

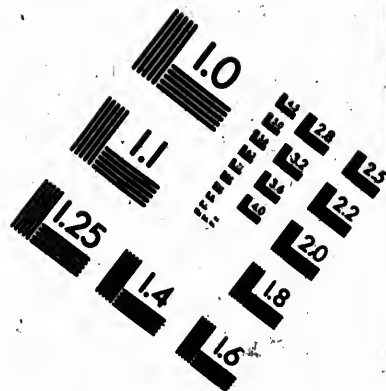
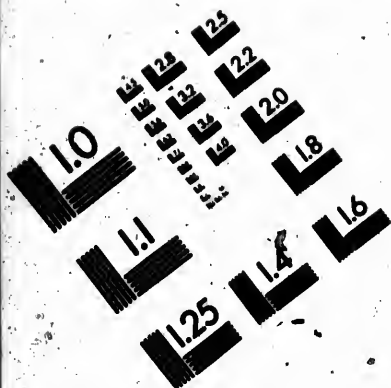


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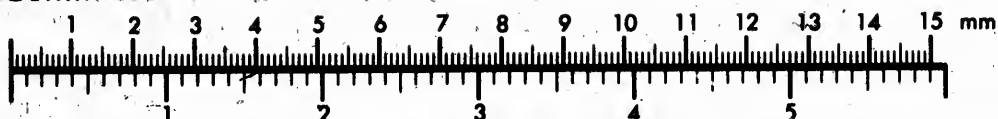
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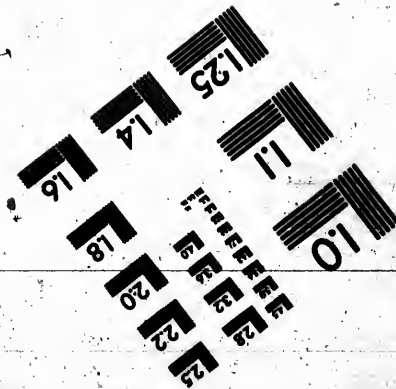
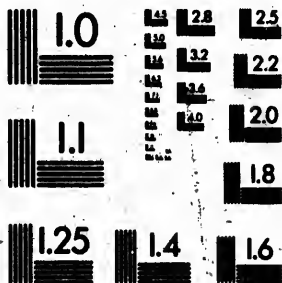
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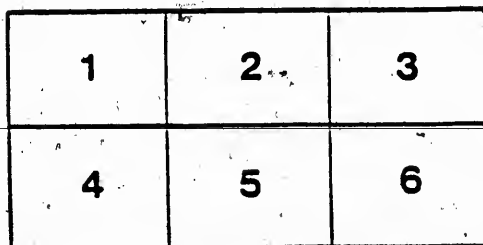
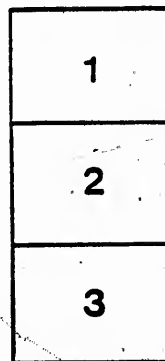
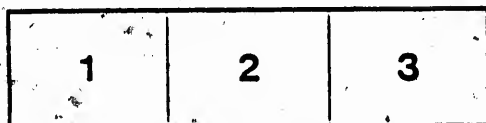
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1899  
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**A PAPER**  
ON  
**TECHNICAL EDUCATION,**  
BY  
**Lieut-Col. Farewell, L.L.B., Q.C.**  
**WHITBY, ONT.**

*(Read before the Ontario Educational Association  
at the Easter meeting, 1899, and specially printed,  
with resolutions, from the published minutes of the  
Association, by order of the County Council of the  
County of Ontario.)*

It is advisable that the study of Languages other than English should be discontinued in one third or one-fourth of our High Schools and that Manual Training and instruction in the use of tools and implements and in subjects having a practical relation to agriculture, mechanics, manufacturing, and mining should be substituted therefor.

In discussing this proposition it is advisable to consider what is the object of a system of public instruction and why the state takes this matter under its control. All right thinking people agree that it is necessary for the safety and prosperity of a nation and the development of its resources that the state should see that its people are reasonably well educated. It has been by common consent agreed that provision should be made for the special training of those intended for the professional life. It has not yet been settled by competent authority that special training should be assured only to those who are to engage in professional pursuits. If there are other pursuits upon which human

comfort and happiness largely depend and special training can be advantageously given to qualify those engaged in these pursuits, common justice requires that such instruction should be given. It is obvious that the number engaged in teaching and other professions is but small compared with the great army who are engaged in agriculture, mechanical arts, manufacturing, mining and commercial pursuits. The absolute injustice of supplying special training for the professional class alone, is still more obvious when it is considered that the property of the Doctors, Lawyers, Teachers, Engineers and Clerg-men is but small in proportion to the property of those who are engaged in the production and distribution of wealth from which taxes for public instruction are raised. One might well suppose that the struggle would have been how to raise the means for paying instructors in the classics, French and German, and that there would have been found in every county at least schools for teaching all that could be taught to aid the great producing classes in their struggle for existence.

