

of the German engineers, given at the great engineering laboratories of the Fatherland and in the research laboratories of the large industrial corporations, manned by the graduates of these universities. Does not a great measure of German success lie in the fact that they can in a great number of cases produce better goods at less cost, through improved processes, which are the result of careful, continuous and painstaking scientific research? In Canada in a great number of cases the difference between failure and success to produce dividends, does not lie in the cost of raw material, high wages or in imperfect factory organization, but in the wastes, in the processes of manufacturing and in the treatment of the bye-products.

Supposing the Government aid secondary technical education to produce intelligently trained workmen and our universities continue to turn out men prepared to become engineers, thoroughly trained to direct the product of our technical schools, are our manufacturers educated to the point of making use of them?

Up to the present it is a lamentable fact that our industrial corporations refuse to give our young graduates a fair show, and consequently many of our brightest graduates are still drifting across the line, where their abilities are recognized and their services properly remunerated. In the United States the engineering faculties of universities are turning out six or seven thousand graduates every year, and they are all snapped up immediately by manufacturers, railroad companies and engineering corporations. In fact, most of the best institutions cannot supply the demand for engineers and chemists of all sorts and students who have been trained along scientific lines. These men go into manufacturing establishments, and if they are the right kind and have been properly trained, the manufacturer is regarded as short-sighted, indeed, who does not realize the man's ability and give him an opportunity to do the work he is especially fitted for. Take the Steel Corporation—the great Trust—about which so much is said. It is largely manned by young men—men who have come out of colleges within the last ten years. Some not over twenty-five or twenty-six years of age are superintending some of their finest plants and getting \$6,000 to \$8,000 a year. These men never received any training at all except the college training, and then went in at the bottom of the Steel Corporation's works. Their ability was soon recognized, and they were pushed on. It would probably be a revelation to some to see how young the men are who are in charge of these works.

Canadian interests seem slow to follow in the footsteps of their fellows across the line, but conditions are rapidly approaching which must make some change expedient. We are rapidly approaching the condition the United States reached ten years ago. "A wealth of raw material was ready to hand. An excessive tariff, a facility for business intrigue, which compensated for waste in the factory by combinations to eliminate competition, and the needs of an expanding and not too particular population; all these combined until a few years ago to cause waste in manufacture. Then came over-production, in business intrigue there was no more to learn, raw material had accumulated in the hands of the few, and the tariff, high as it was, could no longer exclude many goods made under scientific supervision. American manufacture was approaching a crisis, and began to realize that safety

lay only in efficiency. To-day few men have any idea of the ever-increasing anxiety of the American manufacturer to secure factory efficiency." Already the supply of research chemists, etc., is inadequate, and during the next few years the need must be increased.

It would be interesting to know the reason of the lack of intercourse between our Canadian industrial corporations and our universities. Does it lie in the conservatism of the manufacturer or in the inefficiency of our graduates? Assuredly not the later, for our men go across the line and hold their own with the best. Some Canadian industries are using a large number of our men, but these, like the Westinghouse Company, are Canadian branches of American corporations.

A canvass of our leading business men has revealed a remarkable ignorance of just what our universities are doing along the line of technical and engineering education. Their knowledge of student action is confined to athletics and highly-colored accounts of street rowdiness.

EDITORIAL NOTES.

The total tonnage of freight handled by Canadian canals for the season just closed was 32,735,898, as compared with 17,103,613 last year, or an increase of 15,632,285. The increase in the traffic of the "Soo" Canal alone was 14,533,611. The Welland Canal showed an increase of 308,944 as compared with last year. The only canal which shows a decrease in traffic is the Trent, which dropped behind last year's record by 21,738 tons.

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On January 4th the Railway Commissioners for Canada will consider the advisability of issuing an order prohibiting brakemen from riding on the top of freight cars. Such an order has long been required. In countries where the traffic is much heavier than in America the movement of trains is accomplished without standing or running over the top, and it can be successfully worked out here. Such an order would make it possible to reduce the overhead bridge clearance to about seventeen feet, thus making it possible to more easily do away with many level crossings.

COMING MEETINGS.

Montana Society of Engineers.—January 6-8. Annual meeting at Butte, Mont. Secretary, Clinton, H. Moore, Butte.

American Association for the Advancement of Science.—December 27. Annual meeting at Boston, Mass. Secretary, L. O. Howard, Smithsonian Institution, Washington, D.C.

American Society of Agricultural Engineers.—December 28-29. Annual meeting at Ames, Iowa. Secretary, L. W. Chase, University of Nebraska, Lincoln, Neb.

American Society of Engineering Contractors.—Feb. 24-26, 1910. Annual convention at Chicago, Ill. Secretary, Daniel J. Hauer, Park Row Building, New York, N.Y.

Indiana Engineering Society.—January 14-16. Annual convention at Indianapolis, Ind. Secretary, Chas. Brossmann, Union Trust Building, Indianapolis, Ind.

Michigan Engineering Society.—January 12-14. Annual meeting at Lansing, Mich. Secretary, Alba L. Holmes, 574 Wealthy Ave., Grand Rapids, Mich.