

ment is down to a scientific commercial basis, or until costs of ores from the Lake Superior portions of the United States automatically reach a higher level, must be somewhat higher than the cost of ores that do not require treatment. It is to overcome this period that a bounty or something of the kind on the production of low grade ores is suggested. Bounties are looked upon with a considerable amount of misgiving, but the suggestion is not made that those bounties should exist beyond a period long enough to produce the ores in question commercially. The problem is one which might very properly be examined by a special committee. It would indeed be a matter of great moment to Canada to have those leaner ores developed and mined.

So much then for the basic features in the elaboration of which we have had primarily in view the holding of the domestic market by Canada for Canada.

#### Labor Element Is Vital Point

There are two important elements of major detail to be considered; one is the question of labor cost and the other the tariff. The cost of Canada's products is vital. This is not a question of the cost of an individual manufacturer's product but Canada's costs as a whole. Is Canada able to keep the cost down, all with a view to insuring that Canada will maintain and develop her position as an exporter? The tendency seems to be towards shorter hours for labor—towards an eight-hour day; I do not know that such a prospect is being or will be received unsympathetically but it is distinctly necessary for labor and what is called "capital" to get together to see what can be worked out, all from the ability-to-compete point of view as the basis. If an eight-hour day through greater freshness of brain or muscle will insure satisfactory output from the factories, both as regards quantity and quality, there should be little to be apprehensive of. The brains of the men in the "plant" must contribute their thoughts, as they surely can do, to the ingenuity necessary to the building up and maintaining of their particular industry in a leading position.

#### Tariff Should Be Carefully Framed

The last important element is the tariff. Now a tariff partakes somewhat of the nature of a two-edged sword. Judiciously employed it may prove of great assistance in the building up of a country's industry with the object of making that country self-contained, and its continuance from a protective point of view may likewise prove advisable. In studying the problem, however, one can hardly overlook the fact that through the agency of a tariff the capital cost of any industrial development, as well as the manufacturing cost, may be prejudiced. The tariff, especially from the points of view of imposition and administration, should at all times receive the closest possible consideration. It would seem the part of wisdom that the general administration of the tariff should be in the hands of a scientific commercial commission well qualified to deal with so important an instrument.

As for the general outlook, no one can expect that transition from a war to a peace footing can be accomplished without any disturbance, but that disturbance may be more or less according to the skill and judgment brought to bear upon Canada's industrial problems in these times. Between the government, the manufacturer and the direct consumer there should be close co-ordination for the first few years of peace times. It is well to bear in mind that in reference to problems of the kind, most of the thinking should have been done, because the time for action has undoubtedly arrived.

The health officer of the city of Stratford, Ont., announces that there was not a single death from contagious disease in that city of 17,000 population during the year 1918. Typhoid was practically unknown, the four cases that were reported having originated elsewhere. He attributes this remarkable record to improvements to the city's water supply.

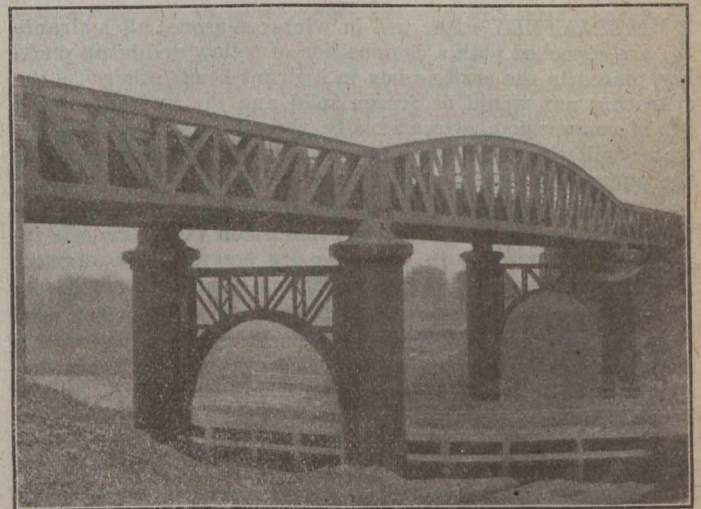
#### AN ENGLISH RAILWAY BRIDGE\*

THE accompanying illustration shows a good example of erection carried out in England, and the following is a description of the work. The bridge consists of a centre span of 112 ft. 6 ins., and two side spans of 59 ft. 3 3/8 ins., with a clear width between the main girders of 26 ft. 6 ins., to allow for two sets of rails 4 ft. 8 1/2 ins. gauge.

The clear headway from water level to the underside of the centre span is about 38 ft. 6 ins. The end abutments and wing walls are built of blue brick in cement, with stone and blue brick capping, while the bedstones under the ends of the main girders are of granite.

There are two intermediate piers, each consisting of two cylinders about 56 ft. long. That portion of each cylinder below the ground level is made of cast iron, and varies in diameter from 10 ft. to 7 ft. Above the ground level the cylinders are 7 ft. in diameter, and are built of steel plates and angles, with an ornamental cast-iron cap at the top.

The cylinders for each pier are spaced at 28 ft. 6 ins. centres, and are braced together near the top with a strong lattice girder.



TYPICAL ENGLISH RAILWAY BRIDGE

The cast-iron portions of the cylinders were sunk under air pressure, the steel portions being sent to the site after having been riveted up at the makers' works and then bolted to the cast-iron portions *in situ*. The cylinders were afterwards filled with portland cement concrete, and topped with granite bedstones, which carry the main girders.

The main girders for the centre span are semi-bowstring type, 112 ft. long, by 12 ft. 10 ins. deep centres of intersections at the centre of the girder, and 6 ft. 10 ins. at ends. The side span main girders are Linnville type, 62 ft. 0 3/8 in. long by 7 ft. 1 in. deep centres of intersections. The floor of the bridge is composed of single web cross girders. The rail bearers each consist of two continuous R.S. joists, 12 ins. by 6 ins., at 44 lbs., the bridge being covered between the main girders with 3/8 in. flat plate flooring. A walking way is provided along the side of each main girder, with a 12 ins. by 4 ins. bulb angle ballast guard on the line side. Along the inside of the main girders is fixed tubing and standards secured to an 8 ins. by 3 ins. channel, to form the necessary parapet. All the spans are provided with fixed and expansion bearings.

In carrying out the erection, it was found that a temporary timber bridge, which was constructed alongside the site at a somewhat lower level than the new bridge (for the use of the general contractor), could be utilized; therefore, very little temporary staging had to be provided. Each main girder of the centre span was sent from the makers' works in suitable pieces for transit, and assembled and riveted up complete on specially constructed steel bogies, at a temporary siding a short distance from the site, and then pulled on to

\*From "Steel Structures," official quarterly journal of the British Engineers' Association, Steel Structural Section.