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A BRIDGE TRUSS WITHOUT DIAGONAL MEMBERS.

We are indebted to Mr. G. Leland Fitchett, M. Am. Soc. C. E., for a photograph of a somewhat remarkable highway bridge in Hoosick Falls, N. Y., which is here reproduced. It has a span of 117 ft., with a rise of 12 ft. at the center, and the top and bottom chords are connected by vertical members only. As nearly as can be learned from the photographs forwarded the arch is made of Phoenix columns; but just how the connections are made is not plain. In view of the situation upon this question. Because vast areas of Siberia are undeveloped and uninhabited, and because other vast areas have a climate of almost extreme severity, it is seen by people that Siberia as a country is a bleak, desert region almost incapable of inhabitation and development, and even a very cursory study of the climate, soil, mineral resources, and flora and fauna of the country will show. Space is not available to present the proofs of these statements here, but they are across the country which has been aptly called the "Russian Canada." Little more than a hint at the economic questions involved in the construction of the Trans-Siberian railway has been attempted here, for the paper has been limited to a discussion of possibilities, which, so far as published evidence goes, Americans in general have not adequately considered. This being done we may turn to the more technical features of the enterprise.

Inception of the Enterprise.—As early as 1867, schemes were proposed by various artists, and for the development of railway lines in Siberia. One or two of these hinted at a Trans-Siberian line, but for the most part the proposed lines were comparatively short extensions of the railway system of European Russia into the western territories of Siberia. None of these plans were carried out in their entirety, but as the European system developed, its lines occupied portions of their proposed routes. It was not until the end of 1890 the Russian railway system projected east in three lines whose extremities were Tiumen, Minas and Orenburg. By the same year the advisability of a Siberian extension of the European system had been pointed out to government officials and the problem of construction had been placed in the hands of a special commission. After a careful study of the relative advantages of the above-named towns for a starting point it was finally decided to make the extension eastward from Orenburg and that the eastern terminus was fixed at Vladivostok without question, as other point there was none in any way suitable for the purpose.

In consequence of this decision the construction of the road was determined upon Feb. 27, 1891, and on March 12, 1891, a contract was signed and confirmed by an imperial rescript. On May 12 this rescript was promulgated by the Grand Duke, the Tsar Nicholas, now Czar. That the same year His Imperial Highness formally began the great work of construction. In the same year surveys were commenced from both termini of the route, and by the end of the year the order of construction had been definitely settled.

Route and Country Traverled.—The route finally adopted for the Trans-Siberian railway is shown in the accompanying map. From Chkalinsk to the Old River, the line, with few exceptions, runs through a fertile zone, where the climatic conditions are favorable to the growth of life and the soil is rich and often contiguous depressions. Mercury, lead, tin, copper, salt and other minerals also exist to varying extents, and where there are water routes are working with profit. The precious metals, gold and silver, are also found in a number of deposits much richer than the poorer deposits now worked in America. As yet none of these minerals have been worked in a thorough and extensive manner, owing to the local small demand and the lack of transportation facilities to outside markets.

Space to develop farther this presentation of facts will not be taken, but it will become evident, as the subject is more closely studied, that Siberia, over vast areas at least, is a country lacking development and not a country incapable of development. The principal barrier to this development has been a want of transportation facilities, and realizing this the Russian Government has planned the Trans-Siberian railway, and, besides, is vigorously pushing other railways. Waterway and colonization schemes. There is little doubt that questions of both national and international politics also enter very extensively into the Trans-Siberian railway scheme, or else the immediate expenditure of $270,000,000 in a project, which will not for a long time prove remunerative in the strict monetary sense of the word, would not have been undertaken so cheerfully. This, however, should not make us construe the Trans-Siberian railway solely as a military project, as is sometimes done. What should chiefly concern us is that this road serves to open up to the markets of the world vast natural resources which will ultimately compete with the advantages and resources of the North American countries in supplying European markets.

The Trans-Siberian railway unquestionably ranks as one of the most notable engineering works of this generation, both in magnitude and difficulty of execution. From time to time Engineering News has recorded the progress of this railway and given occasional details relating to its construction. We are now in an advanced stage of the enterprise and the certainty, almost, that its completion is only the matter of a few years it seems desirable to consider the project in a somewhat more complete and comprehensive article. Owing to the easily understood difficulties of obtaining explicit information from a country of Russia's remoteness and character such a discussion must fall in presenting exact structural details, but enough is known to enable a fairly complete comprehension of the general type of constructions adopted, and of their magnitude and extent. In a future article it is hoped to present more detailed information.

Economic Questions.—To understand the economical significance of the Trans-Siberian railway, the possibilities of industrial development presented by the country it traverses must be understood, and there is considerable misconception in this respect. The information from which this article has been prepared has been culled from Russian Government publications, U. S. Consular Reports, the technical press and recent official statements. The government of the Russian Republic has published in the same manner as the government of the United States and Canada, and only in the case of the government publications does it bear the stamp of official authority, but a careful attempt has been made to eliminate all inaccuracies in the unofficial information and as a description of the broad general features of the work it is believed to be substantially accurate.