton		Coos	Upper Ammonoosuc River	1–136	1852	Charles Richardson & Son	Paddleford	Sidewalk
Lancaster	Mechanic Street	Coos	Israel River	1–108	1862		Paddleford	
Columbia Bridge	Columbia	Coos	Connecticut River	1–148	1912	Charles Babbitt	Howe	
South Lancaster	Mount Orne	Coos	Connecticut River	2–285	1911	Babbitt Bros. & Berlin Construction Co.	Howe	
Bath		Grafton	Ammonoosuc River	4–356	1832		Burr	
Woodsville		Grafton	Ammonoosuc River	2–278	1829		Town	Sidewalk
Swiftwater		Grafton	Wild Ammonoosuc Riv.	1–174	1849		Paddleford	
Haverhill	Bedell's	Grafton	Connecticut River	2–436	1866		Burr	Closed
Flume Reservation	Flume	Grafton	Pemigewasset River	1– 35	1886		Paddleford	
Blair Station	Blair	Grafton	Pemigewasset River	2–273	1869		Long	
W. of Plymouth	Smith	Grafton	Baker River	1–160	1844	Charles Richardson	Long	
E. of Beebe River	Bump	Grafton	Beebe River	1– 66	1877		Queenpost	
N. of Lyme	Edgell	Grafton	Clay Brook	1–154	1885	J.C. & W.G. Piper	Town	
N. of West Campton	Turkey Jim	Grafton	West Branch Brook	1– 60	1874		Queenpost	
Hancock–Greenfield	County	Hillsboro	Contoocook River	1– 88	1937	Hagen-Tibideau Const. Co.	Teco	
Henniker	New England College	Merrimack	Contoocook River	1–130	1972	Milton S. Graton	Town	
West Hopkinton	Rowell's	Merrimack	Contoocook River	1–167	1852		Long	
Bradford	Bement	Merrimack	Warner River	1– 63	1854		Long	
Waterloo		Merrimack	Warner River	1– 76	1857		Town	
Warner	Dalton	Merrimack	Warner River	1– 75			Multiple Kingpost	
W. of Potter Place	Cilleyville	Merrimack	Blackwater River	1– 49	1887		Town	Closed
Andover	Keniston	Merrimack	Blackwater River	1– 71	1882	A.R. Hamilton	Town	
NW of Dover	County Farm	Strafford	Cocheco River	1–112	1879		Howe	
Cornish "City"	Blacksmith Shop	Sullivan	Mill Brook	1– 90	1882	James F. Tasker	Multiple Kingpost	
Cornish "Mills"	Dingleton	Sullivan	Mill Brook	1– 81	1882	James F. Tasker	Multiple Kingpost	
W. of Meriden	Mill	Sullivan	Blood's Brook	1– 80	1880	James F. Tasker	Multiple Kingpost	
S. of Langdon	Prentiss	Sullivan	Great Brook	1– 36	1874	Sanford Granger	Town	Preserved
NE of Alstead		Sullivan	Cold River	1– 78	1869	Sanford Granger	Town	
North Newport	Corbin	Sullivan	Croydon Branch Sugar River	1–105			Town	
Cornish	Windsor	Sullivan	Connecticut River	2–460	1866	James F. Tasker & Bela J. Fletcher	Town	

VERMONT

W. of Salisbury Sta.		Addison	Otter Creek	1–136	1865		Town	
NW of Middlebury	Pulp Mill	Addison	Otter Creek	3–179	c.1820		Burr	Double-Barrel, Orig. 1 span
NE of Middlebury	Halpin	Addison	Muddy Branch of New Haven River	1– 56	1840		Town	41 feet above stream
W. of North Ferrisburg	Spade	Addison	Gully	1– 85	1850	Justin Miller	Town	(moved to site)
East Shoreham		Addison	Lemon Fair River	1–108	1897	Rutland RR	Howe	Ex-railroad Bridge
NW of Bennington	Silk	Bennington	Walloomsac River	1– 88	1840		Town	
NW of Bennington	Papermill Village	Bennington	Walloomsac River	1–125	1889	Charles F. Sears	Town	
S. of North Bennington	Henry	Bennington	Walloomsac River	1–121	1840		Town	
W. of West Arlington	Arlington Green	Bennington	Batten Kill	1– 66	1852		Town	
N. of East Arlington	Chiselville	Bennington	Roaring Branch of Batten Kill	1–117	1870	Daniel Oatman	Town	
W. of Lyndon	Chamberlain	Caledonia	So. Wheelock Branch of Passumpsic River	1– 66			Queenpost	Closed
Lyndon	Schoolhouse	Caledonia	So. Wheelock Branch of Passumpsic River	1– 42	1872		Queenpost	
N. of Lyndon Center	Bradley	Caledonia	Miller Run	1– 56			Queenpost	
NE of Lyndonville	Lang	Caledonia	East Branch of Passumpsic River	1– 57			Queenpost	
South Danville	Greenbank Hollow	Caledonia	Joes Brook	1– 50	1886		Queenpost	
S. of Prindle Corner		Chittenden	Lewis Creek	1– 58			Burr	
S. of East Charlotte	Quinlan	Chittenden	Lewis Creek	1– 87	1849		Burr	
NW of Charlotte		Chittenden	Home Creek	1– 39			Laminated Arch	
Westford		Chittenden	Browns River	1– 97			Burr	Closed
Shelburne		Chittenden	Burr Pond	1–168	1845	Farewell Wetherby	Burr	Double-Barrel (moved here 1951; Blt. orig. at Cambridge over Lamoille River)
Montgomery	Comstock	Franklin	Trout River	1– 80	1883	Jewett Bros.	Town	
NW of Montgomery	Harnois	Franklin	Trout River	1– 89	1863	Jewett Bros.	Town	
NW of Montgomery	Hopkins	Franklin	Trout River	1– 80	1875	Jewett Bros.	Town	
Montgomery	Fuller	Franklin	Black Falls Brook	1– 55	1890	Jewett Bros.	Town	
S. of Montgomery Ctr.	Hectorville	Franklin	S. Branch, Trout River	1– 54	1883	Jewett Bros.	Town	
S. of Montgomery Ctr.	Hutchins	Franklin	S. Branch, Trout River	1– 54	1883	Jewett Bros.	Town	
SW of Montgomery	West Hill	Franklin	West Hill Brook	1– 40	1883	Jewett Bros.	Town	Closed (Private)
Fairfax		Franklin	Mill Brook	1– 57			Town	
East Fairfield		Franklin	Black Creek	1– 68	1865		Queenpost	
E. of Belvidere	Morgan	Lamoille	N. Br. of Lamoille River	1– 65	1895	Lewis Robinson	Queenpost	
N. of Belvidere	Lumber Mill	Lamoille	N. Br. of Lamoille River	1– 72	1895	Lewis Robinson	Queenpost	
N. of Waterville		Lamoille	N. Br. of Lamoille River	1– 62	1895		Queenpost	
N. of Waterville		Lamoille	N. Br. of Lamoille River	1– 65			Queenpost	
Waterville		Lamoille	N. Br. of Lamoille River	1– 72			Queenpost	
East Johnson		Lamoille	Gihon River	1– 60			Queenpost	
Johnson	Power Plant	Lamoille	Gihon River	1– 65			Queenpost	
SE of Johnson	Waterman	Lamoille	Waterman Brook	1– 70			Queenpost	
Cambridge Junction	Poland	Lamoille	Lamoille River	1–153	1887	George W. Holmes	Burr	
S. of Jeffersonville	Scott	Lamoille	Brewster River	1– 80			Burr	
Cambridge	Little Cambridge	Lamoille	Seymour River	1– 60	1897	George W. Holmes	Burr	Moved here 1950 (Private)

Location	Name	County	Stream	No. Spans, Length in Ft	Date Built	Builder	Type of Construction	Remarks
E. of Sterling	Sterling	Lamoille	Sterling Brook	1– 66			Queenpost	
SE of Stowe	Stowe Hollow	Lamoille	Gold Brook	1– 49			Howe	
Thetford Center		Orange	Ompompanoosuc River	1– 80			Haupt	With Auxiliary Arch
Union Village		Orange	Ompompanoosuc River	1–100	1867		Multiple Kingpost	
S. of Chelsea	Moxsley	Orange	First Br. of White River	1– 55	1887	Arthur Adams	Queenpost	
N. of North Tunbridge	Flint	Orange	First Br. of White River	1– 50	1845		Multiple Kingpost	
N. of North Tunbridge	Bates	Orange	First Br. of White River	1– 55	1902		Multiple Kingpost	
Tunbridge	Hayward & Noble	Orange	First Br. of White River	1– 60	1883		Multiple Kingpost	
S. of Tunbridge	Cilley	Orange	First Br. of White River	1– 65	1883		Multiple Kingpost	
N. of South Tunbridge	Howe	Orange	First Br. of White River	1– 60	1879		Multiple Kingpost	
S. of East Randolph		Orange	Second Branch of White River	1– 45	1904		Multiple Kingpost	Half-size Truss
S. of East Randolph		Orange	Second Branch of White River	1– 50	1904		Multiple Kingpost	Half-size Truss
N. of East Bethel		Orange	Second Branch of White River	1– 50	1904		Multiple Kingpost	
SW of Coventry		Orleans	Black River	1– 87	1881	John D. Colton	Paddleford	
S. of Irasburg		Orleans	Lord Creek	1– 50	1881	John D. Colton	Paddleford	Private
S. of North Troy	Upper	Orleans	Missisquoi River	1– 91			Town	With single pins
N. of Proctor	Gorham	Rutland	Otter Creek	1–114	1841	Abraham Owen & N.M. Powers	Town	
							Town	
Pittsford Station	Depot	Rutland	Otter Creek	1–121			Town	
Florence Station	Hammond	Rutland	Otter Creek	1–139	1842	Asa Nourse	Town	Preserved
S. of Brandon	Dean	Rutland	Otter Creek	1–136	1865		Town	
SW of Brandon	Sanderson	Rutland	Otter Creek	1–132			Town	
East Clarendon	Kingsley	Rutland	Mill River	1–120	1870	T.K. Horton	Town	
E. of North Clarendon	Brown	Rutland	Cold River	1–100	1880	Nicholas M. Powers	Town	
S. of Pittsford	Cooley	Rutland	Furnace Brook	1– 60	1849	Nicholas M. Powers	Town	80 foot Ridgepole
Warren		Washington	Mad River	1– 37	1880	Walter Bagley	Queenpost	
Waitsfield	Old Arch	Washington	Mad River	1–120	1833		Burr	Sidewalk
N. of Waitsfield Common		Washington	Pine Brook	1– 40	1872		Kingpost	
S. of Northfield Falls	Slaughter House	Washington	Dog River	1– 55			Queenpost	
Northfield Falls		Washington	Dog River	1–100	1872		Town	
W. of Northfield Falls		Washington	Cox Brook	1– 45			Queenpost	
W. of Northfield Falls		Washington	Cox Brook	1– 54			Queenpost	
SW of Northfield		Washington	Rocky Brook	1– 39	1899		Kingpost	
E. of Plainfield	Orton Farm	Washington	Winooski River	1– 50	1890	Herman F. Townsend	Queenpost	Private
W. of Plainfield	Coburn	Washington	Winooski River	1– 50	1851		Queenpost	
Green River		Windham	Green River	1–104	1870		Town	
Townshend State Forest	Scott	Windham	West River	3–276	1870	Harrison Chamberlain	Town	Plus: 2 spans Kingpost
N. of West Dummerston		Windham	West River	2–280	1872	Caleb B. Lamson	Town	
W. of Williamsville		Windham	Marlboro Branch	1–120	1870		Town	

