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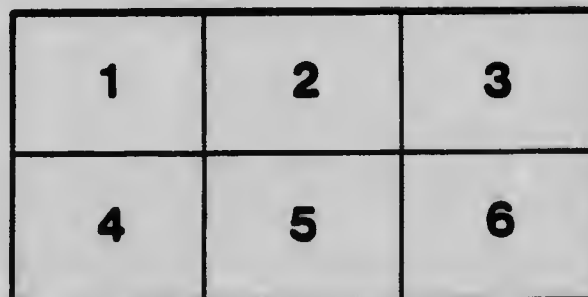
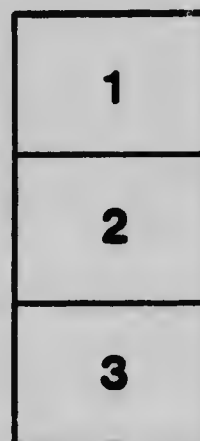
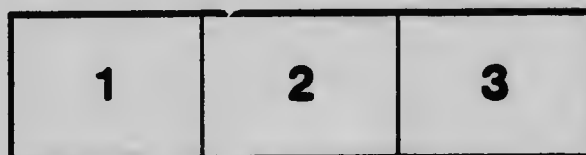
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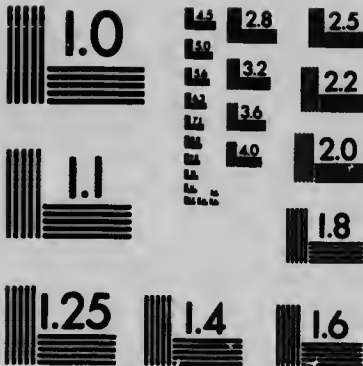
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ADDRESS

BY HON. R. HARCOURT.

DELIVERED IN THE TECHNICAL SCHOOL BUILDING, TORONTO,
DECEMBER 16TH, 1901.

I wish to thank the Committee, Mr. Chairman, for inviting me to be present this evening.

I have always taken an interest in this school, and I believe that its usefulness will become more and more apparent. There is a wide field for its work, and its power for good under wise management cannot be over-estimated. There is urgent need of such a school in every large centre in this Province.

Our Public Schools (6,020 in number, including 340 Separate Schools) and High Schools (131) are rendering magnificent service to the State. We have every reason to be justly proud of our universities and of their work; they have each their own special spheres of influence. Our three Normal Schools and our Normal College, at Hamilton, fill an important gap, and they are alike indispensable.

Our Public Libraries (we have about 450 of them in the Province) and our Art Schools have also an important place in our educational equipment.

During the last year or two attention has been directed to "Manual Training," and "Household Science," and several important centres, I am glad to say, have, in a liberal way, undertaken this valuable educational work.

Manual Training* and Domestic Science.

The Woodstock College, under the auspices of the Baptist Church, led the way and did valuable pioneer work in this direction.

The city of Brantford has a school building specially erected for it, and in Stratford a handsome building, costing nearly \$5,000, devoted solely to this work, is almost completed. The Kingston Board of Education made provision for these studies two years ago. The town of Renfrew has made an excellent start, and will, next year, have Kindergarten, Manual Training, and Household Science tuition.

We have Domestic Science classes in all our Normal Schools.

In Ottawa, Brockville and Toronto, due to the liberality and broad-mindedness of Sir Wm. Macdonald, Manual Training has been introduced. The movement fills a need and will grow.

It is well understood that these studies are not to displace other studies. Neither clashing nor displacement need follow their introduction. The day's yield of other knowledge is not lessened; it is, on the other hand, positively increased. What will certainly follow is an increased interest in the other studies, a more general desire to attend school, an appreciation on the part of the scholars of the dignity of labor, a relief from nervous strain, and freedom from what is called an excess of mere book methods. Such is the universal testimony of the highest authorities, and in support of this statement I could quote, if necessary, the opinion of college presidents and other experts of the highest standing. For example, President Elliott, of Harvard, and President Gilman, of Johns Hopkins, join in speaking most positively of the great educational value of Manual Training.

