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The Need of a National System of Technical Education.

By Dr. Frederick H. Sexton, Director of Technical Education, Nova Scotia.

AT a special evening meeting of the Canadian Club Dr. Frederick H. Sexton, was the guest of the organization, and delivered an address upon "The Need of a National System of Technical Education."

Mr. Sexton said: *Mr. Chairman and Members of the Canadian Club of Toronto,*—I need not tell you how glad I am to come here to Toronto to discuss with you for a short time a subject that is near to my heart. Almost within the year, you have been addressed by President Falconer on "The Necessity for Breadth in the National Outlook." I can do no better than to follow his illustrious example and emphasize some concrete aspect of another necessity of national significance. I would engage your attention in the consideration of a question which to-day promises as much or more national potentiality to Canada than any other which is clamoring for public action. I refer to the question of Technical Education, and by "technical education" I mean any education which particularly trains for any of the useful arts, sciences and trades.

The strength of any community or nation depends on the total physical, mental and moral well-being of its individual members. These three are so interdependent that it is difficult to have one without the others, and the enhancement of one will materially increase the others. Since, in the process of evolution, man ascended from the physical to the mental and moral, it is but natural to regard the physical as the side of human nature that demands the primary ministrations and the others follow in due order.

It is necessary, if the average man would attain to high morality and intellectuality, that they should be lifted from conditions of squaler, hunger and poverty. A family should be well-fed, securely and cleanly housed and well-clothed, if we would have them good, clean-living, morally upright citizens such as any community desires. In order that this

family state may be realized, the supporter of the family must work; he must be a producer. For his production he must receive an adequate remuneration as measured by the value of the necessary commodities for a fair rate of living in his special community. The ambition of the average family is to obtain all the necessities and some of the comforts of life and, to rear and educate its young, outside of the oppression of poverty and want. The usual contribution of the supporter of the family to the social order in return for his living is, then, his work—his special productive activity. Here lies the nation's intrinsic wealth and strength—in the summation of productive and intellectual capacities of the individuals comprising that nation. The work of the separate members is naturally of different kinds.

It is assumed that every normal member of society to-day shall have some occupation that shall make him self-supporting at least, if he is but given the opportunity to exercise it, and that he shall contribute to the productive activities of society. A necessary corollary to this assumption is that each person shall have some chance to acquire a training for one of the many branches of organized production. That these principles are generally accepted is easily shown by the great pains that are taken to bring a few abnormal members of society as far as possible under normal conditions. Such cases are instanced in the expensive training of the deaf, dumb, blind, mental defectives, toward some occupation for which they are more or less adapted so that they may become in part self-supporting. I think no more emphasis is needed than the mere statement to convince you that, *if no other way is provided,* the state owes it to the individual to provide such facilities that he may train himself to be a producer—a worker.

No one will contradict me if I say that there is to-day a most generous provision for the training of our youth for the professions and for general leadership. There is a carefully graded progression of courses in our public schools, fitting exactly upon one another from the entrance in the primary school to the graduation from the high school. This last course is so molded that it exactly fits the matriculation requirements of the University. In the University, a man is given a liberal cultural education of the highest order, or is trained for the professions of the ministry, medicine, law and now engineering, for a fraction of what it actually costs to train him. It is right that the chances for such training should exist and it is *generally recognised as* right. We must remember,

however, that this domination of the public school system by the university is a condition transmitted to us from the time when the training of the other workers was provided for in the apprenticeship system and the home. To-day these latter institutions are entirely inadequate, as I shall show you later, and still the common schools are carried on in much the same way as they were many years ago, when the demands on them were widely different.