W. of Brattleboro	Creamery	Windham	Whetstone Brook	1– 80	1879	A.H. Wright	Town	Sidewalk
E. of Saxtons River	Hall	Windham	Saxtons River	1– 89	1870		Queenpost	
Grafton	Kidder	Windham	S. Branch of Saxtons River	1– 67	1870		Queenpost	
Bartonsville		Windham	Williams River	1–151	1870	Sanford Granger	Town	
S. of Bartonsville		Windham	Williams River	1– 87	1868	Sanford Granger	Town	
W. of Rockingham	Victorian Village	Windham	Br. of Williams River	1– 42	1872	Harrison Chamberlain	Queenpost	Moved here 1967; Orig. at West Townshend
W. of Amsden	Upper Falls	Windsor	Black River	1–121			Town	
North Springfield	Baltimore	Windsor	Br. of Great Brook	1– 42	1870	Granville Leland	Town	Moved to site 1970
W. of Brownsville	Best's	Windsor	Mill Brook	1– 36			Laminated Arch	
W. of Brownsville		Windsor	Mill Brook	1– 44			Laminated Arch	
W. of West Woodstock	Lincoln	Windsor	Ottauquechee River	1–134	1877	R.W. & B.H. Pinney	Pratt	Adaption with Arch
Woodstock	Middle	Windsor	Ottauquechee River	1–125	1969	Milton S. Graton	Town	
Taftsville		Windsor	Ottauquechee River	2–189	1836	Solomon Emmons	Queenpost-Arch	
North Hartland	Willard	Windsor	Ottauquechee River	1–123			Town	
E. of Hartland	Martin's Mill	Windsor	Lull's Brook	1–119	1881	James F. Tasker	Town	
MASSACHUSETTS								
Sheffield	Upper	Berkshire	Housatonic River	1– 93	1835		Town	
Sheffield		Berkshire	Housatonic River	1–135	1953		Teco	
Gilbertville		Hampshire-Worcester	Ware River	1–135	1886		Town	
Conway	Burkeville	Franklin	South River	1–107	1873		Multiple Kingpost	Iron Rod Verticals
N. of Greenfield	Pumping Station	Franklin	Green River	1– 94	1972		Teco	Replacement of 1870 Br.
S. of Lyonsville	Arthur Smith	Franklin	North River	1–112	1870		Burr	Re-erected here 1896
N. of Charlemont	Bissell	Franklin	Mill Brook	1– 92	1951		Teco	
East Pepperell		Middlesex	Nashua River	1– 76	1963		Teco	
Old Sturbridge Village		Worcester	Arm of Quinebaug Riv.	1– 65	1870		Town	Orig. "Taft" Bridge in Dummerston, Vt.; to Sturbridge 1952; moved to present site 1956
CONNECTICUT								
West Cornwall		Litchfield	Housatonic River	2–242	1841		Town	
Bulls Bridge		Litchfield	Housatonic River	1–109	1842		Town	
Colchester–Easthampton	Comstock's	Middlesex–New London	Salmon River	1– 80	1873		Howe	Truss Variation
NEW YORK								
Downsville		Delaware	E. Br. Delaware River	1–174	1854	Robert Murray	Long	

Location	Name	County	Stream	No. Spans, Length in Ft	Date Built	Builder	Type of Construction	Remarks
East Delhi	Fitch's	Delaware	W. Br. Delaware River	1–100	1885	David L. Wright	Town	Orig. blt. in Delhi in 1870 by James Frazier & James Warren
Hamden		Delaware	W. Br. Delaware River	2–128	1859	Robert Murray	Long	
SW of Margaretville	Tuscarora Club	Delaware	Mill Brook	1– 24	1870		Kingpost	Orig. blt. at Dunraven; moved here 1935 (Private)
S. of Cook's Falls	Methol	Delaware	Trout Brook	1– 24	1877	Anson Jenkins & Augustus Neidig	Town	44 ft. span cut to 24 ft.; moved here 1954
Jay		Essex	E. Br. Ausable River	4–150	1857		Howe	Originally single-span
Salisbury Center		Herkimer	Spruce Creek	1– 49	1875	Alvah Hopson	Burr	
S. of East Springfield	Hyde Hall	Otsego	Shadow Brook	1– 40	1830		Burr	In Gummerglass State Park
Buskirk		Rensselaer–Washington	Hoosic River	1–165	1880		Howe	
Edinburg		Saratoga	Beecher Creek	1– 29	1879	Arad Copeland	Queenpost	Private
North Blenheim	Blenheim	Schoharie	Schoharie Creek	1–210	1855	Nicholas M. Powers	Long	Double-barrel, unique center arch
Hall	Hall's Mills	Sullivan	Neversink River	1–119	1912	David Benton & John Knight	Town	Closed
Beaver Kill	Camp Site	Sullivan	Beaver Kill	1– 98	1865	John Davidson	Town	
W. of Willowemoc	Bendo	Sullivan	Willowemoc Creek	1– 43	1860	John Davidson	Town	Cut in half & moved here 1913
W. of Livingston Manor	Van Tran Flat	Sullivan	Willowemoc Creek	1– 98	1860	John Davidson	Town	
Newfield		Tompkins	W. Br. Cayuga Inlet	1– 80	1853	Samuel Ham & Sons	Town	
Rifton	Perrine's	Ulster	Wall Kill	1–138	1844		Burr	
S. of Seager		Ulster	Dry Brook	1– 32	1907	Jerome Moot	Kingpost	
S. of Seager		Ulster	Dry Brook	1– 42	1907	Jerome Moot	Kingpost	
N. of Seager	Forge	Ulster	Dry Brook	1– 27	1907	Jerome Moot	Kingpost	
SW of Margaretville	Grants Mills	Ulster	Mill Brook	1– 66	1902	Edgar Marks & Wesley Alton	Town	Closed
E. of Olive Bridge		Ulster	Old Channel Esopus Creek	1– 60		Frank Mead	Town	Orig. at Turnwood; moved here 1930 (Private)
East Salem	Eagleville	Washington	Batten Kill	1– 88	1858		Town	
Shushan		Washington	Batten Kill	2–160	1858	Stevens Bros.	Town	Preserved on concrete pedestal
S. of Salem	Rexleigh	Washington	Batten Kill	1–100	1874		Howe	
NEW JERSEY								
W. of Sergeantsville		Hunter Don	Wickecheoke Creek	1– 84	1866		Queenpost	

RAILROAD BRIDGES

Location	Railroad		Stream	No. Spans, Length in Ft	Date Built		Type	Remarks
Hillsboro, N.H.	Boston & Maine		Contoocook River	2–219	1903		Town-Pratt	Sidewalk
Goffstown, N.H.	Boston & Maine		Piscataquog River	1–117	1900		Town-Pratt	Added laminated arch
Contoocook, N.H.	Claremont & Concord		Contoocook River	1–157	1889		Town-Pratt	Unused
E. of Chandler, N.H.	Claremont & Concord		Sugar River	2–228	1906		Town-Pratt	
W. of Chandler, N.H.	Claremont & Concord		Sugar River	1–122	1905		Town-Pratt	Added laminated arch
Lincoln, N.H.	Clark's Trading Post		Pemigewasset River	1–100	1904		Howe	Orig. east of Montpelier, Vt.; Moved here 1964
E. of Wolcott, Vt.	St. Johnsbury & Lamoille County		Lamoille River	1– 90	1908		Town-Pratt	
Swanton, Vt.	St. Johnsbury & Lamoille County		Missisquoi River	3–369	1898		Town-Pratt	Unused

OFFICE OF THE
COMMISSIONER

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
MONTPELIER
05602

August 21, 1973

Mr. Joseph Cohen, Editor
Covered Bridge Topics
130 Westfield Drive
Holliston, Massachusetts 01746

Dear Mr. Cohen:

Your letter of inquiry of August 10 has been referred to me for reply.

Two covered bridges were involved in the storm damage of late June. Both structures experienced severe abutment scour and are now closed to traffic.

These bridges are:

1. Nadeau's Bridge in Lyndon Corners, Town Highway No. 58 - Bridge No. 35.

2. Mill Brook Bridge in West Windsor, Town Highway No. 37 - Bridge No. 34.

Fortunately the superstructure damage to either bridge was minimal, and they both should be back in service in the very near future.

Somewhat prior to our storm period, Bridge No. 4 on Vermont Route 122 in Lyndon Center was damaged by a truck exceeding the posted clearance, which removed all of the struts. This has necessitated the reduction of loading capacity from 20,000 pounds to 8,000 pounds for which it is now posted.

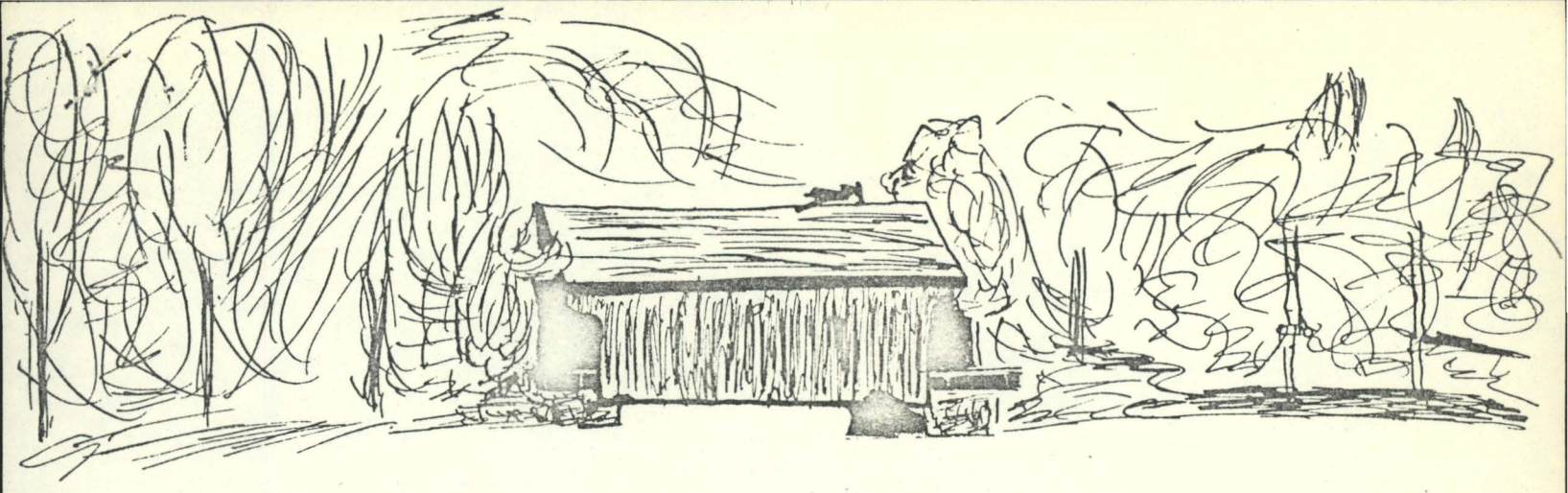
I will be pleased to keep you informed of any future changes in our covered bridges, and please do not hesitate to call or write this office if you mquire further information.

Sincerely,

Russell H. Watson

Russell H. Watson
Acting Maintenance Engineer

RHW:vb
cc: Agency of Development & Community Affairs Historic Sites
E. H. Stickney
R. O. Munn
F. C. Scribner



August 10, 1973

RHW

COVERED BRIDGE TOPICS

Gentlemen:

I have recently taken over the editorship of Covered Bridge Topics. This is a publication, with almost 1,000 subscribers, of the National Society for the Preservation of Covered Bridges.

I would appreciate information on the status of Vermont covered bridges that might have been damaged in the recent floods.

I would also appreciate your letting me know of any changes in the future, of any of your covered bridges.