An educational expert recently said: "The great majority of scholars leave school at the age of thirteen or fourteen. What is to be the nature of their work? Chiefly the production

* "Manual Instruction" is defined "as instruction in the use of tools, processes of agriculture, and modelling in clay, wood, or other material."

of material things. Hence, since so much of their life will deal with material objects, the manipulation of these objects, the training of hand and eye in connection with them is one of the first elements of training which these children, who are to be workers, should receive."

No one, nowadays, will question the importance and desirability of studying things rather than books about things, of cultivating the hand and the eye, as well as the mind; of encouraging habits of observation and discrimination. In this connection it would not be amiss to quote Ruskin, who says:

"It would be a part of my scheme of physical education that every youth in the State—from the King's son downward—should learn to do something finely and thoroughly with his hand, so as to let him know what touch meant, and to inform him of many things beside, which no man can learn but by some severely accurate discipline in doing. Let him once learn to take a straight shaving off a plank, or draw a fine curve without faltering, or lay a brick level in its mortar, and he has learned a multitude of other matters which no lips of man could ever teach him."

And in "Sesame and Lilies," speaking in his own incomparable way to the girls of England, Ruskin says:

"Learn first thoroughly the economy of the kitchen; the good and bad qualities of every common article of food, and the simplest and best modes of their preparation. When you have time go and help in the cooking of poorer families, and show them how to make as much of everything as possible, and how to make little nice; coaxing and tempting them into tidy and pretty ways, and pleading for well-folded tablecloths, however coarse, and for a flower or two out of the garden to strew on them."

All these educational agencies—Public Schools, High Schools, Manual Training Schools and Colleges—to which I have alluded, are steadily at work, doing immeasurable good, rendering to the State incalculable service, supplying urgent needs, training the mind and forming the characters of the rising generation.

And yet there is room for other similar agencies; not room only, but a demand for them, and of these agencies for which there is a wide and inviting field of usefulness is that class of schools of which this Technical School, as far as this Province is concerned, is by far the most important.

Beginnings of Industrial Education.*

We first learn of technical or industrial education on this continent in 1640. In that year the State of Massachusetts provided for technical education, for instruction concerning the spinning of yarn, for example.

The earliest form of Manual Training Schools were spinning schools. In 1721 £300 was set apart for carrying on instruction in spinning. The then English law forbade the importation of machinery and the establishment of factories in the colonies. This was the humble beginning of industrial education in the United States. Visit almost any large city now in the United States and you will find Technical Schools or Colleges, which in point of equipment, curriculum, or teaching staff, are alike admirable.

I may well say a word about one of the most important of them, viz., the Massachusetts Institute of Technology. This College, founded in 1865, has about 1,200 students. It has 175 teachers and lecturers, and 13 distinct courses of study; there are 24 teachers, 5 of them being full professors, in chemistry alone. The *alumni* number about 2,500. It has 22 separate laboratories. The best possible provision is made for food analysis, water analysis, dyeing, bleaching, etc. In 1877 Manual Training became a part of the scheme of the Institute.

It must be remembered that Cornell University, which is in possession of invested funds to the amount of nearly \$7,000,000, is largely a Technical School, since nearly one-half of its students take technical courses.

* "Technical Instruction" is defined as "instruction in the principles of science and art applicable to industries, and in the application of special branches of science and art to specific industries or employments."

As a further indication of the magnificent and varied educational equipment provided to-day in the United States, take a glance at the Chicago English High and Manual Training School, which I visited about a year ago. In this school some 640 boys are receiving training under twenty-four teachers in Drawing and Architecture, Woodworking and Moulding, Working in Iron, etc. In addition to these studies excellent provision is made for teaching Mathematics, History, Literature and Elementary Science. The course is three years, and the age of graduation about eighteen. The entrance test is something like ours in our High Schools.

