

Leaving out the question of cost of construction, the next great consideration is time of transit. The canal, if built, will be constructed with the view of shortening the water route between Lake Superior ports and the ocean, and, unless it can cut some time off the present route, it will not be considered as a national highway. Compared with the present water route from Lake Superior to Montreal, this canal would only at best cut one and a half days off the present time, but should the St. Lawrence and Great Lakes canal system be enlarged to a 22-foot canal and the number of locks reduced, just as good time could be made by this system, and no practical benefit in time would be secured. At a probable cost of \$100,000,000, it is doubtful if the Georgian Bay Canal will be built. One-half that amount would complete the St. Lawrence system as a 22-foot canal, and this system would serve a large water front.

In the development of water power the canal would be a large factor. Under present conditions some 150,000 horse-power might be developed along the route. This may be increased to 1,000,000 horse-power by improved methods.

The construction would likely take ten years, involving an expenditure of some \$10,000,000 annually. In a summary of quantities to be moved we find the submarine rock excavation placed at over 8,250,000 cubic yards, and estimated at \$3.50 per cubic yard. The dry rock excavation is placed at 18,500,000, and estimated at \$1.25 per cubic yard. The next large item of cost is concrete, over 1,750,000 cubic yards, estimated at \$7.50 per cubic yard. Some of the other estimated prices are of interest, as second class concrete, \$4.50; granite masonry, \$50; rock-fill behind cribwork, 50 cents.

The Georgian Bay Canal completed in less than twenty years is not an impossibility. It is a greater possibility to-day than the G.T.P. was six years ago. It would be a more daring venture. The G.T.P. has every indication of being a successful commercial venture from the opening of the road. The Georgian Bay Canal would be for many years a charge on the country's exchequer. As a commercial venture it would be a doubtful undertaking; as the plaything of a nation builder it is a possibility.

THE CURRICULUM OF THE ENGINEERING COLLEGE.

For over a month the student at the engineering college has been attending lectures. To the freshmen the various courses appear fearfully and wonderfully made. It is all a strange combination, this calculus and geology, dynamics and chemistry, algebra and surveying, drawing and statics. The relation of these subjects to a course in engineering is hard for him to recognize, the absence of instruction in English literature he cannot understand.

To a man in the final year the irregularities of the combinations of courses of instruction in the Faculties of Applied Science of Canadian Universities are real, and are an evidence that frequently college courses are arranged to suit the whims of university professors rather than the requirements of the engineer.

The curriculum of our engineering colleges should be framed and modified to prepare the graduate for his professional work. Subjects that may be termed culture studies, and purely academic, should not be included in such courses. The increasing professional demands upon the engineer in all fields of work require a corresponding broadening in the engineer's training, and necessitates many modifications in his college course. The technical qualifications required have extended, and the professional man to-day must meet demands not exacted a

generation ago. But aside from his professional work the engineer becomes affiliated with work requiring administrative ability, and he frequently finds himself engaged in such work requiring a more liberal education than usually afforded by engineering colleges. This training he should receive before entering upon his course in engineering. No attempt should be made to crowd such work in a four years' course. Twenty years and more ago a four years' course was adopted, and, although the subjects first taught have been amplified and new subjects introduced, the period of college training remains the same. Both instructor and student realize the impossibility of doing good work under such conditions. Either the engineering college course must be lengthened or a much higher standard of entrance must be required.

CANADIAN NORTHERN RAILWAY.

The report of the Canadian Northern Railway for the year ended June 30th, 1908, deals with larger figures than the previous one. In a year, which has witnessed heavy depression in all branches of industry, the company has been able to earn bigger earnings, both gross and net, than ever before in its history. This was the first complete year that the company operated the Qu'Appelle, Long Lake and Saskatchewan Railway, between Regina and Prince Albert. Part of the increased receipts was doubtless due to that fact, but reports from the system generally show a steady and progressive advancement.

The following table compares the principal figures for the two years:

	1907	1908	Per cent. inc.
Miles	2,509	2,850	13
Gross	\$8,350,198	\$9,709,463	16.28
Per mile	3,328	3,388	1.8
Maintenance of way and steel	\$1,260,960	\$1,486,030	17
Maintenance of equipment	1,033,369	1,330,067	28
Traffic expenses	90,787	120,284	32.6
Transportation	2,820,782	3,486,639	23.6
General expenses	218,266	253,756	16
Total expenses	\$5,424,164	\$6,676,776	23
Ratio to gross	73.49	74.10	
	1907	1908	Per cent. inc.
Net	\$2,926,034	\$3,032,687	3.64
Per mile	1,166	1,058	- 9
Fixed charges	\$1,882,489	\$2,353,757	25
Surplus	1,043,545	678,929	-34

It will be observed that the increases in gross earnings generally proportionately exceed the increased mileage operated. Perhaps the most striking feature of the improvement is the gain from passenger receipts, being \$381,831, or 26 per cent.

	1907	1908
Passenger	\$1,464,258	\$1,846,087
Freight	5,941,729	6,824,722
Mails	58,231	72,919
Express	85,124	107,266
Miscellaneous	1,000,856	858,407

Heavier expenditure in bringing up the standard of the roadbed and track and enlarging station accommodation, freight sheds, sidings, and other necessary facilities to meet the increasing demands of traffic account for the increase in working expenses. The shops and yards at Fort Rouge at Winnipeg, involving an outlay of a million dollars, are in part completed and have already proved of benefit. The new engines houses at Brandon, Dauphin and Saskatoon have been completed. The Fort Garry station, Winnipeg, it is hoped, will be completed in about eighteen months. This will be the property of the company, with the Transcontinental and Grand Trunk Pacific as tenants.