Sincerely,

Joseph Cohen

Joseph Cohen, Editor
130 Westfield Drive
Holliston, Mass. 01746

Oscar F. Lane, Business Manager
11 Cannon Hill Rd. Ext.
Groveland, Mass. 01834

Editorial Office
130 Westfield Drive
Holliston, Mass. 01746

VERMONT COVERED BRIDGES

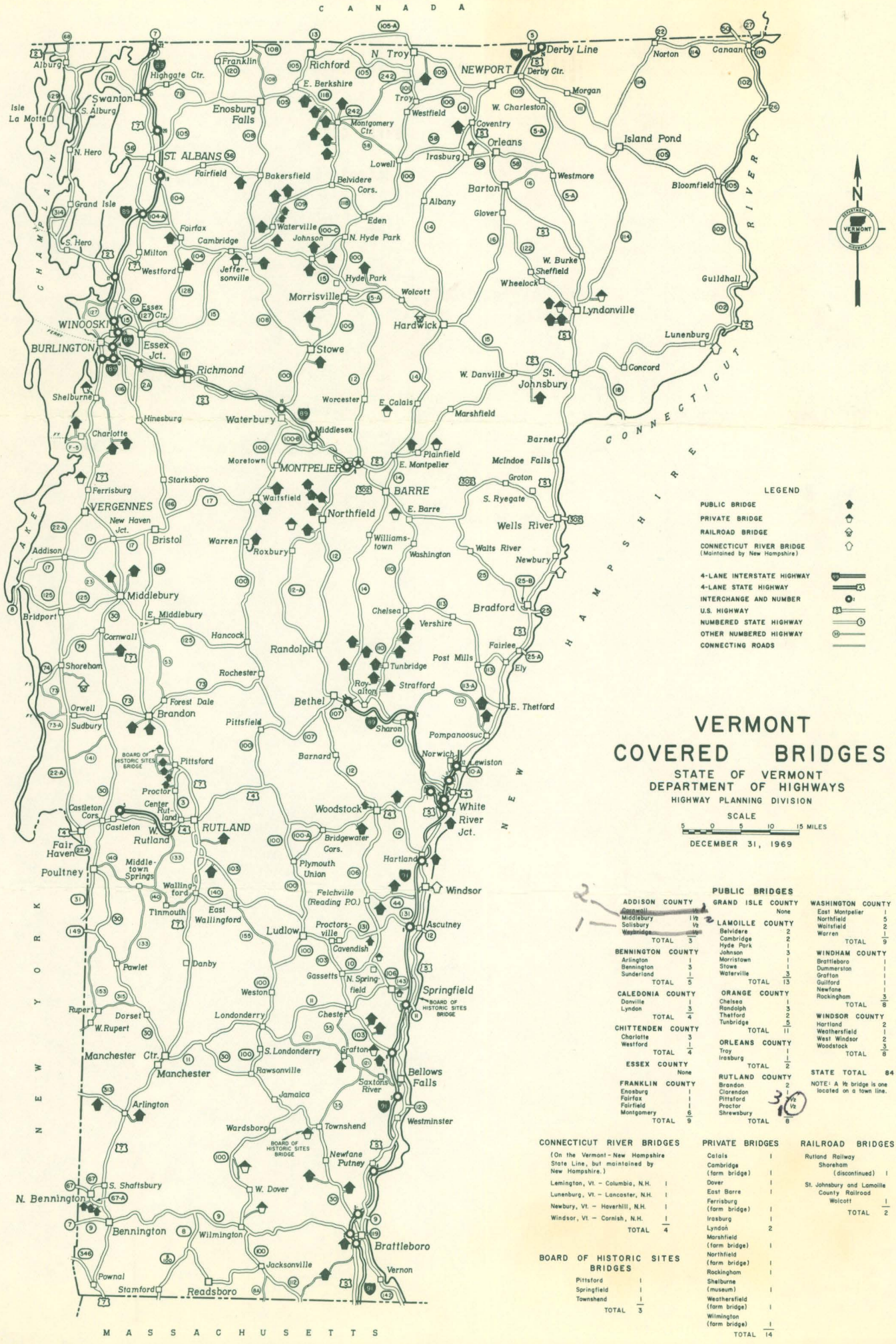
Town	Number of Bridges	Map Location
Addison County:		
Middlebury	2	D-9
Salisbury	1	D-10
Bennington County:		
Arlington	1	D-15
Bennington	3	C-17
Sunderland	1	D-15
Caledonia County:		
Danville	1	I-6
Lyndon	3	I-5
Chittenden County:		
Charlotte	3	C-7, D-7
Westford	1	E-5
Franklin County:		
Enosburg	1	E-3
Fairfax	1	E-5
Fairfield	1	E-4
Montgomery	6	F-3
Lamoille County:		
Belvidere	2	F-4
Cambridge	2	E-5
Hyde Park	1	F-5
Johnson	3	F-5
Morristown	1	F-5
Stowe	1	F-6
Waterville	3	F-4
Orange County:		
Chelsea	1	G-9
Randolph	3	F-10
Thetford	2	H-10
Tunbridge	5	G-10

VERMONT COVERED BRIDGES

Town	Number of Bridges	Map Location
Orleans County:		
Troy	1	H-2
Irasburg	1	H-4
Rutland County:		
Brandon	2	D-11
Clarendon	1	E-12
Pittsford	3	D-11
Proctor	1	D-11
Shrewsbury	1	E-13
Washington County:		
East Montpelier	1	G-7
Northfield	5	F-8
Waitsfield	2	E-8
Warren	1	E-8
Windham County:		
Brattleboro	1	G-17
Dummerston	1	G-16
Grafton	1	F-15
Guilford	1	G-17
Newfane	1	F-16
Rockingham	3	G-15
Windsor County:		
Hartland	2	G-12
Weathersfield	1	G-13
West Windsor	2	G-13
Woodstock	3	G-12
BOARD OF HISTORIC SITES BRIDGES:		
Pittsford	1	D-11
Springfield	1	G-14
Townshend	1	F-16

VERMONT COVERED BRIDGES

Town	Number of Bridges	Map Location
Connecticut River Bridges:		
Lemington, Vt. - Columbia, N.H.	1	L-3
Lunenburg, Vt. - Lancaster, N.H.	1	K-6
Newbury, Vt. - Haverhill, N.H.	1	I-9
Windsor, Vt. - Cornish, N.H.	1	G-13
Railroad Bridges:		
Rutland Railway		
Shoreham (discontinued)	1	C-10
St. Johnsbury & Lamoille County Railroad		
Wolcott	1	G-5



VERMONT COVERED BRIDGES

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
HIGHWAY PLANNING DIVISION

SCALE
5 0 5 10 15 MILES

DECEMBER 31, 1969

PUBLIC BRIDGES

ADDISON COUNTY	
Cornwall	½
Middlebury	1½
Salisbury	½
Weybridge	½
TOTAL	3

BENNINGTON COUNTY	
Arlington	1
Bennington	3
Sunderland	1
TOTAL	5

CALEDONIA COUNTY	
Danville	1
Lyndon	3
TOTAL	4

CHITTENDEN COUNTY	
Charlotte	3
Westford	1
TOTAL	4

ESSEX COUNTY
None

FRANKLIN COUNTY	
Enosburg	1
Fairfax	1
Fairfield	1
Montgomery	6
TOTAL	9

GRAND ISLE COUNTY
None

LAMOILLE COUNTY	
Belvidere	2
Cambridge	2
Hyde Park	1
Johnson	3
Morristown	1
Stowe	1
Waterville	3
TOTAL	13

ORANGE COUNTY	
Chelsea	1
Randolph	3
Thetford	2
Tunbridge	5
TOTAL	11

ORLEANS COUNTY	
Troy	1
Irasburg	1
TOTAL	2

RUTLAND COUNTY	
Brandon	2
Clarendon	1
Pittsford	3½
Proctor	½
Shrewsbury	1½
TOTAL	8

WASHINGTON COUNTY	
East Montpelier	1
Northfield	5
Waitsfield	2
Warren	1
TOTAL	9

WINDHAM COUNTY	
Brattleboro	1
Dummerston	1
Grafton	1
Guilford	1
Newfane	1
Rockingham	3
TOTAL	8

WINDSOR COUNTY	
Hartland	2
Weathersfield	1
West Windsor	2
Woodstock	3
TOTAL	8

STATE TOTAL 84

NOTE: A ½ bridge is one located on a town line.

CONNECTICUT RIVER BRIDGES

(On the Vermont - New Hampshire State Line, but maintained by New Hampshire.)

Lemington, Vt. – Columbia, N.H.	1
Lunenburg, Vt. – Lancaster, N.H.	1
Newbury, Vt. – Haverhill, N.H.	1
Windsor, Vt. – Cornish, N.H.	1
TOTAL	4

BOARD OF HISTORIC SITES BRIDGES

Pittsford	1
Springfield	1
Townshend	1
TOTAL	3

PRIVATE BRIDGES

Calais	1
Cambridge (farm bridge)	1
Dover	1
East Barre	1
Ferrisburg (farm bridge)	1
Irasburg	1
Lyndon	2
Marshfield (farm bridge)	1
Northfield (farm bridge)	1
Rockingham	1
Shelburne (museum)	1
Weathersfield (farm bridge)	1
Wilmington (farm bridge)	1
TOTAL	14

RAILROAD BRIDGES

Rutland Railway	
Shoreham (discontinued)	1
St. Johnsbury and Lamoille County Railroad	
Wolcott	1
TOTAL	2

Free Press 10/11/69

Covered Bridges Are Priceless Vermont Heritage

No one seems to know the origin of the covered bridge in Vermont, but it is generally conceded that Vermonters adapted to their own use similar structures in Switzerland and England.

The covered bridges early became as much a part of Vermont's landscape as birch trees. Closed to the weather for longevity, spanning the many streams of the hill country, they have made travel from farm to farm and town to town possible. Most of these bridges took from two to five years in the building as the lumber was all handcut and dragged down from the mountain sides by oxen and horses.

Today, Vermont, with hundreds of small and large streams is the covered bridge leader among the New England states with 84 on public highways, fourteen on private roads and two railroad bridges. The oldest covered bridge in the state is the twin-lane structure known as the Pulpmill Bridge which crosses Otter Creek between Middlebury and Weybridge.

The only other double-land bridge left in Vermont is at the Shelburne Museum, moved from its original site at Cambridge. The youngest member of the family is the Moseley Bridge, over Rocky Brook which went up in 1899. However, a new structure is currently being built in Woodstock. Vermont's highest covered structure above its spanned stream is the soaring Halpin Bridge across Muddy Branch in Middlebury. Now on a little used road, it once served a marble mill.

The Vermont covered bridge has witnessed tragedy, but much more it has seen romance. It provided a secluded trysting place in the horse and buggy days and possibly serves the same purpose in these modern motor times.

Many a speckled trout has been snared by a barefoot boy from its friendly shelter, and to those who might remember, there are fond recollections of clumping horses' hooves and the slow clatter of old-fashioned cart and carriage wheels on its sturdy floor planks. Surely no modern structure can duplicate its homely, friendly charm.

As for scenic covered bridge locations, Vermont has dozens of them, but much to be recommended are the West Hill Bridge over West Hill Brook in a colorful Montgomery setting, the Levis Bridge crossing the same stream as one comes into the village, the Hectorville Bridge over the South Branch of Montgomery's Trout River, the Safford Bridge crossing tumbling Seymour River in the Pleasant Valley section of Cambridge with Mt. Mansfield in the background, the Stowe Hollow Bridge on Gold Brook in the Town of Stowe, the Garfield Bridge high up on Green River in Nrth Hyde Park, the Lewis Creek bridges in Charlotte, the structures in the lovely old town of Newfane, the Mill Brook bridges on Mill Brook in Windsor, the West Arlington Bridge on the Battenkill River, the Green River Bridge in the far south village of Guilford, the Guildhall-Lancaster Bridge across the Connecticut River and the Mount Orne Bridge over the same broad stream between Lunenburg and Lancaster.

To the admirer of these romantic and interesting structures, Vermont offers the ideal hunting ground. Here he can find bridges across wild, tumbling mountain brooks, broad rivers and placid streams in surroundings of gorgeous Green Mountain peaks, charming country villages, lush green meadows and characteristic farms. The map on page 9 gives the approximate location of every remaining bridge so there is little trouble in finding them today. — Vermont Development Department.

May 26, 1969

Mr. Lloyd A. Machum
Westmorland Historical Society
Box 1187
Sackville, New Brunswick
Canada

Dear Mr. Machum:

I am writing in reply to your letter regarding the policy of the State of Vermont on the preservation of covered bridges. In general the policy is to preserve all highway covered bridges. I am enclosing a copy of our state statute pertaining to covered bridges. While the law does not forbid the destruction of a bridge it does ensure that a bridge cannot be removed without notice to the governor and to this Board. This is generally sufficient to ensure that a bridge be saved if at all practical. Railroad covered bridges are privately owned and do not come under the law. There are now 3 left in the state and steps have been taken to ensure that all 3 will be preserved as state historic sites.

Sincerely yours,

William B. Pinney
Director

WBP:ct

Enc.

Westmorland Historical Society
New Brunswick, Canada

Box 1187 Sackville
May 12,1969

To His Honor
The Governor of
Vermont
Montpelier , Vt.

Would you be so kind as to direct my letter to the appropriate department of your government in order that I may find out if Vermont has a policy on the preservation of covered bridges. I would like to receive complete information on the policy if there is one and progress to date.

Yours respectfully,

L A Machum

Lloyd A. Machum

April 28, 1969

Robert S. Becker
Office of the County Executive
County Office Building
Syracuse, N.Y. 13202

Dear Mr. Becker:

My friend Mr. Gibb has forwarded to me your letter expressing concern over the removal of covered bridges.

Fortunately about 7 years ago the Governor of the State issued an executive order which is now law requiring the town selectmen to notify the Governor's office and the Board of Historic Sites on the pending removal of any public covered bridge in the State. The bridge can only be memoved with permission of our Board. In some instances we have been able to find funds to restore bridges or ensure that they are moved to an appropriate site. In some cases we have allowed the bridges to come down if they were in very poor repair or not of particular historic significance. I think this law has worked well though like you I would like to see every bridge saved.

If you so wish we can send a copy of our covered bridge legislation to Historic Site offices in New York and in New Hampshire.

Thank you for your interest in this very important matter.

Sincerely yours,

Afthur F. Williams
Chairman

AFW:ct

7 Langdon Street

April 23, 1968

Hon. Philip H. Hoff
Governor of the State of Vermont
Montpelier, Vermont

Dear Phil:

I received the enclosed document from your office fairly recently and have given it some thought. I feel that a Covered Bridge Week proclaimed by the Governor of Vermont would be worth while for the following reasons:

1. It would draw the attention of people in communities to their covered bridges, their state of repair, and their intrinsic value to the community and the state.