The graduates easily find remunerative employment, and not a few of them take an advanced course elsewhere.

As I have stated in an interview with some members of your Board, this type of school is specially suited, under existing conditions, to the wants of all large centres. Such a school equal to the needs of Toronto could be liberally equipped, both for working in metals as well as in wood—I am not speaking of cost of building—for less than \$30,000. No greater good fortune, in an educational way, could come to this city than the establishment of such a school in its midst. Such a school is to-day, educationally speaking, Toronto's greatest need.

There is no want of variety, then, in the educational institutions in the United States, and they are, for the most part, generously supported. Commencing with her old and time-honored colleges, such as Harvard and Yale, the process of evolution, as manifest and pronounced in the work and processes of education as elsewhere, has called into healthy existence, without any sense of rivalry, other great universities, such as Cornell, Columbia, Chicago, Johns Hopkins, some of them doing high post-graduate work, as well as broad-based technical schools such as I have been describing.

The Educational Trend.

I am attempting to show that modern conditions demand a varied educational equipment; the trend being more and more

in the direction of making provision for technical and commercial courses of study without neglecting any of the other courses.

Everyone now associates the material progress of a nation with the technical skill and knowledge of its artisans and mechanics. No people, it is now believed, no matter how rich it may be in natural resources, can maintain its place among the nations in this age of keen competition, if it neglect or ignore the question of technical education.

Germany and the United States have long since recognized the true value of such education and have made generous provision for it. England, comparatively speaking, has failed until very recent years to recognize its great importance. It seems now to be making amends rapidly; and in every possible direction. While England was indifferent, Germany was quietly training her army of skilled workmen. Her marvellous industrial progress during the last twenty-five years is, to a great extent, due to the care and zeal she had shown in educating her whole population. Her smallest villages are provided with their Technical, Trade, and Commercial Schools. Vast industrial establishments have sprung up in all directions.

She has fifty-five Commercial Schools, with 6,000 students. Important commercial houses are glad to take the graduates. In some cities, such as Vienna, travelling scholarships are awarded, and the fortunate holders of them are to be found in all the trade centres with which Austria is connected.

Every country needs these trained workers. I have spoken of one or two typical schools in the United States; let me now speak of one in Germany. The Berlin Royal Technical College has 140 professors, 260 assistants, and 3,500 students. Engineering (Marine and Mechanical), Chemistry and Metallurgy are among the subjects taught. Art galleries, museums, laboratories, all free, form part of the equipment. What we call artistic and humane studies go hand-in-hand with industrial training, whether it be trade training, technical equipment, or all-round culture—nothing is neglected. Her professors

are sent the world over to inquire, inspect and investigate, and her university men, the most learned of them, are absorbed into trades. The manufacturers of Germany have in their regular employment no fewer than 4,500 chemists.

In ten large technical schools in Germany (among them those at Berlin and Munich) there were last year 11,447 students taking a three-years' course in Chemistry, pure and applied, Physics and Mathematics. In her twenty-two universities Germany has 2,500 professors and 22,000 students.

As further proof of the thoroughness of the German system, and its all-round adaptability to the needs of every class in the community, I will say a word of the Province of Wurttemberg, which has 2,081,000 inhabitants. It supports 1 State University of world-wide fame (Tubingen); 1 Technical School (really a university); 2 Special Technical Schools (1 textile and 1 mechanical); 1 Royal Building Trades School (at Stuttgart); 3 Weaving Schools; 231 Industrial Improvement Schools; 1 fully equipped Commercial College; many Improvement Schools (18 of these for women, preparing for household management); 1 elaborate Agricultural High School. The winter instruction in agriculture is far more thoroughly organized than any similar system in the United States (not excepting Cornell).