What is the record in this respect in this great province? One Agricultural College, one school of Practical Science, one school of Mines, and one school of Technology maintained by the city of Toronto.

Commercial students are now receiving some attention in High Schools but only after private enterprise had recognized the wants of the great commercial class by establishing commercial colleges in the cities and large towns.

The establishment of these commercial colleges should long ago have shown our Legislators and Educational Authorities that more attention should have been paid to the training of boys for the business of life, even if the attention of the authorities aforesaid had to be withdrawn for a few moments from the Classic and Modern languages.

It is not a question whether classics or science affords the best educational training; as Sir John Playfair puts it, the question is "Whether the schools will mould the minds of boys according to their mental varieties."

The competition is too keen now-a-days to waste the time of boys in learning Classics and Modern languages to develop their intellects and cultivate their aesthetic sentiments, while there are so many things to be learned which have a plain relation to the business in which they are to earn their bread and butter. Is it possible to organize schools in which can be taught successfully subjects which have a practical money value to the farmer, mechanic, the miner and the manufacturer, and which will cultivate the eye and hand to the execution of designs, and the use of tools, so that the pupil may have his ability in that direction tested and be able if he has aptitude for such work to take up readily whatever art he follows, or if a farmer enable him to perform during his leisure, work which, acting as a diversion to the routine of life, will be of no use to him in the improvement of his buildings, gates and fences, and in making repairs to machinery when time is of the

greatest importance to harvesting and securing his crops?

Can such subjects be taught under such surroundings as will keep the pupils in line with their intended occupations and not "side track" them into the professions?

While High Schools and Collegiate Institutes have of late years been made much more useful to the great body of pupils because they have been made more practical by teaching more of what pupils needed to learn it is still a matter of well founded complaint that the tendency of these schools is to divert pupils intended for other pursuits than professional life into that life; that when once the boy whose parents desire him to follow farming or a trade gets into the High School there is but little chance of getting him back to the farm or work shop.

If the youth has not been born constitutionally tired, a dislike and contempt for manual labor is engendered which starts the boy into the professional course, resulting in success or failure, or else in causing an unsteadiness and unrest which ends by his "going to the States," and swelling the number of exiles driven there by failure of the Educational authorities of this country.

I am quite aware that it may be said the study of languages is not compulsory. Most of us remember well enough when "a slavish imitation of the Old Country Grammar Schools" made such studies compulsory by the written law as they are now by the unwritten law.

"What's the good of a boy who does not study Latin anyway" is the often expressed feeling of the High School boy who does study Latin. Is Sir Lyon Playfair right in his theory that "schools should aid boys in discovering the class of knowledge best suited to their mental capacities so that knowledge may be specialized to cultivate the powers of men to the fullest extent?"

Is Herbert Spencer's charge against the schools of England applicable to our own—namely, "that which our school courses leave most entirely out, will be found that which most nearly concerns the business of life?"

If the carrying on of agricultural mining and manufactures in the best possible manner, is of any importance to this young and promising country located alongside of a keen, active, practical nation of 70,000,000, it is about time some provision was made for schools in which boys "can discover the class of knowledge best suited to their mental capacities."

Our First Vice-President, Mr. Chown in his able paper on Manual Training read before us in 1897, which will well repay your careful perusal, quotes from Froebel as follows; "The human mind is *creative* as well as *acquisitive*. A scheme of Education which concerns itself with the *acquisitive* powers merely, and this has been the usual scheme of the schools hitherto, is fatally one sided and partial. Man is developed and cultivated towards the fulfilment of his destiny and mission and is to be valued even in boyhood not only by what he *receives* and *absorbs*



from without but more by what he *puts out* and *unfolds* from himself. Experience and history teach that men truly and effectually promote human welfare much more by what they put forth from themselves than by what they have acquired."

The nascent period for developing the forms of manual skill is from about four to fourteen. The brain centres which preside over the movements of the hand develop rapidly during this period and attain a greater degree of efficiency than it is possible for them to reach at any later period of life.

It would seem that if the reasoning of this great teacher is correct, that the arts upon which human life and happiness depend so much can be greatly benefitted by Manual Training, and the best interests of the country promoted.