2. It would be a tourist attraction that might be worked in with a state covered bridge tour in the future.

3. It is my feeling (and you know from the Wolcott bridge experience) that every single covered bridge in the state should remain standing.

Even though we have many other attractions, I feel that our covered bridges are the most natural historic sites and fit in perfectly with our topography, adding a great deal to the total historic scene of our state.

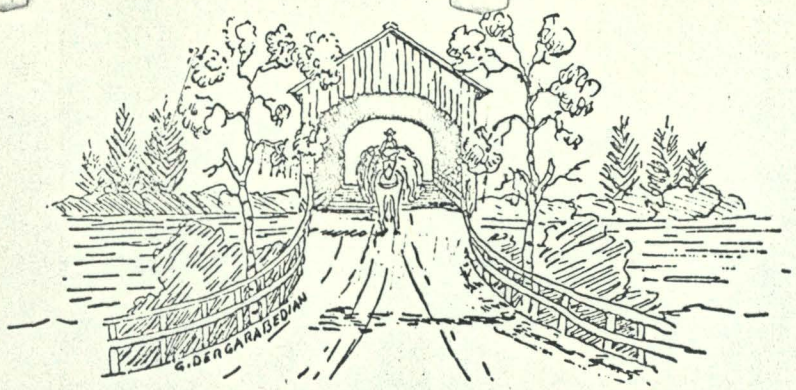
If you would like our office to draw up a proclamation, perhaps going into the number of covered bridges left, etc., we would be most happy to oblige.

Once more, I would like to thank you for your avid interest in historic sites and all you have done to bring our program to this stage of progress.

Sincerely yours,

Arthur F. Williams
Chairman of the Board

AFW:rwc
Enclosure: One



National Society
for the
Preservation of
Covered Bridges
INCORPORATED

HEADQUARTERS AT
BOSTON, MASSACHUSETTS

February 29 1968

The Honorable Philip H. Hoff
Governor
Montpelier, Vermont

Dear Governor Hoff,

As you know we have for years been active in trying to preserve Covered Bridges, most recently in trying to preserve the railroad bridge in Lamoille County, Vermont and in the building of the new Covered Bridge in Woodstock.
Now we plan to hold a Covered Bridge Festival In Rutland on August 16, 17, 18th and then plan to take part in the dedication of the new bridge in Woodstock on August 18th.
We think it would be advantageous to your State of Vermont and to our aims to preserve Covered Bridges for posterity if a Covered Bridge Week could be proclaimed for the week of August 12th.
Would you kindly give this your consideration.

Sincerely yours,

Herbert K. Richardson

Herbert K. Richardson President
National Society for the Preservation
of Covered Bridges.
39 Long Hill Road
Ashland Massachusetts 01721

7 Langdon Street

September 26, 1967

Mrs. Harold Leary
37 Rochelle Street
Rochester, New York

Dear Mrs. Leary:

We have your note of recent date requesting our Guide to Historic Sites and some guidance in the area of covered bridges.

Under separate cover we are sending you our Official Guide to Historic Sites which has just come off the press. We hope it will be helpful.

Enclosed with this letter you will find a map of Vermont Covered Bridges, as of July 1, 1963. Not all of these still exist, but a great number are still with us, and we hope you can make some use of the map.

Our Chairman points out that you may want to purchase a paperback book which has just come out. It is called The Covered Bridge and contains 100 photographs of Vermont Covered Bridges. The author is Herbert Wheaton Congdon; the publisher, Vermont Books, Middlebury, Vermont. The cost is $2.95, and the (black and white) photos are excellent. A color photo decorates the front cover.

We hope you will have a satisfying experience in the realm of Vermont Historic Sites and that of covered bridges.

Sincerely,

Ruth W. Camp

rwc

Please s end me a complete guide to Vermont's Historic places and especially covered bridges. Thank you.

Mrs. Harold Leary
37 Rochelle St.
Rochester, N. Y. 14612

McGILL UNIVERSITY
MONTREAL

GEOGRAPHY SUMMER SCHOOL

Stanstead College,
Stanstead, Quebec.
August 1st, 1967.

Mr. Richard G. Titus,
Supervisor of Historic Sites,
State of Vermont,
Board of Historic Sites,
7 Langdon Street,
Montpelier, Vermont.

Dear Mr. Titus,

I wish to acknowledge your helpful letter of July 18th in reply to my enquiry about round barns and covered bridges in Vermont. The article in the Rural Vermonter which you mentioned to me, I have had for some time, but the book is a new item and I am most grateful to you for drawing my attention to it. I trust it will be possible for me to follow up this interest and perhaps, as I suggested, to have one of my students work on this topic, as an example of cultural difusion, sometime in the future.

Thank you again for your kind co-operation,

Yours sincerely,

Frank C. Innes,
Assistant Professor of
Geography.

FCI/scf

7 Langdon Street

July 18, 1967

Prof. Frank Innes, McGill University
c/o Geography Summer School
Stanstead College
Stanstead, Quebec

Dear Professor Innes:

Your inquiry, made last month while you were in Montpelier, has been awaiting the time necessary for us to inquire about round barns and covered bridges.

Mr. David Warden, who is curator of the Museum of the Vermont Historical Society, informs us that your best source of information about covered bridges in this region is a book published by the Stephen Greene Press, Brattleboro, Vermont. Writer, Richard Allen; title, Covered Bridges of the Northeast. This may be purchased from the Vermont Historical Society in Montpelier or possibly at a bookstore in Montreal. Its cost is $6.50. Mr. Warden says that it has a good text and a chart of every covered bridge in the northeastern United States.

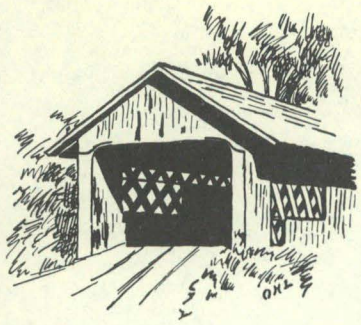
Mr. Warden found an article by Milo H. Reynolds: Two Dozen Round Barns, in the Spring, 1963 issue of Rural Vermonter, pages 35-37. According to a map of round barns appearing on the back cover of that issue of Rural Vermonter, all the round barns were built between 1899 and 1917.

We hope that the above information will prove helpful. Thank you for your interest.

Sincerely,

Richard G. Titus
Supervisor of Historic Sites

RGT:rwc



Connecticut River Valley Covered Bridge Society

163 Davis Street
Greenfield, Massachusetts 01301

Shelburne, Mass.
Feb. 25, 1967

State of Vermont
Board of Historic Sites
Montpelier

Dear Mr. Titus

I have your letter of February 23, 1967 about information for Covered Bridges in the Connecticut Valley in Vermont, also those spanning the river between Vermont and New Hampshire.

I have returned your letter to the President of our Society, Mrs. Orrin H. Lincoln at the above address (Greenfield address) as I feel she may be better qualified to impart the information, which you desire.

Yours truly
Alberta Dwyer
Treas. Conn. River Valley
Covered Bridge Society.

Mrs. Max G. Dwyer
R.D. 1 Box 43
Shelburne Falls
Massachusetts 01370

7 Langdon Street

February 23, 1967

Mrs. Max J. Dwyer
Connecticut River Valley Covered Bridge Society
R. F. D. #1, Box 43
Shelburne Falls, Massachusetts

Dear Mrs. Dwyer:

We would very much like to have all possible information on covered bridges in the valley of the Connecticut River which are located in Vermont. We are also very much interested in the remaining covered bridges which span the Connecticut River between Vermont and New Hampshire.

We will be most grateful for any information you can furnish.

Yours appreciatively,

Richard G. Titus
Supervisor of Historic Sites

RGT:rwc

STOWE REPORTER
OCTOBER 15, 1965

COVERED BRIDGES IN THE STATE OF VERMONT

One of the Autumn attractions in Lamoille County to tourists and others are the covered bridges. There are thirteen covered bridges in the county, over 75 in the state of Vermont. In this county there are two in Stowe, three in Johnson, two in Cambridge, three in Waterville, two in Belvidere, and one in Hyde Park.

It is lucky for the old bridges that a number of people who are really interested want to see the charm in the old work preserved. Such is the case in the town of Hyde Park.

William Patch, road commissioner for the town of Hyde Park, is supervisor over a group of men who are working on a new road to by-pass the Garfield Bridge over Green River. The bridge will remain as a landmark and a tangible reminder of our forefathers. It is the only one left in the town. No one knows exactly how old the bridge is, but it probably was built in the late 1800's. Preserving the bridge will enable persons to walk through it and observe its beauty, but cars will not be able to pass over it.

The bridge itself shows years of wear, with boards missing here and there, but for tourists and others it holds many tales. It is located in a landscape of beautiful trees, mountains and rocks and its plainness emphasizes its beauty among them. In winter its grey bulk shows up against the whiteness of the snow and branches iced with frost and the icy water bring out a different beauty.

Various names have been applied to covered bridges, but the most popular were "Kissing Bridge" and "Wishing Bridge". The interior of the Garfield Bridge shows many carved initials as well as chalked ones that penetrated the timber so much that a 1929 writing looks as if it had been put there recently.

Bridge advertisements were always popular and one still remains on this bridge for such wondrous products as Bancroft's liniment for coughs and colds.

The construction of the interior of the bridge shows details of Town's lattice mode. Ithiel Town, a native of Thompson, Connecticut, developed this kind of truss, a series of diagonally crisscrossed planks attached to one another at each intersection by hardwood pegs called treenails (pronounced "trunnels"). Town sold his truss design throughout the country and it has been said that mor e were built on his plan than on any other in New England. However, in Lamoille County, this is the only remaining public bridge built in this manner. It is very attractive to the sight seer.

SCHOOL NOTES

The National Honor Society inducted nine new members: A. Coty, R. Skinner, E. Skinger, J. Wells, J. Wilkins, S. McMahon, D. Sakash, and B. Ciaraldi. They were chosen for character, leadership, service, and scholarship. The assembly was led by President C. Tibbets with grades eight through twelve.

Last Thursday the Problems in American Democracy class had the pleasure of Mr. Kardos, a Hungarian, who held positions in the Hungarian government, was an economic advisor to the League of Nations, worked in the United Nations office of Food Administration and presently works for the Voice of America. He told about the establishment of communism from 1945 on in Hungary. A question and answer period followed.

Saturday evening the Junior class is sponsoring a dance featuring the Darts, with an admission charge of single: $1.00, couple: $1.50 from eight to twelve in the gym.

The soccer team played LCA Monday at P.A. The score was Stowe - 1, LCA - 0.

4-H

Well, here it is Monday already and I have a full week of 4-H work under my belt. Just can't believe how time flies.

I heard via the office that a number of you folks tried to reach me on the telephone last Monday and Tuesday. Thanks for the try, but the state office planned my itinerary for those two days: Monday was

MIDDLESEX PRESENTS "

The first student production of Middlesex College in Stowe, Vermont, took place Saturday in Stowe Memorial Auditorium at 7:30 in the evening. "Fringe Benefits," a variety show, included skits, musical numbers and impressions.

Master of Ceremonies Al Sweeney of Prospect, Connecticut, first introduced the newly elected President of the Student Council, Wayne Conklin of Peekskill, New York, who greeted the parents and students. The entertainment began with Bill

Bennington, N.H., May Rebuild

But It Won't Be the Same

Oldest Covered Bridge Gone

BENNINGTON, N. H. — When fire-ravaged covered bridge finally toppled into the Contoocook River, down went a picturesque relic of railroad history.

Built in 1877, it was the oldest wooden covered railroad bridge still in use in the United States. It was a good-sized bridge, too, running more than 100 feet over its wooden trestle.

For nearly three-quarters of a century, it had survived the huffing and puffing of steam locomotives, only to fall victim to a modern-day diesel engine.

The town's fire chief, Charles Zabriskie, said he ? and Boston & Maine R.R. men came to the canclusion that a spark thrown off by a diesel started the fire.

The bridge burned on Apr. 30, a breezy day, and as Fred Sheldon, chairman of the selectmen, recalled, "it went up in no time."

The railroad got right to work in repairing the functional part of the bridge. A work crew of 20 men beefed up its underpinnings and had it back in service. A train moved across it May 15.

A. T. Easley, the vice president and general manager of the Monadnock Paper Co., near the bridge at Bennington, said the railroad did a "well-organized and intelligent job" in repairing the bridge.

The paper company was fortunate on at least two counts. For one, it wasn't set on fire by sparks from the burning bridge. For another, it had enough material on hand so that its operations weren't curtailed, Easley said.

The spokesman for the railroad, which had an engine and some freight cars stranded on the Hillsborough side of the line, said "we feel rather proud" that Monadnock's service was not interrupted. Also, he said, because the design for the repairs and the work went on simultaneously.