Germany's constant and sustained devotion to the cause of sound and thorough technical education has made her both rich and great; this it is which more than any other agency has so rapidly built up her trades and manufactures, and stimulated that spirit of scientific investigation and research which has won for her scholars world-wide fame. What other country in the whole world to-day stands in greater need of the services of the chemist and the analyst, the engineer and the metallurgist, than our own Province? What other country possesses richer or more varied natural resources inviting immediate development? Should we not, then, place easily within the reach of our young men the technical training they so greatly need?

Those who have studied the German schools invariably give them the credit for much of her great commercial success. Even in England, where the people are so conservative and so slow to change, men of the very highest prominence are asserting that more attention must be given to the teaching of those sciences which are capable of application to manufactures and industries; that technical education is extremely valuable because of its connection with the production of goods, and commercial education likewise, because of its connection with the distribution of goods.

Marked Industrial Changes.

Great and surprising commercial and industrial changes have come to pass during recent years. For example, American rails have been sent to India; Philadelphia bridge-builders have been at work in Egypt; railway coaches have been sent from Jersey City to the land of the Pharaohs; electrical tramways made in the foundries of Pittsburg now connect Cairo with the Pyramids; England is buying American locomotives, steel rails, paperware, railway coaches, and even coal; Pittsburg is no mean rival of Sheffield; Switzerland, without seaboard or coal, competes valiantly with Nottingham and Leicester. Two millions of people now earn their living in connection with electrical appliances.

In one large manufacturing plant near Mannheim 150 expert chemists are employed, and nearly all of them hold the degree of Doctor of Philosophy, obtained at some German university. This one establishment sends to the United States \$20,000 of its product every week.

The value of the German export trade in scientific instruments in 1898 was \$3,566,000. They were made in 790 establishments, employing 13,625 employees, and this was the result of subsidizing physical and chemical laboratories, observatories, and experimental institutions of all kinds. Not long ago England and France monopolized this trade.

In the matter of aniline dyes England formerly had things

her own way. Germany, thanks to her chemists and the schools in which they were trained, now enjoys a very lucrative trade. The wonderful advance of Germany in the development of her ship-building industry and the success of her chemists in the production of artificially prepared indigo furnish other striking examples.

The manufacture of steel in the United States twenty years ago was in its infancy ; now it exports steel products to England, and excels in making tools, sewing machines, agricultural implements, etc.

Formerly soda was obtained only from vegetable ashes. Now artificial soda is the object of commerce amounting to many millions. The progress of chemistry has brought about the change.

England's Commercial Future.

HER TECHNICAL SCHOOLS.

And yet no one has doubts as to the commercial future of England. She must continue to pay her ever-increasing food bill with the product of her mills. She has still the lion's share (more than one-half the world's trade), in the matter of exports of machinery and implements. She has still in her hands some of the great staple industries such as cotton goods and hosiery.

The amazing material development of Germany and the United States has attracted the attention of England to their system of technical education, which furnishes equipment to their producers. Of the one hundred Scientific and Technical Schools of the United States, nearly all have sprung into existence within a very recent period. Mr. Carnegie is now making provision for a Technical School at Pittsburg, and is setting aside for the purpose \$1,000,000. A Commercial High School—the first on the continent—was opened only the other day in New York City, the tuition being free.

Ten or twelve years ago no public money was spent in Eng-

land for technical education. She has now nearly three hundred such schools. Indeed, every county in England has now a Technical Board and receives a grant. Five or six millions of dollars a year is given for this purpose, and in addition the municipalities give considerable grants.

Even Oxford University gives a degree of Bachelor of Science. A School of Science, Technology and Art has been established at Liverpool with four thousand students. In the other large centres in England the same educational trend is manifest. A similar process of evolution is clearly apparent in France.

London University is now devoting itself largely to the scientific and technical side of educational work.

Lord Rosebery has been advocating the immediate addition of a commercial faculty at Glasgow University, of which he is the rector.

