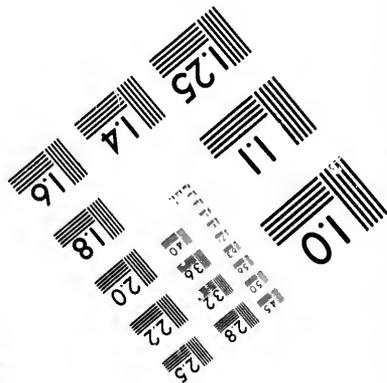
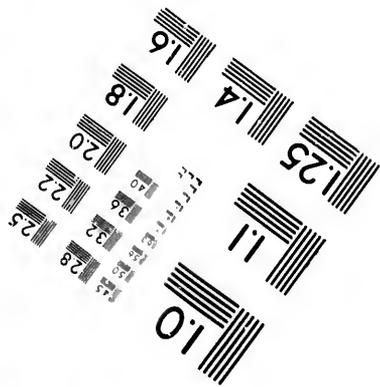
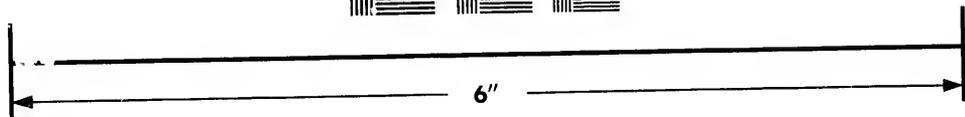
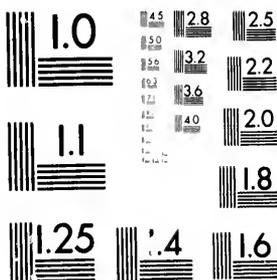


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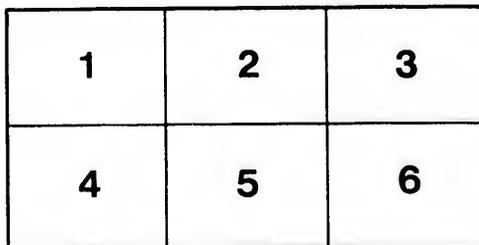
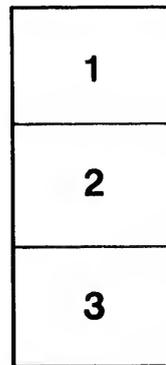
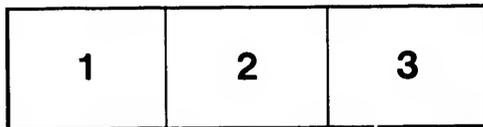
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Toronto, Board of Trade - Special Committee
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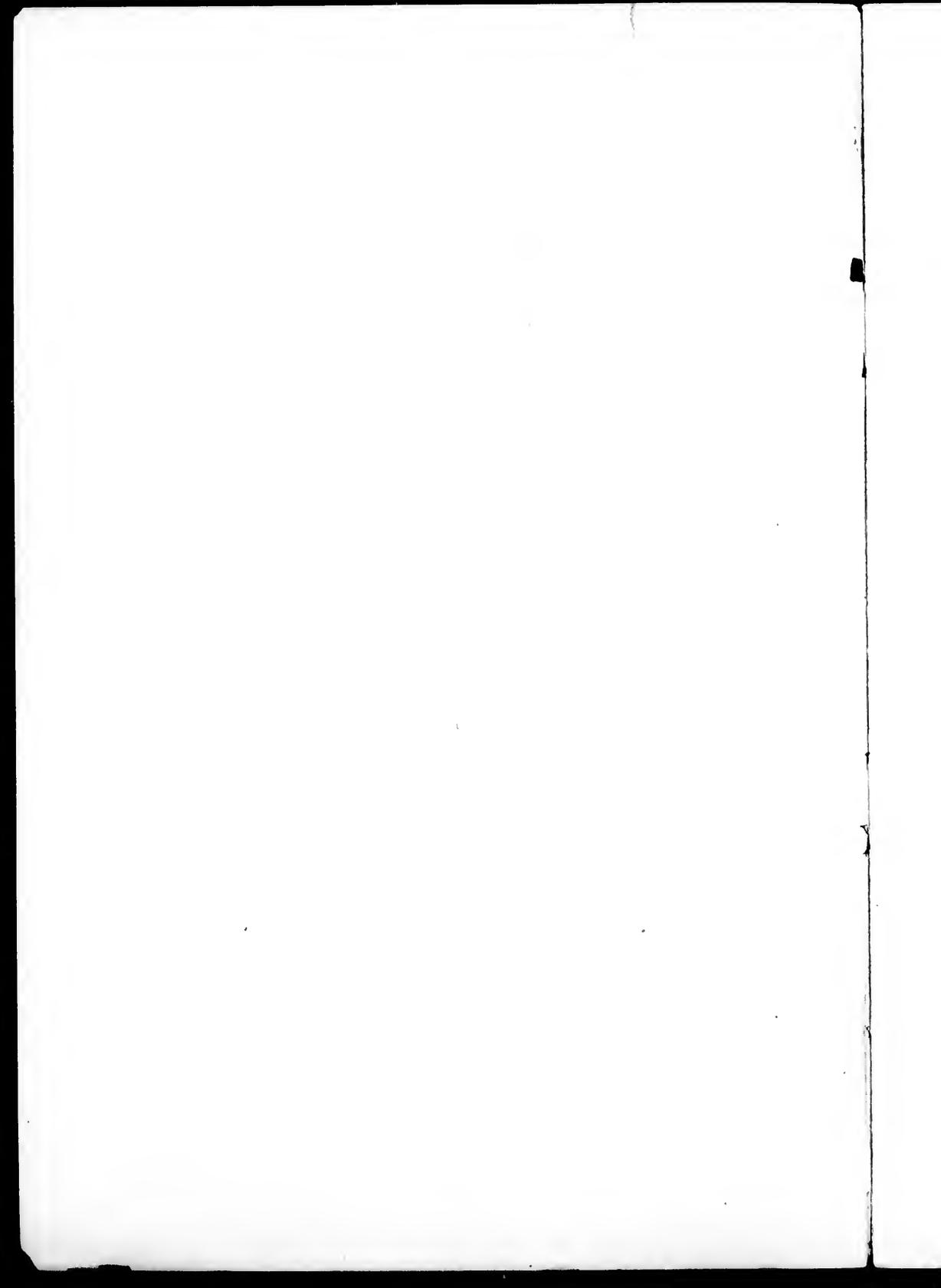
REPORT
OF THE
COUNCIL OF THE BOARD OF TRADE
RE
TECHNICAL EDUCATION;
ALSO AN
ADDRESS
BY
MR. JAS. D. ALLAN,
Chairman of the Committee of the Council re Technical Education.
SUBJECT:
Technical Education from a Business Standpoint