But he was more pessimistic about restoring the wooden cover that housed the bridge. "There are probably not two men left in New Hampshire who could duplicate it," he said.

A new structure would still be a fire hazard, said the spokesman. If it were rebuilt, he added, "it would be just another covered railroad bridge."

For railroad buffs, there are still three other covered bridges in New Hampshire for them to see: at Hillsborough, Goffstown and Franklin Falls, where the tracks run on the roof of the bridge.

"We sure do miss it," Selectman Sheldon said sadly. "If we put up another, it would look like it, but it would never be the old bridge again."

End of an Era

Railroad bridge in Bennington, N.H., burns down.

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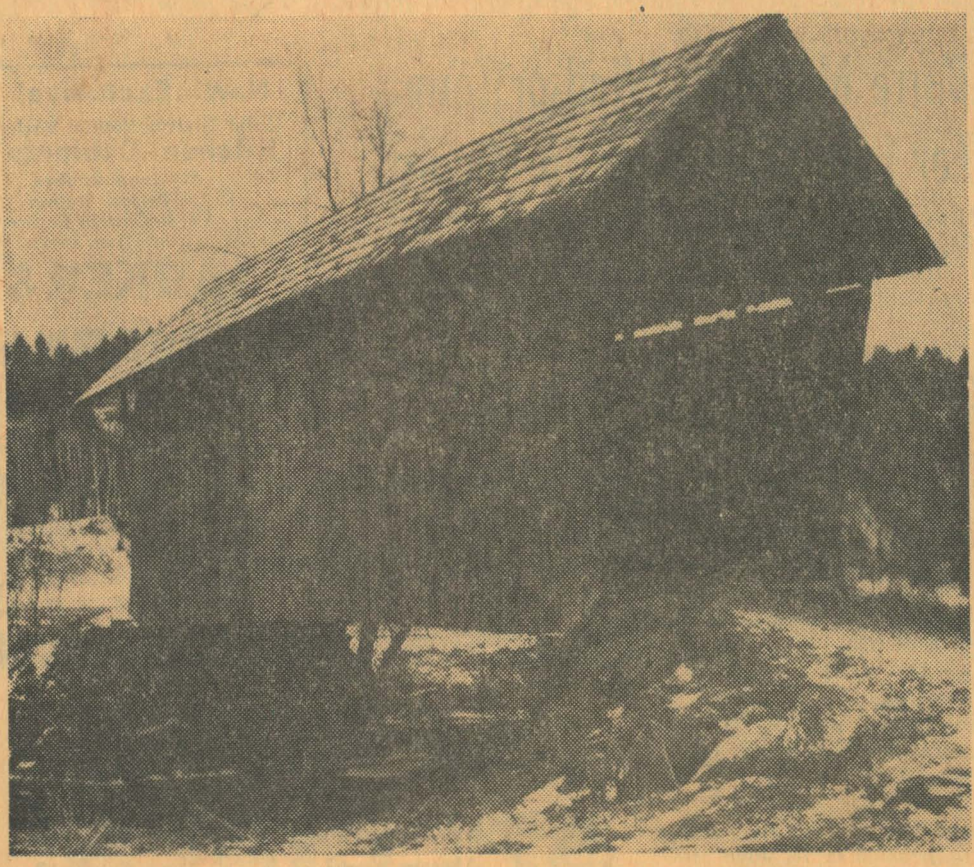


The Orton Bridge has faced many cameras.

Central Vermont

Wooden Bridges: They Span Time, Rivers

By MAVIS DOYLE

MONTPELIER — Central Vermonters are proud of their covered bridges. Many are at least 100 years old.

Washington County with 16 of the historical spans, is tied with Windham County for the most remaining covered bridges per county.

Lots Of Pictures

Probably the most photographed bridge in the county, if not in the state, is the Orton Farm Bridge located between Marshfield and Plainfield.

The old time bridge stands beside busy U.S. 2. During summer, tourist cars are often stopped nearby while out-of-staters snap pictures.

The bridge spans the Winooski River and leads to a cow pasture owned for many years by C. E. Orton.

The 60-foot bridge was built in 1889 by Herman Townshend of Marshfield, who was a well known bridge builder.

Mr. and Mrs. Orton sold their farm in 1959 and now live in a trailer directly across the road from the bridge.

Ed Barcomb of East Montpelier now owns the bridge as he bought the farm land in that section of the farm from the Ortons.

It's Still Used

The bridge is still operational and was always used by the Ortons. In the late 1920s, he shingled the roof, Orton recalls, and before that the abutments were repaired and lining planks were laid on the floor.

The Coburn Bridge: Once its rafters rang with music.

A most unusual feature of this bridge is a gate in the middle. This was built to be closed when the cows were across the river in the pasture.

"And it was the only way we could keep them over there once they found the bridge was the way home," recalled Orton.

Another Marshfield covered bridge which stood for nearly 100 years, had to be demolished in 1962 after it was extensively damaged by a truck.

This, too, was a privately owned structure, leading to the farm of George Lafiria.

Safe Bridge

But if you want the experience of driving across a covered bridge and this one is apparently safe for a passenger car as a Vermont Highway sign posted on it warns that 10,000 pounds is the limit — you will also find another not far from the Orton farm bridge.

This is the large Coburn bridge spanning the Kingsbury branch of the Winooski River.

It is located on a town road leading from U.S. 2 near the Carriage Inn in Plainfield to North Montpelier.

One of the legends about this large bridge is that it once served as a gathering place for young musicians from the area.

According to the story the bandsmen rigged a plank across the lateral bracing to make a sort of second floor, where they would practice their band music by lantern light.

Scary Scene

It is said that one traveling salesman was "scared nearly from his wits" when he approached the bridge on a gloomy night.

He told his friends he heard ghostly revels with strange light and music coming from an empty bridge that he could see right through.

And these bridges do look mighty ghostly at night, eve in the mid-20th century.

★ ★ ★ ★ ★ ★ ★

Covered Bridges - Gen.

CANADA

MASSACHUSETTS

CHAMPLAIN

LAKE

NEW YORK

CONNECTICUT RIVER

NEW HAMPSHIRE

Alburg
Isle La Motte
S. Alburg
Swanton
Highgate Ctr.
Franklin
Enosburg Falls
Richford
E. Berkshire
N. Troy
Troy
Montgomery Ctr.
Westfield
Lowell
Irasburg
Orleans
NEWPORT
Derby Line
Derby Ctr.
Morgan
W. Charleston
Coventry
Norton
Canaan
Island Pond
Bloomfield
N. Hero
ST. ALBANS
Bakersfield
Belvidere Cors.
Grand Isle
Fairfax
Cambridge
Waterville
Johnson
N. Hyde Park
Eden
Albany
Glover
Barton
Westmore
S. Hero
Milton
Westford
Jeffersonville
Craftsbury
W. Burke
Sheffield
Wheelock
Guildhall
Lunenburg
Hyde Park
Wolcott
Morrisville
Hardwick
Lyndonville
Concord
WINOOSKI
FERRY
BURLINGTON
Essex Ctr.
Essex Jct.
Stowe
Richmond
W. Danville
St. Johnsbury
Shelburne
Hinesburg
Waterbury
Middlesex
MONTPELIER
E. Calais
Marshfield
Plainfield
E. Montpelier
Barnet
McIndoe Falls
Groton
S. Ryegate
Wells River
Waits River
Newbury
Starksboro
Waitsfield
Moretown
BARRE
E. Barre
Williamstown
Washington
Ferrisburg
VERGENNES
Charlotte
New Haven Jct.
Bristol
Northfield
Warren
Roxbury
Addison
Middlebury
E. Middlebury
Bridport
Cornwall
Hancock
Chelsea
Vershire
Bradford
Fairlee
Post Mills
Ely
Tunbridge
Randolph
Shoreham
Rochester
Orwell
Brandon
Forest Dale
Sudbury
Bethel
Royalton
Sharon
E. Thetford
Pompanoosuc
Norwich
Lewiston
Barnard
Pittsford
Proctor
Castleton
Center Rutland
Castleton Cors.
W. Rutland
RUTLAND
Woodstock
White River Jct.
Fair Haven
Poultney
Middletown Springs
Wallingford
Tinmouth
East Wallingford
Bridgewater Cors.
Plymouth Union
Hartland
Windsor
Felchville
Ascutney
Ludlow
Proctorsville
Gassets
N. Springfield
Springfield
Weston
Dorset
Londonderry
Chester
Grafton
Bellows Falls
Pawlet
Danby
Manchester Ctr.
Manchester
Rawsonville
Jamaica
Arlington
Wardsboro
Townshend
Westminster Station
HISTORIC SITES COMM. BRIDGE
Newfane
Putney
W. Dover
S. Shaftsbury
N. Bennington
Bennington
Wilmington
Brattleboro
Jacksonville
Vernon
Pownal
Stamford
Readsboro

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
MONTPELIER

VERMONT COVERED BRIDGES
March 15, 1960

PUBLIC HIGHWAY BRIDGES

Addison County	
Cornwall	½
Middlebury	1½
Salisbury	½
Weybridge	½
	3
Chittenden County	
Charlotte	3
Westford	1
	4
Grand Isle County	
	None
Orleans County	
Irasburg	1
Troy	1
Westfield	1
	3
Windham County	
Brattleboro	1
Dummerston	1
Grafton	1
Guilford	1
Newfane	1
Rockingham	5
Townshend	1
Westminster	1
	12

Bennington County	
Arlington	1
Bennington	3
Sunderland	1
	5
Essex County	
	None
Lamoille County	
Belvidere	2
Cambridge	2
Hyde Park	1
Johnson	3
Morristown	1
Stowe	1
Waterville	3
	13
Rutland County	
Brandon	2
Clarendon	1
Pittsford	4½
Proctor	½
Shrewsbury	1
	9
Windsor County	
Hartland	2
Springfield	1
Weathersfield	5
West Windsor	2
Woodstock	2
	12

Caledonia County	
Danville	1
Lyndon	5
	6
Franklin County	
Enosburg	1
Fairfax	1
Fairfield	1
Montgomery	6
	9
Orange County	
Chelsea	1
Randolph	3
Thetford	2
Tunbridge	5
	11
Washington County	
East Montpelier	1
Fayston	1
Marshfield	1
Northfield	5
Waitsfield	3
Warren	1
	12
TOTAL	99

(NOTE: A ½ bridge is one located on a town line.)

Historic Sites Commission Bridges

Townshend	1

Connecticut River Bridges

(On the Vermont-New Hampshire State line, but owned by New Hampshire.)

Lemington, Vt.-Columbia, N. H.	1
Lunenburg, Vt.-Lancaster, N. H.	1
Newbury, Vt.-Haverhill, N. H.	1
Windsor, Vt.-Cornish, N. H.	1
TOTAL	4

PRIVATE BRIDGES

Cambridge (farm bridge)	1
Ferrisburg (farm bridge)	1
Marshfield (farm bridge)	1
Northfield	1
Putney (commercial)	1
Shelburne (museum)	1
Weathersfield	1
Wilmington (farm bridge)	1
	8

RAILROAD BRIDGES

Montpelier and Barre Railroad	
Between Montpelier and Barre	1
Rutland Railway	
At East Shoreham (discontinued)	1

St. Johnsbury & Lamoille County Railroad	
At Swanton	1
At Cambridge Junction	1
West of Wolcott	1
Between Hardwick and Wolcott	1
TOTAL	6

VERMONT COVERED BRIDGES

PUBLIC HIGHWAY BRIDGE

BRIDGE ON PRIVATE ROAD

RAILROAD BRIDGE

CONNECTICUT RIVER BRIDGE

INTERSTATE HIGHWAY

NUMBERED STATE HIGHWAYS

OTHER NUMBERED ROUTES

CONNECTING ROADS

INTERSTATE INTERCHANGE

Corrected to Mar. 15, 1960

Compiled and drawn by State of Vermont, Department of Highways

2-'56

P20885

PUT STAMP HERE

POST CARD

N.H./Vt. Plastichrome® Distributor — Don Sieburg, New London, N.H.

Plastichrome® by COLOURPICTURE PUBLISHERS, INC., Boston 15, Mass., U.S.A.

DK-24

Kent's Corner, Colas

This attractive covered bridge has the distinction of being Vermont's smallest.

Photo by Dick Smith

Scoffers Now Think Twice As Interest In Covered Bridges Increases

ANYONE WHO doubts that the covered bridge was the pinnacle of human achievement has not talked recently with Leo Litwin of Arlington.

For Litwin is the enthusiastic president of the National Society for the Preservation of Covered Bridges, a group of some 500 fans who would have us cross from coast-to-coast without ever seeing the rivers that run under our bridges.

Litwin, a concert pianist and teacher, not only is president of the 15-year-old society but also a founder. In fact, the society sort of grew up around him, like moss creeps up a bridge pillar.

