

OUTSTANDING ENGINEERING ACCOMPLISHMENT BY THE N.B. PUBLIC WORKS DEPT.

Steel Span of the Bridge Over the Buctouche River Shifted to the New Foundation in Four Minutes—Cost of Work Was \$68,000.

One of the outstanding achievements in bridge construction in Eastern Canada has recently been accomplished in New Brunswick. The Buctouche River bridge, one of the largest and most important on the east coast of the province, has been reconstructed and the work carried out marks one of the most complete and thorough engineering jobs ever attempted in the Maritime Provinces in the matter of bridge construction.

To the uninitiated the reconstruction of the Buctouche Bridge might have seemed "just another bridge job" but even the public will be somewhat surprised that three steel spans were moved from one set of piers to another in amount four minutes and that traffic on a main trunk highway was held up for but a scant four minutes while this re-alignment was taking place. In other words a complete new bridge was made ready for traffic in such a way that travel was in no way impaired or delayed at that usually busy section. That part of the work on the Buctouche bridge naturally appealed to the public as an indication of efficiency in work and operation, but the engineer is more interested in many of the uncertainties and difficulties encountered in reconstructing the piers of this very important bridge.

Built in 1903

The Buctouche structure was built in 1903-04 and is located at the head of Buctouche Bay, famed for its wonderful oyster beds. The river is navigable for some distance above the bridge and there is a rise and fall of the tide at the bridge of approximately six feet. The bridge was designed by the late A. R. Wetmore, for many years Chief Engineer of the Bridge

Department of New Brunswick, and one of the foremost authorities on bridge engineering in Canada.

The superstructure consists of one through riveted steel truss swing draw span of 283 feet, 9 inches centre to centre of end bearings and two and the other 15 feet centre to centre of end bearings.

The substructure consists of three piers and one abutment; the pivot pier being 37 feet high and 23 feet in diameter and constructed in 32 feet of water. The remaining piers are 32 feet and 24 feet high respectively. These piers are each constructed upon a mass pile cluster foundation, as the river bottom consists of a very soft mud material intermingled with old oyster beds, etc.

The late Mr. Wetmore specified a granite masonry substructure, but because of outside influences on the part of local people native sandstone was adopted instead. This sandstone had become so disintegrated and worn away by frost action in tidal water that for some years past it was not safe to operate the draw span, as the pivot pier would not support the weight of the steel draw span independently.

Teredo Worm A Difficulty

The waters of Buctouche Bay are thickly infested with Teredo worms which are very destructive to wood structures placed in the water. Extra precautionary measures, therefore, had to be taken in constructing the pile trestle temporary to combat this pest, and notwithstanding the fact that the piling had been painted with creosote it was found when the temporary was removed that only about one-

third of the piling remained unseaten. Repairs were made at various times to these piers but nothing of a permanent nature could be accomplished so it was finally decided to remove them down to the foundation and rebuild with concrete and granite masonry. This involved work of considerable magnitude, presenting many difficulties and uncertainties.

Old Piers Dismantled

Owing to the many uncertainties in connection with the renovation of this work, the Department deemed it wise to execute the same under their own supervision by day's work organization. To accomplish this it was necessary to move the three spans some 30 feet down river in order to dismantle the old piers and rebuild upon the same site and foundations, and then on the completion of the new piers and abutments move the spans back to the original alignment. The work was accomplished without interruption to traffic, which is considerable at this point, the bridge being located on the Main Trunk road between Moncton and Chatham; in fact traffic passed continuously while the spans were being moved.

Work was commenced on January 4th, 1932. The truss members adjacent to the tower of the swing span and at the first panel point of the through fixed spans were reinforced for jacking purposes. To remove the steel superstructure very heavy false work was required, on account of the great depth of water and the extremely soft bottom. Eight runways were constructed down stream from the ends of each span and from panel points adjacent to the tower of the swing span. Each runway consisted of 24 rows or 3 piles driven and capped upon which were placed 1) by 12 longitudinals carrying 6 lines of steel rails. The piles in the runway were 60 to 65 feet long, of native round logs and were driven 30 feet into the river bottom. In some cases it was necessary to splice these piles. By placing a steel shoe under the spans they were skidded along these rails by power from four steam hoists, operated from the floor of the spans. About 4 minutes were required to move the spans, which were carried along in unison with traffic operating over the same.

An Extensive Operation

After removing the steel superstructure the piers were taken down by hand to low water; the under water portions being removed by orange-peel bucket. This removal was carried down to the original foundations, which were examined and prepared by a diver. Additional piles were driven in the old foundations and cofferdams placed over the same. These cofferdams were unwaterted and concrete placed in the dry up to 6 feet below low tide line and a granite belt of 14 feet placed thereon. The bridge seats were finished with concrete. The granite masonry was cut to one half inch beds and joints and pointed with lead wool.

To prevent further creeping of the end abutments, the filling was removed from behind the same and two reinforced concrete girder spans of 26 feet each, with concrete palisade railing, were placed, one at each end of the bridge, resting upon open reinforced concrete bents, built also upon pile foundations.

The roadway of the entire superstructure was covered with a new creosoted hardwood floor base with an asphalt plank wearing surface. Some repair work was also made to each embankment approach.