DECEMBER 8th, 1899.



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REPORT OF SPECIAL COMMITTEE

RE

Technical Education.

To the President and Members of the Council :

GENTLEMEN :

Civilized communities throughout the world are massing themselves together, each mass being measured by its force, and if we are to hold our position amongst men of our race or amongst the nations of the world we must make up the smallness of our numbers by increasing the intellectual force of the individual.

Unless we intend the Canadian people to become hewers of wood and drawers of water for the world we must make them as well prepared for the work they have to do as are foreign workmen.

An excellent system of public education is one of the best forms of national investment.

In commercial and industrial efficiency, in a higher level of civic duty, and a wider diffusion of moral culture and religious feeling, the nation is amply repaid for its expenditure.

The question of Technical Education has at last assumed a position of great prominence, and is commanding special attention in every country, and conferences are being held to consider means and methods of making this a leading feature. In Ontario all are probably agreed that our system of elementary education is admirable, but higher education has been worked out too much on a theoretical plan, and has graduated many whose power of applying the results of their academic course has resulted in leaving too many helplessly equipped for the battle of life. To remedy this we seek to utilize our present system as far as possible by correcting its weakness, lopping off the useless branches, and grafting new shoots productive of vital results, in the ever-changing condition of manufacturing and commercial development.

Trade has two specific sides—production and distribution : The former concerns every manufacturer, agriculturist, miner, and miller ; the latter is the province of the merchant. The one without the other is helpless, and a system of education that includes the one and omits the other is defective, and yet the immense sums

spent on education in Ontario has very slightly minimized this defect, because of the apathy of the people in taking advantage of existing legislation empowering them to introduce in some degree technical training.

Does our present system emphasize the importance of training a youth for commerce? We take this first because of the prevailing impression that we require no progress in this line. In reality right commercial training is a branch of Technical Education, if we believe that the distribution of commodities is as important as their production, and requires a special course of training just as much as the other. If we are to meet effectually the commercial competition of other countries we must have trained merchants as well as skilled mechanics. No country has shown a more striking instance of this than Germany, the aggressiveness of whose merchants in the distribution of the products of the skilled industrial army (created in 25 years by their combined system of technical education and commercial education), with equal success free trade Britain, as in high tariff America, and in being able to wrest from her competitors some of their principal markets, is distinctly traceable to the advantage of a specialized training of her population. If this be acknowledged would it not be well to study her methods, and adopt any features that can be grafted upon our own system that will make us more effective in production and distribution? The Commercial High Schools that train men for mercantile careers, teach history, geography, chemistry, modern languages, mathematics, book-keeping, commercial law, political economy. The Consular Report says: "The school neither aims nor hopes to replace actual experience, but it does aim and it does hope to build the boy up and out in such a manner as to enable him to use his eyes, ears and faculties in acquiring knowledge rapidly, to exercise good judgment and tact, to give satisfaction, and to go climbing upwards."

There are Technical Schools of various grades for almost every industry—weaving, knitting, soap-making, building, clock-making, brewing, tanning, dyeing, farming, plumbing, navigation, marine engineering.

The United States Consul reports: "If an industry languishes in Germany, immediately a commission enquires into the causes, and recommends remedial measures, among which is usually the advice to establish Technical or Industrial Schools devoted to the branch of business under consideration."

In discussing what system we shall adopt in Ontario we will assume a good elementary education as a basis; having obtained this, 14 years to be the age of applicants, candidates to elect whether the commercial or industrial course.

- (1) That Technical Education in order to be thoroughly successful should be part of the foundation of our general educational system, and elementary technology should

be as speedily introduced into all forms of the Public Schools in the Province as time and circumstances will permit. The technical subjects taught must vary according to the special locality, with due regard to the manufacturing industries to be benefited.