To-day we find that about 4 per cent. of men in gainful occupations engaged in the professions. We find 75 per cent. in the industries, agriculture, fisheries, mining and manufactures, trade and commerce. The whole public school after the eighth grade at least, is run almost entirely in the interests of the 4 per cent.—and the 75 per cent. are treated to precisely the same curriculum, with the result that they leave in hordes at the legal age limit of compulsory attendance. Common schools, high schools and universities work hand in hand to give us the clergyman, doctor, and lawyer, but they have done little of specific value to train the great rank and file for a livelihood. As a nation, we are not giving the *majority* of those who *need* it, a chance to learn HOW TO WORK. We are not even giving the great majority a chance to find out what vocation or life activity they are most fitted for. On our system of public schools we are not training our workers so that they step from the schools into actual life and take up their share of responsibility and activity readily and intelligently, ensuring increasing success to our industries and an adequate living to themselves. Herein, gentlemen, we are violating a fundamental and sacred principle of that democracy of which we are wont to boast—the greatest good to the greatest number.

It is very apparent to-day that this nation is endeavoring to afford men the *opportunity* to work.

I need not go into this matter because our policy in this direction is so well recognized. The whole fabric of protective tariff, the bounties to infant industries, building of railways, canals, safeguarding the waterways, all this huge restrictive, stimulative, and constructive policy is for the direct purpose of giving a chance for every Canadian, as well as many others, to work in developing our tremendous natural resources. We actually go a step further and attempt to save all the gain from this development to Canadians themselves.

If it is a national duty to stimulate great industries, is it not a national duty to prepare great workmen? I am sure that

we do not want to be a country that exports enormous quantities of raw materials and imports a large proportion of the manufactured goods it consumes. To-day, Canada imports nearly one-half of all manufactured goods in spite of the protective tariff and all the other strenuous efforts to stimulate industry. We shall never be a self-contained country until we have such a great body of skilled artisans that we can make everything we need from the crudest to the finest articles and at such a cost of production that we need not fear the keen competition of the rest of the world. Again and again, the manufacturers have proclaimed the great dearth of skilled labor. The kind of labor demanded to-day is the kind that works with both head and hand, men who have had both school and shop training, men who will invent special methods to improve the manufacturing processes in which they are engaged, men with "industrial intelligence." Such men can be trained only by an adequate system of technical education.

Just consider the number of our men that such education would benefit. To-day there are about 34 per cent. of all the men in gainful occupations engaged in agriculture and fisheries, and about 26 per cent. in mines and manufactures,—over 60 per cent. of all the supporters of national life. Surely a need affecting such a great proportion of the population is worthy of national consideration. And yet the public school system after it has completed the elementary instruction that is necessary to everyone—the teaching of reading, writing and arithmetic—is conducted mainly for the benefit of a small twenty-fifth who are not producers!

There are practically 16 per cent. of all men in gainful occupations engaged in trade and commerce. Lately the business men have interested themselves in education. They have demanded that some training for a business life shall be given in the public schools. We have witnessed the introduction of commercial courses, such as business arithmetic and English, type-writing, bookkeeping, shorthand, etc., and have approved. Still the great majority—the 60 per cent.—are not given special training toward *their* specific life work and yet we hear on every hand the incessant demand for trained artisans, skilled mechanics, intelligent agriculturists.

The greatest industry of each province and of the whole Dominion is agriculture. Almost within the year, you have been addressed by the President of the Agricultural College, which is the pride of Ontario and the envy of other Provinces. He has shown you that the conditions surrounding the agri-

cultural industry to-day are fundamentally different from what they were a few years ago. He has proven to you that the application of science to agriculture has resulted in tremendous benefit to the Province. He has expressed the hope that the true principles of scientific agriculture will yet come to be taught in the rural school to the boy while his time is not yet of much commercial value. If as he has shown you how a little science and initiative can save the export pork industry of a province when threatened with extinction and build it up to $20,000,000 annually; if experiment will increase the barley crop $2,500,000 a year; and will increase the annual oat crop $20,000,000 in one province; surely such methods are worthy of the attention of the Dominion to a further extent even than they receive to-day.