For its first four years, the society had a much longer title than membership roll, which contained but two names, Leo Litwin and the late George B. Pease. They jokingly called themselves a "national society" before the idea grew into reality.

For those who care more for bridges than social notes, this quick report from Litwin:

"Covered bridges have been holding their own in the last decade. We have lost a few. I'd say the ledger has about balanced. And, I'd add this hopeful note: the people who live near covered bridges are beginning to appreciate them."

It has been the bane of covered bridge buffs that people who live near covered bridges, particularly in New England, view this Americana with a bit of bitterness.

"Until a few years ago, the natives were avid for concrete bridges," Litwin said. "They felt the covered bridges gave the neighborhood a hickish status.

"But in recent years there have been enough covered bridge buffs out visiting bridges and spending money in the neighborhoods to amend this view."

The only area now making a good thing from its covered bridge potential is Parke County, Indiana, where service stations hand out maps that outline a tour to its 39 covered bridges. A Hingham resident was trapped by one of these maps while on a trip west and lost a travel day in Parke County, burned a tank of gasoline, ate three meals and spent a night in a motel there—even though he was not particularly interested in covered bridges.

The ideal solution, Litwin suggests, for those locations where heavy highway traffic makes a covered bridge a doubtful traffic benefit is a relocation of the road, leaving the covered bridge and its approaches as a park area beside the new bridge. This has been done several places around the country.

George B. Pease, who traveled New England for an elevator company, was the moving spirit behind the revival of interest in covered bridges, Litwin said. Pease's hobby was photographing covered bridges. Litwin took up photography to get outdoors away from the confinement of piano practice.

"I met Pease in northern New England while on a photo field trip," Litwin said. "At the time, I was photographing just anything. He pointed out the advantages of his specialty, covered bridges."

Through four years, Pease and Litwin met occasionally to compare photos they had made on tours. Others began joining them in the hobby. In 1952, they encountered a publicity man who urged them to put out a quarterly bulletin which he offered to edit.

"When the deadline arrived," Litwin said, "the proposed editor failed to follow through. My wife sat up through the hot night of July 4, 1952, typing the first copy of 'Covered Bridge Topics.' "

Litwin's present pride is the current special summer bonus issue of "Covered Bridge Topics", a 32-page issue featuring woodcuts from Harpers Weekly Newspaper that depict the role of covered bridges in the Civil War.

"Those Harpers Ferry woodcuts were so interesting," Litwin said, "that I intend to make my next field trip to that region."

In addition to "Covered Bridge Topics", the Society publishes the most ambitious undertaking yet attempted in the covered bridge field, "The World Guide to Covered Bridges" which lists the locations of 1344 covered bridges around the globe.

Betsy and Philip Clough of Reading are editors of the world guide. He is a research scientist. The guide gives Pennsylvania credit for the most existing covered bridges, 347.

Vermont leads New England states with 121 covered bridges. New Hampshire has 57; Massachusetts, 15; Maine, 11, and Connecticut, 5. Rhode Island has none since the New Haven Railroad covered bridge at Woonsocket was washed away by flood about 10 years ago.

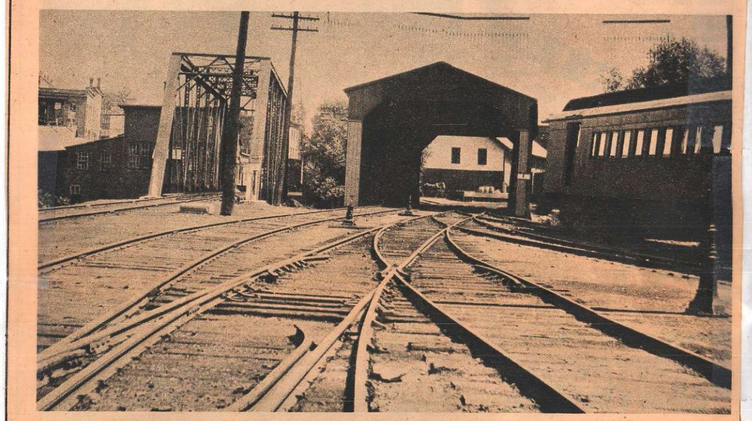
The Society also sponsors outings headed by Mr. and Mrs. Philippe Bonnet of Dorchester who are secretaries of the group. There will be seven of these field trips this summer, the next one being to Ephrata, Pa., Aug. 16 for a tour of Lancaster County bridges.

Litwin says tradition places the first covered bridge over the Euphrates River in 783 B.C. "but no one can prove it."

"The first covered bridge in America has been well established," he said. "It was built in 1805 in Philadelphia."

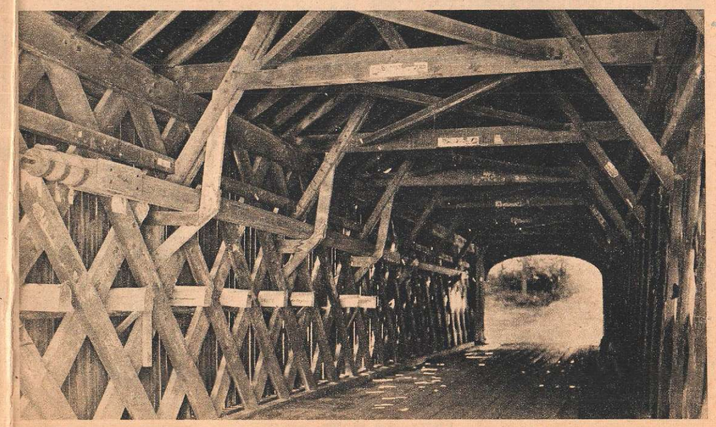
The similarity between the covered bridge and the amusement park "Tunnel of Love" becomes immediately apparent to young adults. But that is not why bridges were covered.

"It is a long-standing tradition that a man has the right to kiss his best girl while riding through a covered bridge," Litwin said. "But the bridges were covered to protect the underpinnings from the weather."

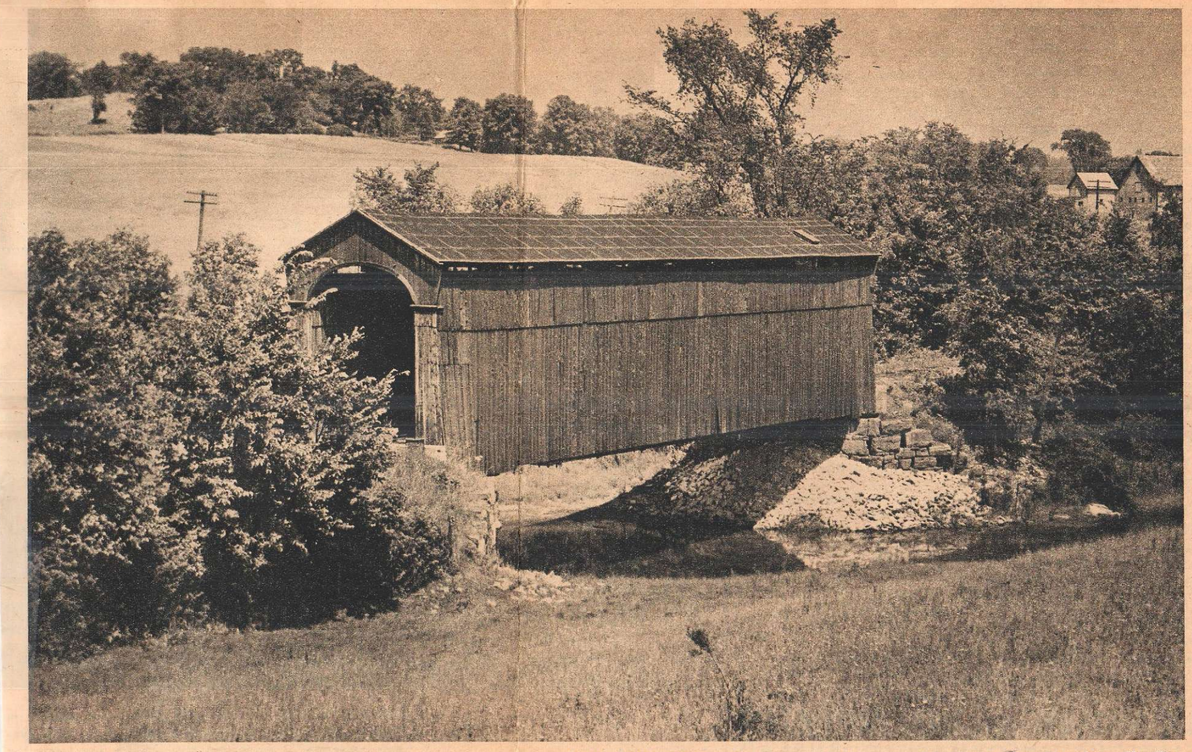


DOUBLE-TRACK RAILROAD BRIDGE at Montpelier, Vt., is among rare photos in the late Edward Hungerford's collection now owned by the Mariners Museum at Newport News, Va. Hungerford pioneered bridge photography.

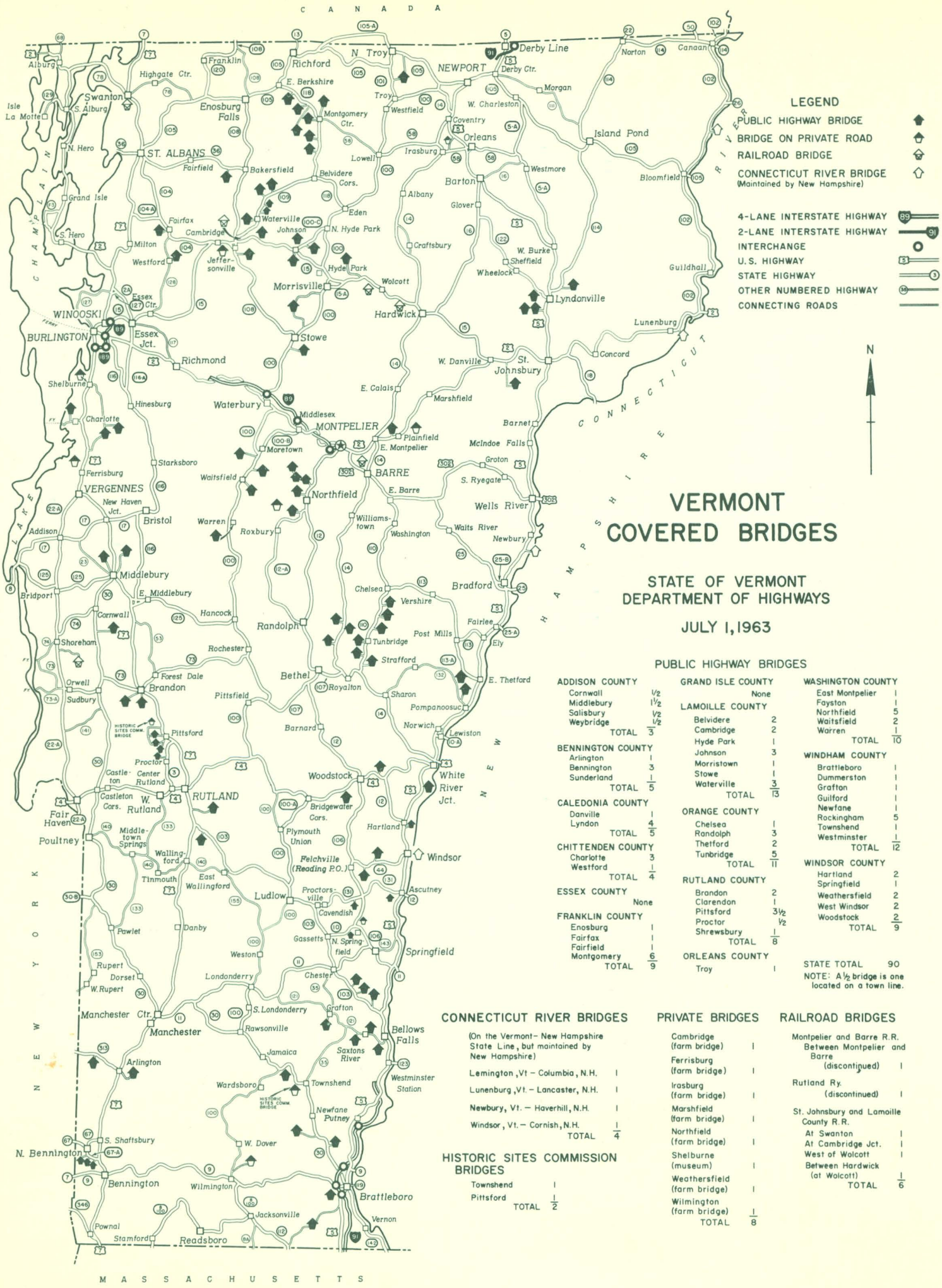
COVERED BRIDGE BUFFS rarely miss an outing like the dedication parade for a new covered bridge at Charlemont. The Covered Bridge Society sponsors many field trips into good bridge country for photographs.