- (2) Both day and night classes should be held in these schools.
- (3) It is necessary that pupils should have a good elementary education, and therefore a fixed standard of education is essential before these pupils be admitted to the school.
- (4) The government of the school should be by a Board of Trustees, appointed as follows :

From the

Board of Trade	-	-	3
Minister of Education	-	-	3
Municipal Council	-	-	3

- (5) The subjects taught in the Technical Department should include the following, and the teaching should be as practical as possible, have due regard to the particular trades common to the municipality in which the school is located : Strength of Materials, Building Construction, including Heating, Ventilation, Plumbing, Drainage. Physics, which should include Heat, Light, Sound, Chemistry, Electricity and Magnetism. Machine Construction and Design, Mechanics, practical and applied, Steam and the Steam Engine.

Chemistry.

Textile Fabrics, Dyeing and the Art of Coloring, Tanning and Dressing of Skins, Mixing of Cement and Mortars. Mineralogy and Metallurgy, Assaying, etc. Geology, Mathematics, including Euclid, Trigonometry, Algebra.

Regular Art Course.

Antique, Freehand and Perspective, Sketching, Color, Anatomy, Life Portrait, Composition, History of Art, China Painting.

Design.

Freehand Drawing, Ornaments, Color, History of Art, Composition, Decorative and applied Design, Technical Methods.

Clay Modeling and Wood Carving.

Ornament, Antique, Design in the Round, Modeling from Life, History of Art, Freehand and Instrumental Drawing.

Architecture.

Freehand and Instrumental Drawing, Color, History of Architecture, Theory and Practice of Architecture.

- (7) Domestic Science should embrace the following subjects :
Cookery, Dress-making, Plain Sewing, Fancy Needlework,
Physical Culture.
- (8) A Commercial Course should embrace the following subjects :

Commerce and Book-Keeping.

Under this heading should be included Purchases and Sales, Documents relating to same, Modes of Effecting Payment, Means of Transport, Customs and Excise, Bonded Warehouses, Banking, Exchange, Insurance, Syndicates, General idea of Trade and Industry, Mental Arithmetic, Interest, Discount and Commissions, Current Accounts, Various Systems of Weights, Measures and Coinage, Division and Classification of Accounts, Operations at Exchanges, Selling Out, Quotations, Drafts, Balancing of Accounts, Inventories and Balance Sheets, Organization of Accounts, Commercial Accounts, Industrial Accounts.

Modern Languages.

English, French, German and Spanish.

Commercial Arithmetic.

Calculations relating to Simple Interest, Discount, Precious Metals and Monetary Systems, Stocks, Exchange Operations, Exchange, Compound Interest, Industrial Stock, Issuing of Stock by large Banking Establishments, Operations of Insurance Companies.

Study of Merchandise.

Including Precious Stones, Combustibles, Chemical Products, Vegetable and Animal Products used in Industries, Building Materials, Metals, Vegetable Products of Medicinal Value, Mineral Products, Animal Products and Vegetable Products.

Commercial Geography.

Considering each country in the light of its Geographical Configuration, Population, Languages, Political Institutions, Climate, Agricultural Products, Mineral Wealth, Manufactures, Industrial Centres, Means of Communication, Foreign Trade, Imports and Exports, Customs Administration, Commercial Treaties, National Customs and Character.

Study of Means of Transport.

Establishment, Maintenance and Administration of Means of Communication, Special Study of Railway Tariffs.

Commercial Law.

Including General Summary, Documents, Merchants, Companies, Intermediaries employed by Merchants, Sales, Transport Contracts, Notes and Bills of Exchange, Banking Transactions, Bankruptcy.

Maritime Law.

Vessels, Freight and Charter Parties, Marine Insurance.

Industrial Law.

Patents, Models and Designs, Trade Marks, Unfair Competition, Dangerous Industries.

History of Commerce.

Tracing the origin and development of Trade through the world from the earliest times.

Political Economy.

Production, Interchange of Commodities, Division of Property, Consumption, Population, Civic Government.

Fiscal and Customs Legislation.

Commercial Statistics, Commercial Policy and Customs, Tariffs of Principal Countries.

Commercial Apparatus.

Elementary Notions of Mechanics, Telegraphy, Telephony, Electric Light, Electricity as a Motive Power, Railways, Internal Water Ways, Seaports, Warehouses' Correspondency, Composition, Penmanship, Stenography and Type-writing.

