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THE ENGINEER OF TO-DAY.*

By ST. GEORGE BOSWELL, M.I. C.E., CHIEF ENGINEER TO QUEBEC HARBOR COMMISSION.

The field of civil engineering has extended, I need hardly say, to a great extent within the last 15 or 20 years, and, as a consequence, more is required of the individual members of the profession than was the case formerly. This applies with particular force to engineering in Canada, where there is an immense territory awaiting development, which must be accomplished largely by the labors of the civil engineer. He will be called on to determine the best means of conveying the products of the country to the markets of the world, and his solution of the problem must be such as will enable the producers to compete on favorable terms with their competitors in other parts of the world where, in many instances, owing to the cheapness of labor, the cost of production is less than it is in this country. Grain, for instance, must be carried from the North-West Provinces at a rate that will allow it to compete in European markets with that produced in Egypt or India, where the cost of production is considerably less.

The necessity for a cheaper means of transportation than can be furnished at present by the railroads is already being felt, and has given rise to an agitation for the establishment of a deep waterway between the great lakes and the seaboard.

There is every reason to believe that Canada is as well endowed with natural advantages and resources as

is any other part of the world, and it only remains for these resources to be ascertained and properly developed to place this country in a foremost position as a great producing nation.

It is to the civil engineer that the public must look to obtain a just appreciation of countries' possibilities, and for the means by which they may best be taken advantage of. And, in order that he may fully meet the expectations of the public in this respect, the engineer must be familiar with the geographical features of the country forming the field of his labors, and conversant with all the possibilities and defects of the existing means of communication.

He must also be well informed as to the facilities possessed by other countries for the transportation and handling of their products, and be sufficiently posted in mercantile matters and requirements to be able to determine the intrinsic value of schemes for transport on a purely business basis, and form a correct judgment—here a knowledge of similar engineering works in other parts of the world, with their commercial aspects, is essential.

Comparatively new subjects also demand the study of the engineer. The tendency of the population to concentrate in cities is steadily increasing, one cause for this probably being the introduction of agricultural machinery and the carrying on of farming on, as it were, wholesale principles, by large companies, thus cheapening the cost of certain farm products to such an extent as to drive the small farmer, with little or no command of capital, out of the business. However this may be, the fact remains that the population is centering in the cities, where also the principal wealth is accumulating, and with this increase of population and wealth in the cities comes the demand for better civic arrangements, in, amongst other matters, sanitary affairs, inter-communication—the electric railway taking the place of the horse car—and lighting, thus giving rise to two almost new departments in civil engineering, viz., sanitary and electrical.

When I speak of civil engineering I mean civil in contradistinction to military engineering, i.e., all engineering connected with the development and advancement of civilization, whether railroad, hydraulic, mechanical, sanitary, electrical, or any of the other sub-divisions into which civil engineering may be divided.

Now one of the first questions that naturally presents itself to the beginner is how best to prepare himself for the practice of the particular branch of engineering he has selected as the most likely one to allow full scope to his natural abilities or bent. He has during his college career acquired, it will be assumed, a more or less complete theoretical knowledge of civil engineering in its broad sense as covered by a full course in a well-equipped engineering college. He looks over the field of his future labors and determines to devote himself either to railroad, electrical, sanitary or some other department of engineering, as the case may be. It so happens, however, we will say, that he can find no opening in the particular branch selected. Should he then await his time or take advantage

* A paper read before the Applied Science Graduates' Society of McGill University, and published exclusively in THE CANADIAN ENGINEER.