Work Cost \$68,000

The entire work cost in the vicinity of \$68,000.00. 1531 cubic yards of gravel, 290 cubic yards of granite masonry and 8,000 bags of cement were used in the work. From tests made of the concrete entering the structure results up to 5,000 pounds per square inch were obtained.

In undertaking this work the Department was very fortunate in obtaining the experienced and capable services of J. Harvey Cunningham, of Fredericton, as superintendent, who carried it through a most efficient manner.

This work was also carried on as an Unemployment Relief measures and apart from five or six experienced men to take charge of the various units, the crews of workmen were changed every two weeks in order that the work might be distributed as much as possible, so that on the entire undertaking over 70 men were employed. None but provincial workmen were

CONVICT SAVED FROM DEATH BY PLUMBING

Delicate Operation Performed on Prisoner in California Pen.

San Quentin Prison, Calif., Dec. 12—By means of an "outside plumbing system," Jackson E. Ross, 42-year-old convict, was alive today—more than a year after he swallowed a handful of lye in a suicide attempt.

Dr. L. L. Stanley, famed prison physician, conceived the "outside plumbing" Ross after the prisoner's throat and gullet were burned away by the lye.

In June, 1931, Ross decided to cut short his 35-year sentence from San Jose on an assault charge. With his throat and gullet destroyed, it meant that no more food ever could pass from his throat to his stomach through the natural channel.

When Ross was placed in the prison hospital, attaches said he had no chance to live. Food was first injected into Ross. But he wasted away.

Then Dr. Stanley performed another "miracle of modern science." He cut a hole in Ross' stomach to allow food to enter.

Through the "outside plumbing system" Ross now eats ordinary food. He chews it in his mouth, where the food is mixed with saliva fluids. Then the food is placed in a funnel. It travels down the tube outside his body and enters his stomach.

Ross, now eager to live and elated with the device, has gained back every pound he lost.

"It's inconvenient," he declared. "But the results are magnificent."

Dr. Stanley has been in charge of the prison medical department for 18 years. To him, the 5,000 prisoners are part of a great laboratory.

MAGAZINE MADE HIM STAR GAZER

Berkeley, Cal., Dec. 12—A photograph in a magazine changed George F. Tauchman from an average man—working six days a week and putting around his workshop in his back yard—to a full fledged astronomer in four years.

In 1928 Thor Soderland, a friend, showed Tauchman a photograph of a telescope in a scientific magazine.

"I'll build one of those," Tauchman said.

Today he has his observatory in his back yard, constructed entirely by himself, and a large telescope, also built by himself. Although it took him two years to make good his promise, Tauchman has now won all the recognition of the world-famous astronomers who visit him.

He has become a member of the Astronomical Society of the Pacific, photographed moon eclipses, and applied for patents on various types of his home-made equipment.

When Tauchman started his telescope he made his lenses from discarded portholes glasses. They were ground down and polished and then given a coat of silver paint on the back.

He has devised a method of grinding the glass without danger of cracking it. Under ordinary conditions, he says, the process increases the temperature of the outside but leaves the inside cool.

His method is to cut the glass in half and circulate the air through it. The new system is being patented.

Of the hundreds of books bought by Alexander McQueen, he has not found one that has not been of use to him in preparing his NBC broadcasts. McQueen has even found a use for a gazetteer printed in France more than a hundred years ago.

engaged on the work.

The work was under the direct supervision of C. A. McVey, Chief Bridge Engineer, and Mr. R. A. Malloy, Assistant Bridge Engineer, who with Mr. Cunningham are to be congratulated on the success of this undertaking. Indeed the whole project is one that indicates most forcibly the excellence of New Brunswick engineering and the efficiency of New Brunswick workmen.

Make Some Hot Biscuits Today!

Make a dozen delicious biscuits this way. Sift together twice, 2 cups Purity Flour, 2 tspns baking powder, 1 tspn salt. Cream 1 tbspn each of lard and butter and mix with the dry ingredients, using the tips of your fingers. Add ¾ cup each of milk and of water, mixing with knife until you have a very soft dough. Pat out lightly on mixing board until ¼-inch thick. Cut out and bake in hot oven for 15 minutes.

These biscuits—made with Purity Flour—will keep moist for several days and may be re-heated without getting dry.

DELICIOUS SAUSAGE ROLLS—can be made from the above dough, but use half the shortening. Roll to about ¼-in. thick, cover sausages and bake 25 minutes, or until brown, in hot oven (450°).

MEAT PIE COVERINGS using same dough are extra tasty.

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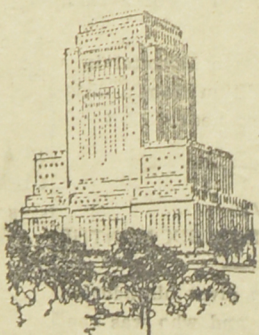
TODAY it is \$635 per capita. With one exception, Canadians are now the highest insured people in the world.

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The rapid growth of the Sun Life is shown in the following table:

ASSURANCE IN FORCE

1871	\$404,000
1881	\$5,010,000
1891	\$19,436,000
1901	\$62,400,000
1911	\$164,572,000
1921	\$536,718,000
1931	\$3,051,077,000



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