All of which is respectfully submitted,

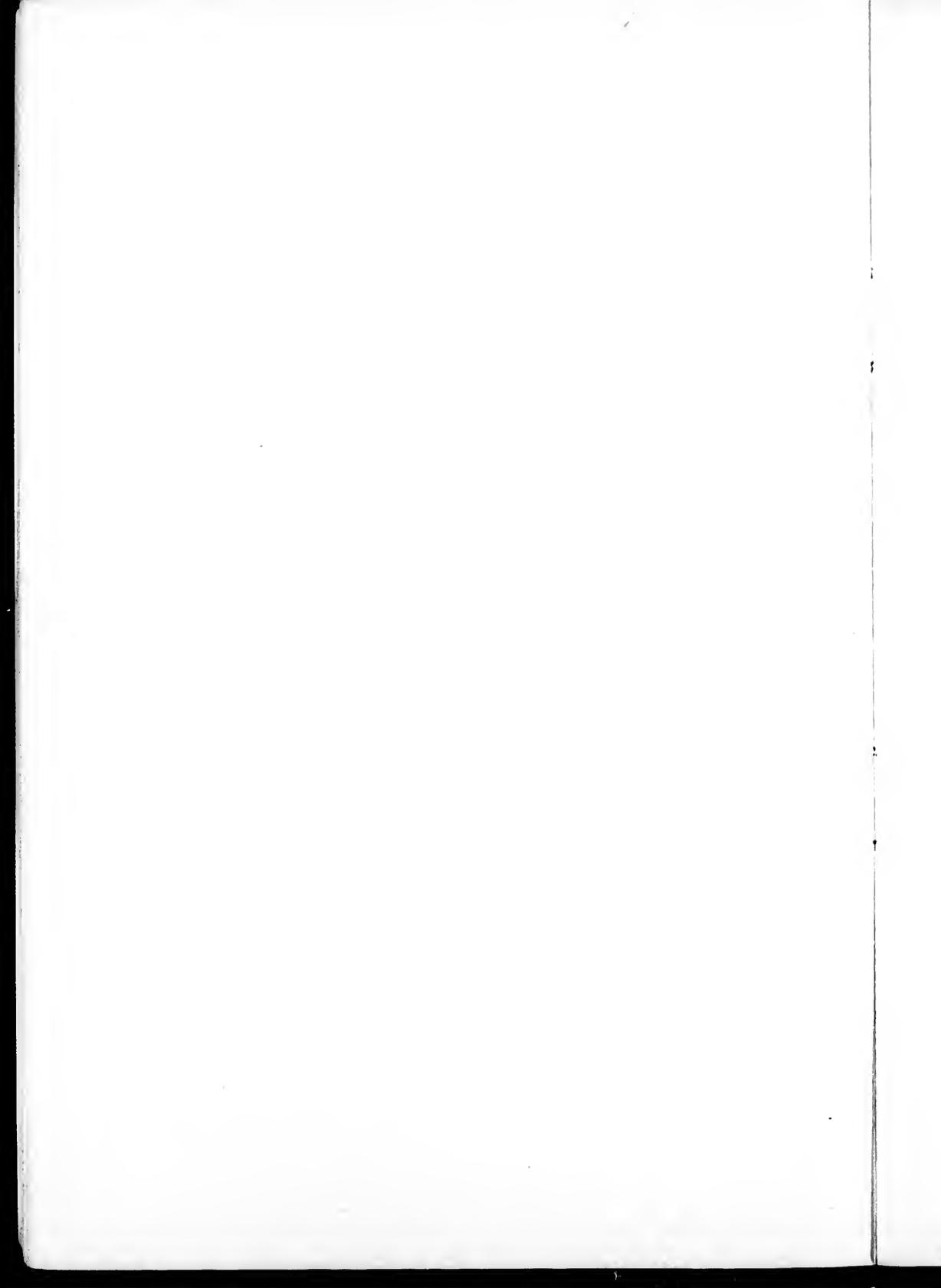
(Sgd.) JAS. D. ALLAN, *Chairman.*

Adopted August 10th, 1899.

EXCERPT FROM MINUTES OF COUNCIL MEETING,
DECEMBER 7, 1899.

Resolved, That the Report of the Committee re Technical Education, as now submitted, be approved and adopted, and that the same be printed, together with an address recently delivered by Mr. Jas D. Allan, Chairman of the Committee, and copies of same furnished the members of the Board.

EDGAR A. WILLS, *Secretary.*



TECHNICAL EDUCATION

FROM A BUSINESS STANDPOINT.

No Government by its action can control the industrial enterprises of nations.

The question of individual force is that which is inherent in a people, and for this no substitute can be found, and if the people of older lands are numerically greater than we are, it behooves us to increase the force of the individual by a system of training and culture that will atone for the smallness of our numbers by increasing the force of the unit. How this can be most efficiently done is a problem that is exciting universal attention, and while no solution has yet been presented, it is very generally agreed that some change in our educational system is necessary to produce the desired result. The aim of our educational system, as at present constituted, has not been to turn out good, all-round men, for tradesmen or merchants, but rather to follow out a classical course, with the inevitable result of over-crowding the so-called learned professions. I believe it to be the duty of every nation to give every citizen an education that will not only make him a better citizen, but will assist him to achieve the highest possible success, and in these days of keen competition the citizen must be equipped for life by having been trained to some method that will have a direct bearing on problems that will meet him in life's battle. We need leaders as fully trained for the factory, for the counting-house, for the business rotunda, as for the academical chair.

Education should comprehend two principles—Culture and Capability. The first is the approach, mentally and morally, to the ideal man; the last should mean the power of performing the highest possible service. Has this always been realized as the aim of our present system? I think not. I myself can remember when in this Canada of ours education was largely a caste distinction and intended only for the wealthy. This was before the establishment of our system of free schools, and the true dignity of human labor was not then recognized; but better days have dawned, and now the more widely the distribution of the product of labor the more inspiring to the operative is the thought that the result of his skill in design and completion is destined to awaken in some unknown recipient a thrill of pleasure as the reward of his activities. A system of education cannot be built up in a few years, nor can any system successful elsewhere be adopted in its entirety.