POST OFFICE AND STORAGE as well as transportation are served by this covered bridge over Green River in Guilford, Vt. The town's derrick, a sturdy timber, is stored in the rafters just above the row of mailboxes.



RUTLAND RAILROAD once used this covered bridge at East Shoreham, Vt. The bridge has since retired from the railroad business and now serves as a span connecting a private hunting preserve with the outside world.



VERMONT COVERED BRIDGES

STATE OF VERMONT DEPARTMENT OF HIGHWAYS

JULY 1, 1963

PUBLIC HIGHWAY BRIDGES

ADDISON COUNTY

Cornwall	1/2
Middlebury	1 1/2
Salisbury	1/2
Weybridge	1/2
TOTAL	3

BENNINGTON COUNTY

Arlington	1
Bennington	3
Sunderland	1
TOTAL	5

CALEDONIA COUNTY

Danville	1
Lyndon	4
TOTAL	5

CHITTENDEN COUNTY

Charlotte	3
Westford	1
TOTAL	4

ESSEX COUNTY

None

FRANKLIN COUNTY

Enosburg	1
Fairfax	1
Fairfield	1
Montgomery	6
TOTAL	9

GRAND ISLE COUNTY

None

LAMOILLE COUNTY

Belvidere	2
Cambridge	2
Hyde Park	1
Johnson	3
Morristown	1
Stowe	1
Waterville	3
TOTAL	13

ORANGE COUNTY

Chelsea	1
Randolph	3
Thetford	2
Tunbridge	5
TOTAL	11

RUTLAND COUNTY

Brandon	2
Clarendon	1
Pittsford	3 1/2
Proctor	1/2
Shrewsbury	1
TOTAL	8

ORLEANS COUNTY

Troy	1

WASHINGTON COUNTY

East Montpelier	1
Fayston	1
Northfield	5
Waitsfield	2
Warren	1
TOTAL	10

WINDHAM COUNTY

Brattleboro	1
Dummerston	1
Grafton	1
Guilford	1
Newfane	1
Rockingham	5
Townshend	1
Westminster	1
TOTAL	12

WINDSOR COUNTY

Hartland	2
Springfield	1
Weathersfield	2
West Windsor	2
Woodstock	2
TOTAL	9

STATE TOTAL 90

NOTE: A 1/2 bridge is one located on a town line.

CONNECTICUT RIVER BRIDGES

(On the Vermont – New Hampshire State Line, but maintained by New Hampshire)

Lemington, Vt – Columbia, N.H.	1
Lunenburg, Vt. – Lancaster, N.H.	1
Newbury, Vt. – Haverhill, N.H.	1
Windsor, Vt. – Cornish, N.H.	1
TOTAL	4

HISTORIC SITES COMMISSION BRIDGES

Townshend	1
Pittsford	1/2
TOTAL	

PRIVATE BRIDGES

Cambridge (farm bridge)	1
Ferrisburg (farm bridge)	1
Irasburg (farm bridge)	1
Marshfield (farm bridge)	1
Northfield (farm bridge)	1
Shelburne (museum)	1
Weathersfield (farm bridge)	1
Wilmington (farm bridge)	1
TOTAL	8

RAILROAD BRIDGES

Montpelier and Barre R.R. Between Montpelier and Barre (discontinued)	1
Rutland Ry. (discontinued)	1
St. Johnsbury and Lamoille County R.R.	
At Swanton	1
At Cambridge Jct.	1
West of Wolcott	1
Between Hardwick (at Wolcott)	1
TOTAL	6

2-'56

ROBERT T. STAFFORD
DEPUTY ATTORNEY GENERAL

GREGORY E. L'ECUYER
CHIEF STATE INVESTIGATOR

STATE OF VERMONT
F. ELLIOTT BARBER, JR.
ATTORNEY GENERAL
MONTPELIER

Attorney General

July 21, 1953

GIFTS - PROPERTY - COVERED BRIDGES - HISTORIC SITES COMMISSION

Honorable Vrest Orton,
Chairman, Historic Sites Commission,
Weston, Vermont.

Dear Mr. Orton:

Your letter, addressed to the attorney general, under date of July 3rd, 1953, is acknowledged. Part of it is quoted below:

> "At the last meeting of this Commission it was voted to establish a policy regarding acquisition of covered bridges in Vermont, some of which we plan to preserve in the public interest. The case in point is this: The bridge across the West River at Townsend, owned by the town, has been offered the Historic Sites Commission for $1.00. Our intent is to keep the bridges we are responsible for in repair from the meager funds which our Commission receives. The question is, is it better to take the bridges over by deed from the towns and thus be responsible for public liability, or try to make some arrangement with the towns whereby they retain ownership and we preserve these structures."

Section 4171, V.S. 47, in the portion quoted below, sets forth the authority of the commission insofar as is pertinent to a discussion of the issues raised by you.

"The commission may designate and mark historic sites and buildings by appropriate markers, may receive public and private contributions and acquire, on behalf of the state with the consent of the governor, by contract, purchase, gift or lease, real and personal property and rights therein of Vermont historical significance, and shall manage, preserve and develop the same for the use of the public. * * *"

An examination of the statutes relating to highways shows that control thereof is set forth in section 4903, V.S. 47, as follows:

"The highways of the state shall be known and classified as follows:

I. 'State highways' are those highways exclusively in charge of the state highway board;

II. 'State aid highways' are those highways controlled by the towns and selected as the most important highways in each town, and for the purpose of securing as far as possible trunk lines from town to town, and are eligible to receive under state supervision state aid funds for construction and maintenance;

III. 'Town highways' are those highways exclusively controlled by the towns and over which the state highway board only supervises the expenditure of the state appropriations thereon."

Section 4983, V.S. 47, provides that control of a state highway relinquished by the state highway board reverts to the town wherein situate.

Section 5141, V.S. 47, provides as follows:

"A town shall keep in good and sufficient repair at all seasons of the year its highways and bridges, other than those on the state highway system."

It is to be noted that the language employed in section 5141 is of the type usually construed as mandatory by the courts of this state.

Sections 5216-5220, V.S. 47, provide legal means to compel towns to repair highways and bridges within their limits which are unsafe and section 5231, V.S. 47, permits the indictment of a town which fails to carry out its duties in respect thereto.

Since these statutes are in pari materia, they may be considered together in determining legislative intent.

In re Rushford's Estate, 111 Vt. 494.

In our opinion, the statutes quoted or referred to place control of, and repair and maintenance of, bridges in the towns where same are situate, except those bridges which come under the state highway system. We do not believe that the historic sites commission can properly invade this field by the acquisition of bridges which are an integral part of highways. We are of the opinion that an attempt to do so on the part of the historic sites commission would, in any event, exceed its authority.

We are also of the opinion that an arrangement between the commission and a town whereby the commission paid for the maintenance of a covered bridge would not be authorized by the grant of authority contained in said section 4171, V.S. 47, since no property would be "acquired," either by purchase, gift or lease.

It is suggested that the commission might properly "acquire" by "purchase, gift or lease," a covered bridge where the highway connected therewith had been discontinued. Under such a situation, the reversionary interests of abutting landowners should be considered.

Very truly yours,

Deputy Attorney General

RTS:reh

Landmark In Conservation Report To Be Issued Today

VERMONT PRESS BUREAU

The state Water Resources Board today will order minimum flow regulation of the Connecticut River as well as establishing a maximum river temperature limit.

The order will come in the long awaited case involving the Vermont Yankee Nuclear Power Corp.

The power company wants to use the Connecticut River water for cooling its huge nuclear reactor that will be built at Vernon in the state's first nuclear power plant.

The board scheduled a special press conference at 3:30 today to formally release its order.

The three-page document was kept under wraps Thursday, but it is known that the decision will be a landmark in conservation regulation dealing with thermal (heat) pollution.

"This isn't going to make the power company very happy," said a water resources department spokesman Thursday.

Vermont Yankee has said that it will meet any regulation on the use of the river imposed on it by state government.

But a Water Resources spokesman said Thursday that he expects Vermont Yankee will try to get the board to soften the order when a hearing is called on the matter on May 22.

The three-man Water Resources board plans to call a hearing to hear objections to the order.

It appeared Thursday from conversations with people close to the Vermont Yankee case that the board will say that no temperature increase should be allowed beyond 75 degrees fahrenheit.

The power company was looking for an order allowing it to increase river temperature up to 81 degrees.

If the board sets the 75 degree limit, which is expected, this means that Vermont Yankee is going to have to operate its cooling system much more than anticipated.

This will mean a net reduction in the output of power from the huge plant, which is expected to be ready by 1971.

Vermont Yankee has said that it will install a flexible cooling system at its 540,000 kilowatt plant.

The nuclear power plant will cost in excess of $100 million. It is one of the several being planned by the New England private utilities in New England.

The Vermont Yankee plant is the first one to include cooling towers in its design. Vermont is the first state government in the region to come to grips with the thermal pollution questions.

The company included a flexible system after political pressure from Atty. Gen. James L. Oakes and other state officials.

The board will also establish a variable temperature scale when the river temperature is between 50 and 70 degrees.

The board's order will include controlled increases in the river temperature up to five degrees when the average temperature is between 50 and 70.

This means that the Vermont order will break the compact that now exists between the six New England states.

The Interstate Water Pollution Control Compact says that no interstate river temperature will be increased by more than four degrees.

State water resource officials are hopeful that the states included in the compact will allow this five degree variation because the state feels it is pioneering in regulation of a natural resource.

The minimum flow regulation provision will be a landmark feature too.

The water resources board hasn't before ordered a minimum flow regulation. The board feels that the minimum flow question is central to temperature control.

The Vermont Yankee case has been pending for nearly a year now.

The board has been spending the past three months trying to come up with a final order.

The board was faced with the problem of charting regulation in basically an unexplored area.

The regulation had to be tough enough to balance off the use of a natural resource for future generations against the immediate demands of an expanding industry.

According to one state official, the idea would be to not allow any temperature increase to the river by the power company.

This would mean year around operation of a closed-cycle cooling system by which none of the cooling water is ever discharged back into the river.

This would insure that any existing fish life wouldn't be injured.

But this idea became not feasible because of the fogging and icing conditions in the winter months that would be caused by running the cooling towers, according to a state official close to the Yankee matter.

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nomination sewed up
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Miami convention.
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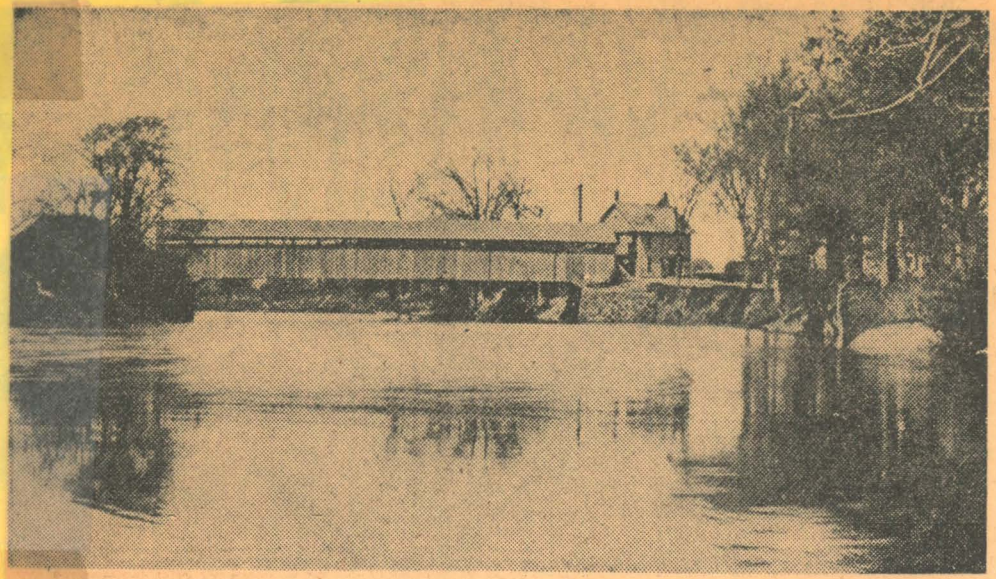
The Old Bridges Vanish

Beloved alike by Vermonters and visitors are state's old covered bridges. Of half-dozen photos submitted to Free Press Old Photo Contest by Clio Gillespie, Jeffersonville, some remain but most have been removed or relocated.



Now at Shelburne Museum

BFP

Landmark for years was double covered bridge at Cambridge, now preserved for posterity at Shelburne Museum's entrance.