The Duke of Devonshire recently said: "Foreign nations have anticipated us to a very great extent in realizing the close connection which exists between educational and industrial and commercial success. This is a fact which is being brought home to us almost daily in various directions of the increasing competitions to which we find ourselves in every quarter exposed. The urgency of the question is coming to be recognized by practical men of business."

A partner of one of the foremost steel companies in England, in speaking to Mr. Carnegie, said: "It is not your wonderful machinery, nor even your unequalled supplies of minerals, which we have most cause to envy; it is something worth both of these combined, viz., the class of scientific experts you have to manage every department of your works. We have no corresponding class in England."

Our Needs, Our Duty.

We must look to the schools, of course, to give us the scientific experts. We need scientific education for utilizing, to the best advantage, all our resources, alike of forest, farm and

mine. Nowhere than on our fertile farms can better use be made of the learning of the chemist and biologist. The by-products alone of our forests represent untold wealth.

Having all this in view, we incorporated last session in the Act Concerning the University of Toronto, the following provisions :

O. S. 1901, Chap. 41, Sec. 16, Sub-sec. 1.

“ For the purpose of encouraging the study of the mineral and other natural resources of the Province, and for supplying the demand for expert knowledge in engineering and manufactures, the Lieutenant-Governor may from year to year pay out of the consolidated revenue of the Province the salaries of all professors, lecturers and other instructors in the departments of Chemistry, Physics, Mineralogy and Geology, and the cost of maintenance of said departments, such payment to be based upon the annual estimates of the trustees as approved by the Lieutenant-Governor in Council. The first payment under this Act shall apply to the financial year of the University which closes on the 30th June, 1901.”

These provisions will greatly strengthen the teaching of the University in these very important subjects.

The School of Practical Science has rendered great service to the Province, and has grown in usefulness year by year. We are about to erect a large building to meet its growing requirements.

It would be an easy task to furnish further illustrations of the fact that modern commercial conditions call for the establishment of Technical Schools and Colleges. The experience of the most enlightened countries points all one way. Switzerland and Belgium might be cited, if it were necessary.

Educational Evolution—Changes Necessary.

Education is a phase of life ever changing and never staying long in one place. Its changes are not due to the whims of teachers, or the choice of professors. Inventions, discoveries,

altered surroundings and conditions exert their influence. Every step forward is a response to some real need. The telegraph and telephone, the railway, the museum, the library, and the art gallery, cheap books and magazines—all these have tendered to change completely our intellectual environments. In no age or country will anything even approaching permanency, finality or perfection be reached in the matter of education. There is unrest and great conflict of opinion, everywhere the world over, concerning school systems, courses of study and educational problems generally. It is apparent to everyone that during recent years, owing to keen commercial competition, these problems have greatly increased both in number and in intricacy. Moreover, not a few of them present conditions completely novel.

Germany, France, England and the United States, not to speak of other countries, are now giving marked attention and emphasis to commercial and technical education.

What is *our* duty in the matter ?

No one of these countries possesses greater natural advantages than our own Province. Prussia is far inferior to Ontario in this regard. The industrial growth of Germany has been prodigious in spite of unfavorable skies and poor soil. We unquestionably possess in inexhaustible abundance all those natural products which underlie a nation's greatness. The potential wealth of our farms, mines, and forests is simply incalculable. We must make the most of our resources, and to this end, as has been the case elsewhere, we must provide technical training for our engineers, chemists, metallurgists, analysts, and all other captains of industry.

Over and above our existing equipment for commercial and scientific training, we need in all our centres of population Technical Schools furnishing systematized, sustained and continuous teaching. Such schools would do untold good. I believe that there is a sincere desire on the part of your Board to strengthen this school. The University Extension Movement in England and elsewhere, has led to most important results, and has become a powerful educational factor.