It would be folly for us to close our eyes to the increasing keenness of competition, or offer excuses for being unable to compete with the products of some other countries, aided by high tariffs to cover the difference between our economic conditions and the countries with whom we compete. If that competition is to be successfully met it can only be by giving our youth the same scientific and technical education as is furnished to those who are our competitors. Let us instance Germany as a notable example whose industrial expansion is distinctly traceable to the technical education of its population. The distinguishing feature of this education is its *specialization*, with the attendant thoroughness which accrues to those who patiently strive for the accomplishment of a definite aim. With this object steadily before him the student is fitted for his life's task with the best possible mental and manual instruction that can be given him. Specialization lies at the base of the German Industrial System, and recruits for the industrial army are being trained in their schools, and are sure to attain to a higher degree of technical skill, that will secure a greater productive efficiency, and thus as time goes on she will grow stronger and more formidable.

My first visit to Germany was made shortly after the Federation of the Empire, when commercially she was weak, almost unknown as a factor in the commerce of the world. I have seen her cities grow with a rapidity that rivals the growth of our western cities. I have seen her manufacturing centres expand and her export trade increase till she has measured swords with Britain for the markets of Asia, Africa, South America, Australia and the islands of the sea. Annually has she grown more prosperous in doing what her competitors have styled "trade at ruinous prices," and this success is directly traceable to the splendid system of technical education. The growth of her exports is steady and continuous, and daily she grows more powerful. Do we realize what this means for the future of our Empire? Are we to fall behind in the race for the world's commerce, and that flag beloved of all of British blood to take second place in commerce? My Anglo-Saxon pride scouts the very possibility of such a contingency. Should we not earnestly study her methods and adopt any features of her system that will make us more effective in production?

For a long time the theory that Germany owed her expansion to cheap labor was generally accepted, but the report of the Commission of the British Iron Trade Association in 1895 did much to dispel that. This Commission included representative manufacturers of iron and steel in Great Britain, and the delegates from the various classes of metal workers on their return from their visit of inspection reported that German success was due to superiority in skill and technical training. The superintendents, the foreman, and even the heads of the gangs of laborers, were men who had been prepared for their special tasks in scientific schools.

What is true in steel and iron industries is true also in the textile industries. In 1880 Germany imported from the United States 452,287 bales of raw cotton; in 1892, 1,544,841 bales; in 1895, 2,310,284 bales, manufacturing it into every class of cotton goods to export into the markets of the world, which not so long ago were almost entirely in the control of Great Britain, and that this expansion is not confined to any special lines, but is made up of all kinds of manufactured goods is proven by the figures for 1898. The value of the imports rose from \$1,159,060,000 in 1897 to \$1,296,148,000 in 1898; the exports from \$901,547,000 in 1897, to \$962,380,000 in 1898.

Do we realize in this land how rapid German expansion has been? I fear not. Sometimes I fear that, having measured ourselves by ourselves, we have concluded we are the greatest people on earth, and are not looking for any evidence to dispel the delusion. I will give a few statistics of the growth of German cities, from 1875 to 1895, that will furnish food for thought.

	1875.	1895.	Increase per cent.
Berlin.....	830,000	1,680,000	102
Hamburg.....	240,000	630,000	162
Munich.....	170,000	410,000	140
Leipzig.....	110,000	400,000	263
Fifty-six other Cities.....	3,320,000	6,060,000	80
	4,670,000	9,180,000	96
	1875.	1895.	Increase per cent.

In the same time the rural population increased from.....38,060,000 to 43,070,000 or 13

The working power of the Empire has grown 80 per cent., or about four times as fast as population. At the present the working power is equal to 900 foot-tons daily per inhabitant, as compared with 600 foot-tons in 1875, so that two men can now do as much work as three could do twenty years ago.

In textile manufactures the weight of fibre consumed has been more than doubled in twenty years. Germany consumes annually 30,000 tons more fibre than France, while as to Britain, the consumption is as 3 to 7, and nearly all the fibre is imported. In cotton she has distanced all continental countries, and has at present 4,700,000 spindles employed. Production in the textile industries increased 110 per cent. between 1875 and 1895. As a producer of steel in the same period, the annual output rose from 35,000 tons to 2,500,000 tons.

In the manufacture of hardware she stands compared with Great Britain as 3 to 4. The increase of wealth is the natural result of this marvellous development of industry, which can be ascribed in a great measure to the advanced system of instruction among all classes of the people, and in every state and kingdom composing the Empire.

I need not waste time in recounting the marvellous growth of German commerce, which has challenged the admiration of all students of economic science, but I will proceed to notice the system of education that has admittedly been the cause of such marvellous results. An excellent system of public education is one of the best forms of National investment. The truth of this has been amply proven in the case of Germany. Thirty years ago the idea of taking from her any practical lessons in the manufacture and distribution of products would have been scouted; to-day her achievements in applied science, and the wonderful growth of her export trade has set all countries studying her methods. Her system of education is practical, and is constantly being improved along the lines of any recent developments or discoveries that have a bearing on the future usefulness of the scholar.