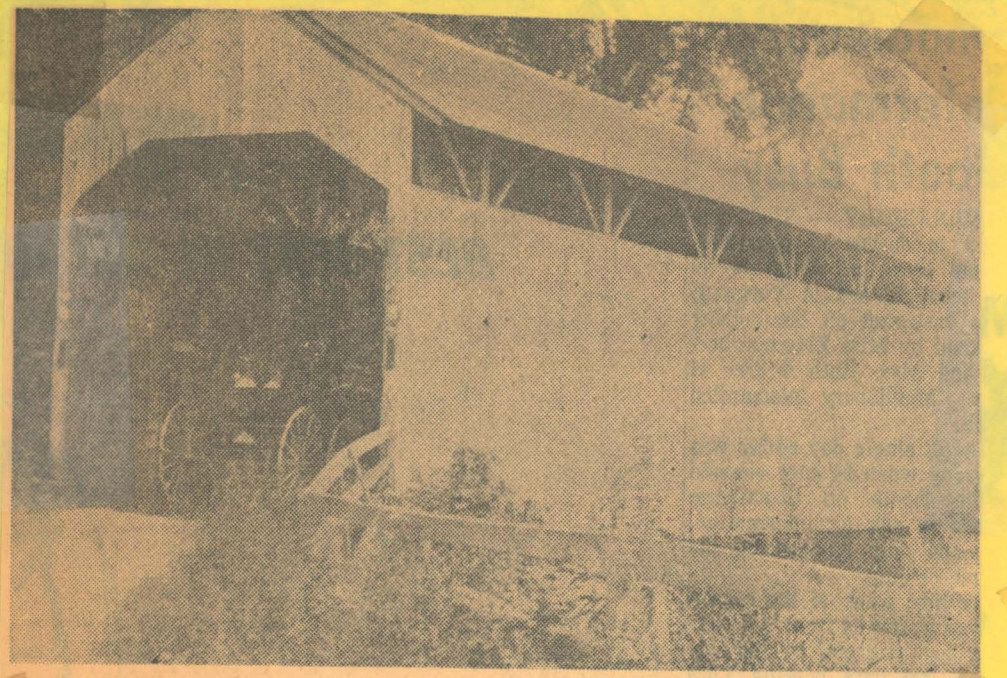
Scott Bridge, Jeffersonville

Sender said present Scott Bridge, located in Jeffersonville off Smugglers formerly called Old Grist Mill Bridge, Notch road, is 125 years old.

7/8/66

Lamoille River

(Picture at left) Covered bridge on Bakersfield road spans Lamoille River says caption on this old photo.



Gone 35 Years

7/8/66 BFP

'Taken down 35 years ago' was Rogers Bridge at Cambridge says sender. Note horse-and-buggy disappearing through entrance.

From Jeffersonville's Past

BFP 7/8/66

Palisade Bridge at Jeffersonville going toward 'Cambridge Bow' was over 100-years-old before it was taken down some years ago.

VERMONT

COVERED BRIDGE STAMPS

Originated, Photographed and Published by

LUCY GRAY LOEKLE
ALLENDALE, N. J.

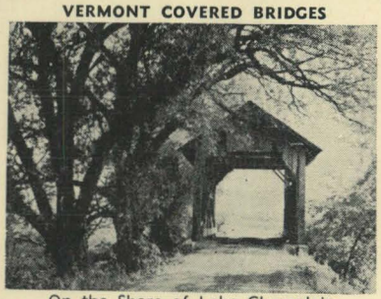
Series Vt.—1

PERSONALIZE YOUR LETTERS
SEAL WITH COVERED BRIDGE STAMPS

Scott

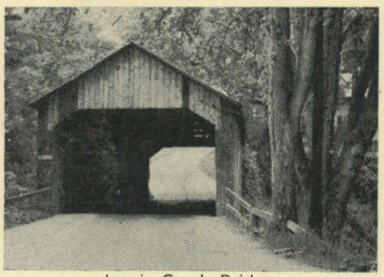
with

VERMONT COVERED BRIDGES



On the Shore of Lake Champlain
Charlotte, Vt.
(Loekle)

VERMONT COVERED BRIDGES

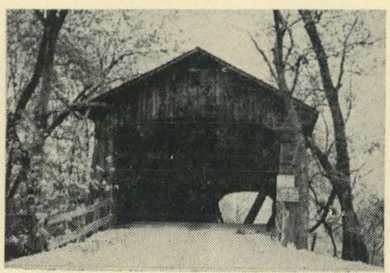


Lewis Creek Bridge
North Ferrisburg, Vt.
(Loekle)

VERMONT COVERED BRIDGES

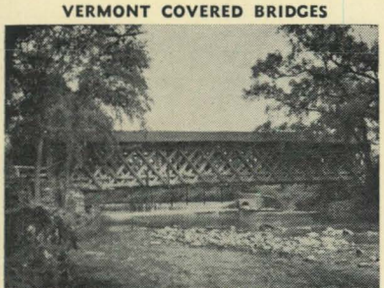
Pulpmill Bridge, double-barreled
Over Otter Creek
Middlebury-Weybridge, Vt. (Loekle)

VERMONT COVERED BRIDGES



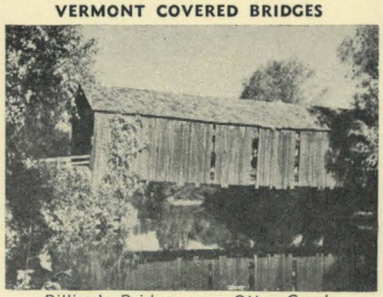
Three Mile Bridge, over Otter Creek
Middlebury, Vt.
Destroyed by fire, 1952 (Loekle)

VERMONT COVERED BRIDGES



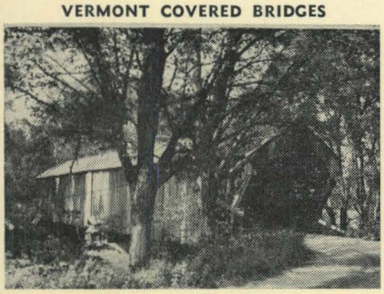
Old Henry Bridge, over Walloomsac River
Bennington, Vt.
Completely restored 1952 (Loekle)

VERMONT COVERED BRIDGES



Billing's Bridge, over Otter Creek
Destroyed by fire, Nov. 1, 1952
Rutland, Vt. (Loekle)

VERMONT COVERED BRIDGES



Bridge over Black River
Weathersfield, Vt.
(Loekle)

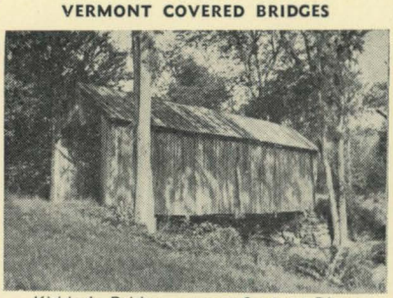
VERMONT COVERED BRIDGES

Pompanoosuc Bridge
Over Ompompanoosuc River
Norwich, Vt. Removed 1953 (Loekle)

VERMONT COVERED BRIDGES

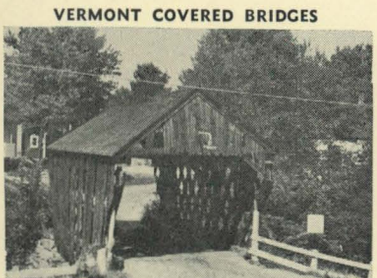
Scott's Bridge, West River, Townsend, Vt.
Entrance to Townsend State Forest
Second longest in Windham Co. (Loekle)

VERMONT COVERED BRIDGES



Kidder's Bridge, crosses Saxtons River
Grafton, Vt.
(Loekle)

VERMONT COVERED BRIDGES



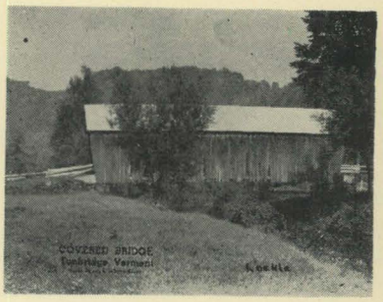
North Springfield, Vt.
Over Great Brook
(Loekle)

VERMONT COVERED BRIDGES

Creamery Bridge, over Whetstone Brook
Brattleboro, Vt.
Built 1879 (Loekle)

VERMONT COVERED BRIDGES

VERMONT COVERED BRIDGES



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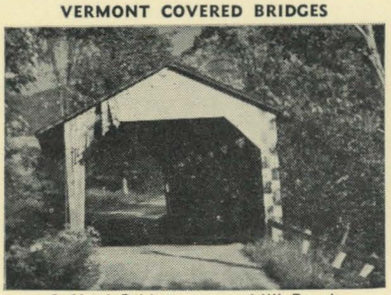
VERMONT COVERED BRIDGES



Safford Bridge crosses Mill Brook
Pleasant Valley, Cambridge, Vt.
(Loekle)

VERMONT COVERED BRIDGES

Fuller's Bridge crosses Black Fall Brook
Montgomery Village, Vt.
Built by the Jewett Bros. (Loekle)

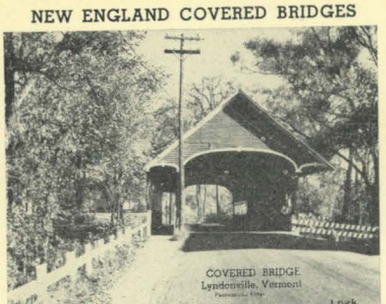
VERMONT COVERED BRIDGES

Northfield Falls, Vt.
Over Cox Brook
(Loekle)

VERMONT COVERED BRIDGES

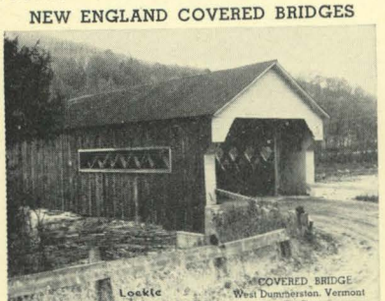
South Randolph, Vt.
Second Branch White River
(Loekle)

NEW ENGLAND COVERED BRIDGES



NEW ENGLAND COVERED BRIDGES

NEW ENGLAND COVERED BRIDGES



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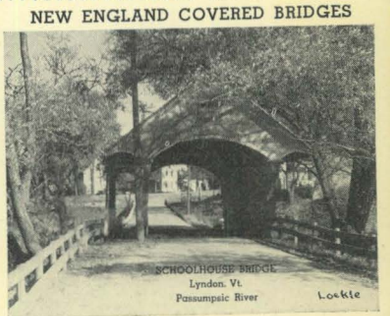

Covered Bridges

June 16, 1976

Arthur Ristau, Secretary
Agency of Transportation
133 State St.
Montpelier, Vermont 05602

Dear Secretary Ristau:

I am enclosing a copy of a letter written to John Gray at about the time of his termination. Possibly due to his leaving, no reply has been received.

There are approximately one hundred covered bridges in the state and a few historic iron bridges. A reasonable estimate would be that over half of these bridges need some attention at this time.

We are regularly funding bridge preservation projects for the towns under our federal grant program, but our funding is such that it is impossible to keep up with the need at the extent that the future of some bridges may now be in jeopardy.

We propose that the Highway Department join with us in a program of assisting the towns in the preservation of these bridges. One possible formula may be: 50% Highway Department bridge funds, 25% Historic Preservation funds, and 25% town funds. I would appreciate your thoughts on the feasibility of this proposal and whether or not it could be accomplished within Highway Department procedure.

Sincerely,

William B. Pinney
Director

WBP/lm

cc: J. Farmer
W. Smith

Enclosure

Brookfield Dist.

cc: Secretary Arthur Ristau
Wendell Smith, Chief Bridge Engineer

May 10, 1976

Mr. John T. Gray, Commissioner
State Department of Highways
State of Vermont
Montpelier, Vermont 05602

Dear Mr. Gray:

Your application for matching funds to repair the Brookfield Floating Bridge has been considered by the Advisory Council on Historic Preservation. It is clear that this historic structure is important to the Brookfield Historic District and to the heritage of Vermont.

We also received many requests to fund other historic bridges that have been listed on the National Register of Historic Places. Under the current program, only a small percentage of the total requests can be funded.

The Advisory Council allocated a significant portion of our available funds in hopes that a Historic Bridge Program could be worked out with the Highway Department, the Division for Historic Preservation, and the towns working together to fund repairs and maintenance of these critical historic structures.

The funding formula the Highway Department offers towns to repair town-owned bridges could perhaps be worked in with our Federal requirements in the grant program. Our office does not know the Highway Department's policy on funding town-owned bridge projects. We would appreciate your advising us on this. We would also appreciate your thoughts on a joint program of funding repair of historic bridges.

Sincerely,

William B. Pinney
Director

WBP:ds