It is necessary that each boy in the rural schools should be given the chance to learn the experimental method as applied to agriculture and the most advanced and thorough agricultural science. To-day the rural teachers are not paid enough for the Government to insist that they should possess training in agriculture. As it is, these teachers are more or less imbued with classical and cultural ideals. The farmers' boys are educated away from the country instead of toward it. The adequate agricultural education cannot be given in the rural school, the special county agricultural high school cannot be established, our farmer boys cannot be properly trained for their life work and multiply the increase of the land until the Dominion assists the province to a greater extent even than now. This co-operation should, I believe, be in the form of a national system of technical education with adequate provision for our greatest industry—agriculture.

Let me says right here that in such a national system of technical education, it would not be right to interfere in any way with our educational system as they exist to-day. What we want is not any policy of substitution or subtraction, but of addition. Provinces should not fear for their provincial autonomies because technical education would consist of separate courses or separate schools articulated with our present schools. It is right and necessary that the Dominion should assist the provinces by giving them grants for this purpose as a part of the national functions in advancing the progress of trade and commerce.

The industrial conditions have changed fundamentally in more than agriculture. The last century has seen the growth of the factory system of manufacture. With increasing devel-

opment, the subdivision of labor, and the introduction of machinery has gone on a pace until the majority of the factory workers are now almost parts of machines. The application of science to manufacture has been no less than in agriculture. An artisan of to-day should know more than he did years ago and has less chance to learn it.

The old apprenticeship system used to give the workman the whole of a trade when the method of labor was quite different and the crafts depended more on skilful hand-work than at present. The master workman used to have his apprentices commonly at his own table and took a great deal of pains usually in making the apprentice a competent journeyman. We know very well that this system is inapplicable to our condition. To-day, the old apprenticeship system is decadent in most trades. It is not dead but sleepeth.

True, a new system in arising, but it is far from proving that it will adequately train the rising generation to become the class of workmen that we desire for the future of the Canadian industries. This modern apprenticeship system is bound to have serious educational drawbacks because the boy who is indentured to the shop must be regarded as an economic factor and must produce enough value during his period of service to pay his way. Most of the modern systems insist that the boy must receive the science, the related mathematics and mechanics and drawing upon which his trade is based. In a few cases, classes in these subjects are held in the shop during working hours and the boys are paid the same rate for their time as if they were at work. The very fact that the progressive industrial establishments have taken up a more thorough training combining science and shop for those entering their works shows the great need of such education. If they are to succeed as corporations they must have all-round competent men with initiative and intelligence to conduct and superintendent the larger operation of modern industry. This shows the need of technical education from the employers' side.

The great numbers enrolled in the correspondence schools shows the need of technical education from the *workman's* point of view. In our little Province of Nova Scotia we estimate nearly $70,000 a year is sent to the United States for correspondence courses. In New York State it is estimated that $6,250,000 is spent annually in a like fashion. Both the modern apprenticeship and the correspondence school are run on a money-making basis for private interests and

hence cannot be accepted as wholly desirable. The need of technical training is made evident for both employers and employed and a wholly suitable provision not made for it.

And how does the public school meet this need? It meets it as I have said before in so far as it teaches the boy how to read, write and figure. Beyond that it does not give the boy destined for an industrial worker much that will be of immediate practical value when he leaves school. It does not give him much either that will be of specific use to him in the occupation which he enters. From 80 per cent to 90 per cent. of our boys leave school when they are 14 years old. The public school not only lets them go but makes them go. It makes them go because it does not offer any real courses that prepare the boy for earning a living. The pupil becomes dissatisfied with the prosy book instruction he receives and hates his lessons. At this age, boys' instincts are constructive and creative. He sees a life before him of a craftsman and he desires to do practical work. Nothing that is offered in school appeals to him. He sees that even manual training in only playing at real work so he takes his first opportunity to leave school and starts out on life's road. Good material is lost to the industries which two years more of practical vocational training in school might have developed into splendid workmen. It is a great pity to let boys go to work so illy-prepared for gaining a livelihood. This problem of keeping boys at school between the ages of 14 to 18 is one of the greatest that confronts educationists and confronts the public to-day. It is high time that the question should be agitated throughout the Dominion and some concerted action taken upon it.