The Elementary Schools, called *Volkeschulen*, are the training places for all children between the ages of six and fourteen years. Attendance is made compulsory. These schools are the root of the educational system. Next in order are the *Gymnasium*, which are really the classical schools, and lead up through a strictly classical course to the University in one direction if a learned profession be the goal of the student's ambition, or another development of the system leads from the *Volkeschulen* to the *Realschulen*, in which the exact sciences rather than Greek and Latin are taught, and these lead into the Technical High Schools, or Polytechnic Schools, of which there are nine of the highest class in Germany. These enjoy the direct patronage of the state in which they are situated, and are assisted in their maintenance by the ruler of said state. The one at Berlin is under the King of Prussia; at Dresden, the King of Saxony; at Stuttgart, the King of Wurtemberg; at Karlsruhe, the Grand Duke of Baden. These are great institutions for the teaching of applied science, always with some practical end in view. Architects, engineers, chemists, metallurgists and technical experts of the highest grade are prepared in these schools. There are in Germany schools working toward special technical ends, which have a similar rank with the Polytechnic, notably the schools of Mining, one at Freiberg in the Saxon mining district, another at Clausthal, in the Harz mountains, among the lead, copper and silver mines. These mines, though now very deep, are worked at a profit owing to the application of strictly scientific principles. The Government works the mines largely to furnish an object lesson to the students. Mills and smelting furnaces are in active operation at the mouth of the shafts. Some of the professors rank among the greatest mining technologists of the world, and to the influence of these schools is traceable the reputation as metal-workers the Germans have already won.

There are manual training schools and technical schools of different grades for almost every industry—for brewing, tanning,

dyeing, plumbing, soap-making, clock-making, knitting, weaving, and in sea-ports for teaching navigation and marine engineering.

The shipyards of Bremen, Hamburg, Kiel and Stettin are dangerous rivals to the shipyards of the Clyde, Belfast, and the Tyne.

A few years ago the tanning industry seemed to be on the decline. A tanning school was at once established; a corps of chemists directed the work of preparing the skins, and succeeded in regaining the position formerly held by them in this business. When the mechanics who had earned a livelihood by carving cuckoo clocks found their occupation gone because of the introduction of machinery, a school for clock-making was established, and soon again were they able to compete with the world. If an industry languishes, immediately a commission inquires into the cause, and recommends remedial measures, and in many cases the remedy is to establish technical schools devoted to the branch of business affected.

There is no industry to which greater attention has been given than to the production of artificial dye stuffs, and in these the greatest success has been achieved, natural products having been displaced by extracting from tar a cleaner, cheaper and more easily handled dyeing material. What was once the product of madder, indigo, dyewoods, insects and mollusks is now made from coal tar, and the colors produced quite as beautiful.

They are still working to produce a substitute for indigo for which \$5,000,000 annually is paid by the empire. In no land is scientific chemistry so generally cultivated, and in none have manufacturers been so ready to adopt results of chemical research. Hermesdorf, the greatest dyer of blacks in the world, secured his fame by placing chemists beside his practical dyers. Energy, intelligent effort, scientific analysis were the secrets of his success, and these, I believe, are not alone the special property of Germany. When I think of the success that has attended German efforts in all these lines, do you wonder that I am anxious to urge our Canadian people to adopt means for the creation of our raw materials (infinitely more varied than is possessed by Germany), into manufactured product, and to make valuable the product of what is now largely waste material, and I believe it is possible to produce valuable manufactured articles in this way cheaper than the raw material, for such articles can be procured in some other lands. I have seen special ovens used in Germany for burning coke from which gas, tar and benzoli could be collected, and these worked into chemicals. Nothing is allowed to waste, and thus is the cost of production reduced. In every industry technical and scientific men are employed. I know of one dye works for the manufacture of dyeing products that employs 100 chemists with university education, and 25 engineers with a technical education. In the case

of the chemists no striking results are expected for a year or two after their appointment. They devote themselves to the special task allotted them, and in time fully justify their appointment. Nowhere else has the gap between the educational system of the country and the practical interests of commerce been bridged in so effective a way.

From conspicuous examples of the prizes and positions that are within his grasp, if diligence, application and hard work be accepted as the conditions of winning, the German student enters upon his work with a different spirit from many students on this side, whose idea of fame often consists in his desire to be champion in all athletic contests, and the work of the German student is aided by the display of a similar spirit to his own. When it is desired to start a school the funds available are not invested in expensive buildings, but instead any large building with good walls and sufficient space is pressed into service, and the real expenditure is unstinted in the employment of teachers full of the spirit of research and demonstration, whose zeal has been increased by constant investigation, rendering them fully capable of inspiring others with the same zeal. To these men no saving of any sum in salary necessary to secure them is considered, and this should, I think, be our policy. The school is not the building. It is the staff who teach, and the spirit communicated, and the ambition awakened that influences the intellectual and scientific life of our country; the value of this cannot be measured by dollars and cents. I trust we will not commit the folly of erecting magnificent buildings first, at a probable cost of, no cautious man dare hazard a guess how much; if done in the same prudent, economical, business-like manner that has characterized the erection of some other edifices, the scheme would be crippled, the usefulness of the school impaired, and a stunning blow be given to the success of the school that a generation could not repair. I would endow brains instead of bricks, and secure as teachers men who can lead the students to new intellectual levels, and increase their regard for the truth in acquiring practical knowledge based on human experience.

