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Principal Contents of this Issue

CANADA'S 4,800-FT. CLEAR SPAN

BIGGEST, longest, highest and other superlatives are but fleeting terms in engineering. This truism was again emphasized last week during the discussion of Mr. Svenningson's interesting paper on the long-span, high-voltage transmission line across the St. Lawrence River. This 110,000 volt, overhead transmission line has a clear span of 4,800 feet between towers, and is 400 feet longer than what was previously the longest clear span in the world and which was erected not long ago across the bay at San Francisco. Mr. Svenningson stated that the Aluminum Company of America is now erecting a span over 5,000 feet in length, from one mountain top to another, in one of the southern states. So Canada will possess for only a short time the honor of having the longest clear span of any transmission line in the world.

Nevertheless, there are features in connection with the St. Lawrence span which will likely cause it to remain for some years at least as the most remarkable, if not the longest span of its kind. That the undertaking was quite experimental, and that there are even yet some interesting problems to be solved in connection with it, is shown by Mr. Svenningson's remarks.

The problems faced by the engineers of the Shawinigan Water & Power Co. were complicated to the greatest extent by the fact that the St. Lawrence is a navigable river. It was considered impossible to counterweight the cables and so secure uniform tension instead of uniform sag, because, despite tests on samples, it was impossible to predict exactly what the amount of the sag would be; and heavy ice may be expected occasionally, in the vicinity of Three Rivers, P.Q., before navigation ceases. Just last week there was a heavy sleet along the St. Lawrence and at the same time a 15-ft. tidal wave. A boat passing beneath the span under those conditions would have been in serious danger if an unknown sag had reduced the clearance much below the minimum stipulated by the Dominion Government.

WAR DEVELOPED ORGANIZING ABILITY

IN addressing the electrical engineers last week at Toronto, Sir Robert Falconer, president of the University of Toronto, drew attention to another phase of the after-the-war problems. "Thousands of our officers and men," said Sir Robert, "will return to Canada in better health and vigor than when they went away; but what is vastly more important, they will return with confidence in the future and the capacity for organization and discipline."

We have found as a result of the war that we are fully the peers of the Huns for all of their boasted powers of scientific organization. The whole war has been a triumph of organization, largely of engineering organization,—whether in connection with railway work or other transportation problems, forestry, artillery work, submarine detection and other naval problems, water supply, etc.

"The two great departments of the war," said Sir Robert, "have been the engineering and medical." Without engineering the war could not have been fought at all. Without the triumphs of surgery and medicine that have developed during the war, the toll of human life would have been many times greater.

Canada has been awakened to a new moral sense. We know now what we can do in an emergency. We know that powers of organization awakened throughout the nation will not again become dormant, but will ensure the quick development of every natural resource in the country. These facts, claimed Sir Robert, should give everyone the utmost confidence in the future of this great country.

TRANSMISSION LINE HAS 4,800-FT. SPAN

(Continued from page 478)

In May of this year we found that the sag in the cables had increased by from 24 to 27½ ft. and that in order to obtain the necessary clearance over the channel we would have to take up 24 feet in the sag of the downstream cable and 13 feet and 14 feet in that of the centre and upstream cables respectively.

The amount by which a cable will stretch in taking up a given amount in the sag varies inversely as the modulus of elasticity of the cable. Owing to the low modulus which we worked out for the cable from the results of the tests made at McGill University, we were in doubt as to the amount of take-up required. We found that in order to take up 24 feet in the sag we would need to pull the cable in between 7.2 and 10.4 feet, depending on the value of this modulus.

This cable was taken in about 8 feet with a consequent reduction in the sag of about 25 feet. This corresponds to the result that would be obtained if the modulus of elasticity of the cable were 17,000,000 lbs. In other words, it would appear that from the time of the original sagging of the cable to the time the cable was re-sagged, the modulus of elasticity had increased from 7,250,000 lbs. to 17,000,000 lbs. This change in modulus is no doubt due to the gradual stretching of the cable,