This fair city of Toronto, which I was led to believe was the Athens of Canada, and believe still more so since I have come here has done a good deal in this direction of technical education. Nearly twenty years ago you established a technical High School and have carried on evening industrial courses in connection with it. I know from my own limited acquaintance some men in responsible industrial positions to-day who trace their success to instruction in this school. The evident need of such instruction in this great manufacturing centre, with its 70,000 or more workers has led you recently to appropriate a very large sum of money to give enlarged facilities in this direction. This is an earnest of your conviction of the pressing need of industrial training. In spending this great sum of the people's money I know you will secure more than cul-

tural manual training and domestic science for all boys and girls, and more than preparation for an engineering training in the university for a few. I know you intend to secure to the bulk of your pupils the chances for a good, up-to-date, practical education preparatory to the dominant trades in your city. In doing this, you will stimulate your industries in giving them trained men and women. Such school and factory trained workmen will be of much higher industrial intelligence and productive capacity than the average to-day. They will demand and will earn a higher wage than is prevalent at present, and the percentage labor cost of the manufactured article will be decreased even as has been lately shown in the testimony of the United States Steel corporation before the Tariff Reform Committee in the United States. The most skilled workmen receiving a higher wage shall become greater consumers and shall be thrifty, happy, intelligent, independent citizens in whom shall be the strength of the great future Toronto. I congratulate you people on the significant step you have taken. All of us are looking for the same and speedy realization of your plans.

But I am sure that you realize that even with this large amount of money or double it, you cannot provide adequately for all the needs of industrial education in your community, as is done throughout Germany, France, Belgium, Switzerland, Ireland and some other countries abroad. The *locality* in Canada cannot be expected to bear the total expense of equipment and maintenance of a system of technical education any more or as much as in older countries. In Nova Scotia the provincial government bears the whole or part of the local evening technical schools that are now in operation throughout the province. In the newly established system of industrial schools in Massachusetts, the state bears one-half of the total expense. In foreign countries the central government bears a large portion of the expense even to one-half and more. Other examples can be mentioned, but I do not believe you need to be convinced that the Province and the Dominion should both contribute to the support of these schools.

You have, perhaps, taken up your share of the burden in Toronto, and some other enlightened and progressive manufacturing centres have done likewise, but your Province has not yet established a comprehensive system of technical education which shall, when developed, provide for these great needs that are staring us all in the face. It was only about two years ago that Nova Scotia got ahead of you for once and laid the

foundation for such a provincial system of higher and secondary industrial education as will fulfill her wants in this direction when fully worked out on the present lines.

The Dominion of Canada, to-day, gentlemen, is a world spectacle in its development. No other collection of individuals in history composed of men with such high ideals and power of achievement as the present Canadian people has ever had such a chance in such an enormous and naturally rich territory to develop into a nation with the aid of the enlightened experience of thousands of years of civilization. It is evident to right-thinking men that she should take the good that has been surely proven and adapt it unto her own needs in order to secure the rightful heritage to herself and her people. Foreign countries, especially Germany, have proven by their own acquisition of industrial eminence aside from great natural resources that technical education stimulates industries and a whole people to the utmost. Their adoption of the principle alone has made it necessary for the rest of the industrial work to also adopt it, if they would stay in the race. It ill behooves Canada to wait longer. The manufacturers of the country have shown by their recent commendable action in appropriating a large amount of money toward the expenses of a Dominion Commission on Technical Education that they will brook no more delays in moving toward a realization of such education. Members of the Canadian Clubs, who have the development of this vast nation of the Empire at heart, should inform themselves fully on this most important issue and advocate it as they see the light. It will be the salvation of Canada as an industrial country and thoroughly believe, gentlemen, that industrial education is more important to Canada to-day than tariff revision, government ownership of public utilities, railroad building, election laws, or other national questions over which Canadians weary their organs of sight, hearing and speech. God speed the day when we shall secure a National System of Technical Education.