Having now hastily given you a cursory glance at what has been accomplished in Germany, I will summon courage sufficient to outline what from the standpoint of a merchant should be done in Canada. I maintain that production and distribution are the two specific sides of trade. If distribution be weak, production will be retarded. If technical education be necessary to the mechanic, it is equally so to the merchant. Assuming that there will be no difference of opinion on this point, we will first discuss what can be done to make production more effective. It is characteristic of the Germans that they prepare a long way ahead; they are not impulsive reformers, but proceed systematically upon the bases of what exists, changing it as conditions of life demand. In this way I would introduce elementary technology into all forms of

public schools in the province at as early a date as possible. Perhaps a definition of elementary technology, as I understand it, will be helpful. It means the working of the hand and brain together. In our present system we really begin this with our youngest children in the kindergarten, interesting them in hand work as a cultivation of the brain, and when we have trained them to a point where the brain is able to grasp facts by the training of the senses, it is dropped from the school curriculum. Is it reasonable that in the first terms at school children should be taught to draw, design, build, model, weave, also to grasp the idea of size, weight, color, form, and having thus been grounded in the first principles of technology they are continued no longer in the course, instead of developing in them a taste for some particular line by a continuance in the exercise of the boy's mind, hands, arms and tongue in such a manner as to acquire knowledge rapidly, to exercise judgment and tact. The practical work should be made to conform to work in actual life.

Manual training, which is the education of all the faculties and not the training of any special group, not the purpose to produce mechanics more than any other class of specialists. It is a system of education perfectly general in its character, and surrounds boys with the realities of life in both thoughts and things, is an important factor in technical education, and should have a place in our public schools. I am delighted to see that a public-spirited gentleman of Montreal has announced his intention of establishing schools of this class in a number of towns, and while I regret that Toronto is not to share in his beneficence, I am glad to know that a beginning is to be made which must result in the greatest good. I heard an educationalist of considerable note declare that the difficulty of securing teachers was practically insuperable. Sir Wm. McDonald knows where they are to be found, and will send to Sweden, where the combination of the *Slojd* school with the common school, such as exist in Sweden and Finland, is founded on the idea of the value of handwork as an auxiliary to mental development. Many industrial schools in America have not been successful because they have aimed at making specialists rather than fully rounded men. The real object of the school is not to impart knowledge, but to cultivate the ability to acquire knowledge. We are all interested in the material progress of our people; to promote this let us encourage a change in which the manual element has some share. We have now in our higher institutions laboratories of chemistry, physics and biology, and we do not grudge them their possession, but why should it not be equally reasonable that for the many whose completion of preparation of life's work does not take them to these higher institutions, provision should be made with a laboratory for general handwork in connection with the common schools, perhaps not in every such school, but as is the case in Scotland, certain schools be set apart

for their possession. To accomplish the work that such a course would imply, I would suggest the lengthening of the daily sessions, making from 9 to 1 the general literary training, and from 2 to 5 the manual and industrial work, twice a week. Thus would I lay the foundation that could further be built upon by higher institutions, such as the technical schools proper and our admirable School of Practical Science. I would have these higher technical schools in various sections of the Province, and as a beginning would institute the teaching of special subjects in different days in each, thus making it possible for the same professor to teach the same subjects in the different schools. This is the system of the Germans in the employment of scientific experts in their department of agricultural technology, which has produced wonderful results, but there is another side to our educational problem to which scarcely any attention has been paid in Canada. I refer to domestic science. We have done much to educate our girls in ones that bring their services into direct competition with those of the male population, but really nothing to teach them how to dignify the work of the home. Indeed, the girls of the average household too often regard ignorance of housework as a badge of good social standing. This is true, not only of the wealthier but also of those not even well to do, and the insane desire for cheap notoriety is proven by the fondness for notices in the so-called society columns of our newspapers. Why is this so? In my opinion, it is because our schools are neglecting the teaching of sound and wholesome conditions in which the happiness of life consists. In the education of every girl provision should be made for her proficiency in household duties. And in this I have found no such complete provision anywhere as in the British school system. I heard it remarked not long since by a prominent educationalist "that the belief in this country is too common, that the short road to industrial prosperity lies through the adoption of an extensive system of elementary technical training." I would much regret if this were really true. I have not myself heard such an idea advanced. I do not think any one whose opinion could be valued would expect technical education to turn out in every instance a brilliant graduate, or to be reproached for not doing so, any more than to look for overpowering ability in every classical graduate. No system of education can remedy a deficiency of brains in any student, and failure to do so cannot be held an evidence of weakness in the system. It is not the adoption of a system but the zeal with which the students pursue their course, assisted by the brilliancy of their intellectual powers that ensures success.

The system of instruction in our Agricultural and Dairy Schools, and the success of their efforts to improve our dairy products is the most striking tribute to the value of technical education. Every Canadian country merchant can testify by sad experience what losses were occasioned by buying butter from promiscuous

sources, and every exporter can show large balances at the debit side of profit and loss as the result of shipping to Britain. This has been changed by trained teachers holding Dairy Schools throughout the country, and to-day our butter rivals Danish butter in the British markets, as the increase in the value of its export, which in 1894 was valued at \$437,988, in 1898 was \$3,217,004.