Those who have studied it state that its success or failure in this or that town or centre depends largely on the lecturer himself, on his teaching power, his power to evoke enthusiasm and to stimulate a desire for knowledge. Your success in a like way will depend on your staff of teachers, their fitness and zeal, and especially on the head of the staff, the principal whom you may select.

The Financial Aspect—Duty of the Government at Ottawa.

I would be glad to see in Toronto a non-classical High School with accommodation for 200 scholars and systematized, thorough teaching in scientific and commercial courses. There is room for such a school. The last three years has given ample proof that to prepare adequately for war a nation needs not men only, but unlimited money as well. Our schools are in the same position and they need efficient teachers and strong financial support.

This Province has not stinted our schools. We believe that the money spent on them is a good investment and comes back, as a great German has said, in the manhood of a nation.

We are spending this year for this purpose nearly \$800,000, a fifth of our total revenue; and this does not include our grants to the university.

Without seeking to exalt one phase of scholarship at the expense of another, the Government is anxious to further technical education, and we mean to do so to the full measure of our ability. We must at the same time keep in mind the ever-increasing demands of our Public Schools and the expanding educational needs of the newer parts of our Province. This will entail in the years to come a considerably increased expenditure. The United States Congress gave last year \$9,000,000 for scientific education. Should not the Federal Government at Ottawa, in a like spirit, undertake this work, rather than our Government, or at any rate, should it not share in the work? The grant of Congress represents twelve cents

per head of the population of the United States. A similar grant from the Ottawa Government ear-marked for scientific, technical and commercial teaching would yield say \$600,000, to be divided amongst the provinces, and Ontario's per capita share would, roughly speaking, be \$360,000. Could any money be better spent? Even a much less amount could be spent to great advantage. The Technical Education Fund in England is apportioned to the school districts according to their population.

With such a grant at our disposal, every city in Ontario would be in a position to give excellent technical and commercial training, and thousands of our boys would be thoroughly trained for active business, as German boys are; would become captains of industry, strong and able to wrest wealth from Nature, and take a foremost part in that which is to be our keenest struggle for years to come, viz., the task of utilizing our immense latent resources. Schools thus founded would keep our boys within the country, and they would be able to take many positions now filled by foreigners.

In Germany Technical Schools are assigned to the Department of the Minister of Commerce and not to that of the Minister of Education. That fact alone is very suggestive. And in England, also, agriculture and technical instruction are joined in one Department. It will be remembered that Mr. Horace Plunkett, late member for Galway, is its Vice-President.

Our able Minister of Finance at Ottawa would be the first to admit the close connection between technical training and the trade and commerce of the country. The Government at Ottawa long since recognized the principle, and I am only asking to have it extended.

It aids experimental farms, and maintains a Military College, in each of which the training is scientific and technical. Why not aid a Technical High School as well as a Military College? Both are deserving and worthy of every encouragement.

If the grant were given, which I suggest, Manitoba could apply its share to the maintenance of an Agricultural College

such as ours at Guelph, and British Columbia would, perhaps, erect and equip a School of Mines.

If the City Councils and Boards of Trade of the Provinces were to take this matter up I cannot believe that any Government would refuse the request.

The provinces have limited, narrowly prescribed sources of revenue, and primary education of itself makes great demands on them. The Dominion Government should undertake the work of technical education, and is abundantly able to do it.

A specially attractive feature, Mr. Chairman, of schools such as this is the regular attendance of considerable numbers of adults, men and women, taking special courses. The fact of their so doing is a proof of their industry, desire for self-improvement, and an ambition to do good work. To them I would address the eloquent words of Dr. Creighton, Lord Bishop of London :

“The point at which knowledge will cease to make a man a better wage-earner may soon be reached ; but the point at which it will cease to make him a better man and a happier man will never be reached. And to find perpetual sources of new interest in one’s daily work, to feel a constantly increasing demand on one’s intelligence and a growing development of one’s powers of observation,—this is of incalculable advantage to the progress of industrial life.”