I need not mention cheese, in which we have long held supremacy. Though not the purpose of this paper to deal with articles of trade, I may be pardoned for remarking that in connection with our fruit waste, the loss from which annually would reach enormous figures, we should be able to manufacture jelly, the annual production of which would surprise us, and an export trade in it would in a few years equal that now done in butter. There are two factories in Dusseldorf on the Rhine that for this purpose alone use annually 550,000 lbs. of German fruit waste, and about 2,000,000 lbs. from Holland to manufacture into jelly. What prevents us doing this trade? I answer, want of technical instruction in this line, but in addition to efficiency in production, we must have equal ability in distribution, and this brings us to notice the necessity of some training for merchants that will be technical in its nature and broader in its application. Commerce fills a larger place in the world to-day than ever it did before. To this generation and the next are open broader possibilities than were ever the good fortune of any previous age to possess. The application of inventions to the annihilation of time and space has made all the nations of the world near neighbors, and has swelled the volume of trade far in excess of the growth of the world's population. This has caused an increasing keenness of competition until now success may depend upon the skill and shrewdness of the men who manage the business of distribution. It has been said, "Commerce is the basis of all true civilization." If this be accepted as correct, then it follows that those who direct commerce should have special training to fit them for their responsibilities. It is to the belief that this is the case, that the necessity of commercial education is occupying so large a place in the discussions of commercial bodies. One of the significant facts of the time is the demand for an education that fits young men for the practical requirements of the business world. The conditions of this country to-day are ripe for the introduction of a curriculum even in our elementary forms looking towards training boys for business careers. Germany, France, Belgium, Austria and Switzerland are conspicuous for the introduction of commercial courses leading up from the elementary through the secondary to the Commercial High Schools. I have seen in use in the secondary forms in Belgium and France an admirable system of actual business plan of teaching business and accounts, and a scheme of laboratory business practice, wherein the pupil is trained to do business as it is

done in the business office, and keep books as they are kept by the actual accountant, banking and exchange cheques, bills, notes, all arranged in a manner to engage a boy's attention and give him a pride in his miniature business transaction. On enquiring the authorship of the system, I was surprised to find it was imported from America, the work of the Ellis Publishing Co., of Battle Creek, Michigan. I understand the system is in use in 3,000 schools and colleges in the United States, and it would be a distinct move forward were its adoption authorized in the schools of Ontario. As an evidence of the growth in favor of commercial education in the United States, and revealing the strength of the feeling that schools are not meeting the demands of the times in this direction, I quote resolutions adopted by the New York Chamber of Commerce at a recent meeting :

"Whereas, the modern conditions of commerce and industry require wider knowledge and higher education on the part of business men; whereas, the present educational facilities offered to business men are inadequate, and fail to equip them for competition in the world's commerce, Resolved, that the Chamber of Commerce of the State of New York earnestly favors the establishment and development of sounder commercial education both in secondary schools and higher institutions of learning."

Had these been formulated by a Canadian Board of Trade they could not better have stated the necessities of Canada than are herein contained.

I would have a system of agricultural book-keeping that would instruct the farmer that his occupation is a highly commercial business, and a system of book-keeping applied to the results of the several industries on the farm would lead him to discover whether he is working advantageously or not. Modern farming, particularly in Ontario, is distinctly a manufacturing business. Any means whereby the fact can be brought to the mind of our agriculturists that they must be manufacturers as well as producers of raw material from the soil would be of inestimable benefit. By manufacturers I mean the transposition of the raw product of the soil into butter, cheese, hogs, cattle and the return of the by-product, manure, to the soil.

The American Bankers' Association has done much in the United States to further the cause of Commercial Education by arousing public attention to its necessity, and, as already shown by the action of the New York Chamber of Commerce, a more general introduction of such schools will soon follow. While continental countries have long had a system of commercial instruction, Great Britain has done very little in this line; but recognizing the need of something more practical in this way, the establishment of such a system is one of the most important subjects on the agenda for discussion at a meeting of the British Chambers of Commerce to be held next June. We in Canada anticipate a large expansion of our export

trade. How important, then, that our youth should be taught something of the industries, products, means of transportation, business methods and commercial demands of foreign countries. The report of the sub-committee appointed by the Board of Trade to formulate a plan for Commercial Education is the most complete that has yet been compiled on this continent and has been asked for by consuls of foreign countries for transmission abroad. An eminent authority in New York expressed his pleasure to me at the completeness of provision for every department of commerce contained in it.

The creation of a Commercial Museum, after the style of the wonderful institution of this class in Philadelphia, would prove of incalculable value in educating our people to the possibility of foreign commerce and the necessity for closely studying the particularities of probable customers. To illustrate, let me state a conversation I had at the recent Trade Congress with a delegate from Trinidad. Asked if there was a large consumption of Canadian flour in his island, he replied it did not seem to give the satisfaction that American flour did. I expressed surprise and pressed for the reason of our flour not being in favor. He replied, "You don't put the right kind of a hoop on your barrels."

We boast of our great country, and justly so, but let us not forget that mere bulk is no advantage. Greatness consists not in breadth, unless reduced to manageable proportions, but in the skill and resource with which the varied interests of our country are directed. Industrial conditions only constitute the setting in which the life of our people is placed. Social and industrial progress cannot be separated. Good times and happiness can only find a permanent abiding place with our people when our industries of every sort and our commerce are directed by the highest skill, and this can only be reached through the best technical and commercial training.

The development of our resources, if rightly directed, will outrun the dreams of the wildest enthusiast. Let us see to it that any new ideas advanced are given due weight, remembering that methods useful in the past in their entirety may be only so to a limited extent now.

New occasions teach new duties,
 Time makes ancient good uncouth;
 They must upward still and onward
 Who would keep abreast of truth;
 Lo, before us gleam her camp fires,
 We ourselves must leaders be,
 Nor attempt the future's portal
 With the past's blood-rusted key.

JAMES D. ALLAN