How does the theory stand the test of experience? The Kindergartens of Germany and other countries have trained the young children. The Russian Manual Training of De la Vos spreading over Continental Europe has trained the older boys for doing fine and intricate mechanical work. Sir Lyon Playfair asks, "Why is it that we see whole branches of manufactures where they depend on scientific knowledge passing away from Britain where they originated in order to engraft themselves abroad and leaving only their decaying roots at home?" His answer is that "The English system of Education is too narrow for the increasing struggle of life." "The English Railway and Engineer Review" says "Is it not strange that only a few years ago the electrical students in the United States had to send to England for text books, now we have the strange spectacle of English Engineers sending to America for machinery built according to the ideas of their former students."

How much does the British Empire and the world owe to its mechanics and manufacturers for all that ministers to the health, comfort and enjoyment of the race and yet how little is being done for the boys who are "to take up the burden" is too well shown by Mr Hubert MacWorsh, Government Mine Inspector. He said not many years ago, "is it not a little remarkable that nowhere in England as far as I know is the mechanic instructed in those simple rules by which he may avoid failures, shorten labor, raise his own value and improve his art."

We are supposed to have vast quantities of undiscovered and undeveloped mineral wealth stowed away in the Northern and Western parts of this province. What are we doing towards instructing any number of the young men of the country how to discover minerals and identify them, how to mine for them, how to protect the miners while carrying on the dangerous operations, how best to get the minerals to the surface of the earth and how to refine and make them saleable? Much valuable instruction in such subjects could be taught in the High Schools by Science and Mathematical Masters who had given



these subjects special study. Is there any more pressing or important question for the Educationist and Statesmen of Ontario than the mining question?

That there is need for such instruction is shown by the fact that not many years ago one in every eight miners was killed the causes being explosions, flooding of mines, defective machinery used in working the mines, or unskilled management of the same.

The coal traders of Great Britain in meeting assembled by request of a Parliamentary committee charged with enquiring into the causes of death to so many miners, declared that the high death rate was caused largely by the ignorance of the miners and their overseers, and recommended that mine owners should see that instructions should be given to the miners by which it was believed that the number of deaths might be greatly reduced. An eminent Government Mine Inspector stated in this connection that "there would be no difficulty in spreading amongst the miners the inclination and the means of becoming better acquainted with the operations upon which their lives depend," and that men might easily be trained as overseers and mine bailiffs, to the great advantage of the laborer and mine owner.

The defects of our present system have been pointed out by many United States authorities on educational matters as existing there also. Charles Francis Adams Jr., speaking of Massachusetts public schools which cost \$4,000,000 a year says, "The imitative or memorizing faculties only are cultivated and little or no attention is paid to the thinking or reflective powers, indeed it may be said that a child of any originality or individual characteristics is out of place in the public school. Wendall Phillips says of that system. "It stops too short and in justice to boys and girls and society it should see to it that those whose life is to be one of manual labor should be better trained for it."

The Russians have established and for many years successfully tested a system of manual training which is the pioneer of this educational reform. It is but the amplification of the Kindergarten system. It does not propose to teach the practical exercise of particular arts but to train the eye and hand to the execution of designs and the use of tools, so that the pupil may take up readily whatever art he may afterwards choose to follow. It has been copied in the United States in several schools in large cities, notably Boston, Chicago and St Louis. The rapidity with which this movement is being adopted is shown by the fact that in Sweden it was practiced in only 80 schools in 1876, and in 1882 in 500 schools; in Finland it is practised in all the schools. The French law of 1882 makes it obligatory.

There has, I understand, been much said about tariffs, bonuses, drawbacks and other contrivances for improving the mining and manufacturing interests of the country. These may be very useful in their way if the party in and the party out of power can be got to agree as to them and the time and extent of their application. Have we given enough attention to the fact that knowledge, skill, precision and ex-

cellency of workmanship have all much to do with the success of manufactures and their ability to hold their own at home and make their way into foreign countries? Have we taken any means to secure these qualifications with success? In this restless age, in this hustling, bustling western world, apprenticeships to trades, except the trade of the lawyer and surveyor, are almost things of the past. It may be too radical a change to apply manual training to the Public Schools, the pupils of which are already overburdened with subjects, so much so that it is a great question whether it is possible that any benefit may be derived in the attempt to teach the elements of agriculture there, but surely a system so well recommended should be tested somewhere in this province. Huxley has said, "We cannot continue in this age of full modern artillery to turn out our boys to do battle in it, equipped only with the sword and shield of the ancient gladiators." Where can the system be tested with greater prospect of success than in the High School, where the pupils have all attained sufficient education to appreciate scientific and practical instruction.

The school as proposed would give to the pupils all the advantages which High Schools now give, with the exception of instruction in classics, French and German. The English and Commercial masters would be retained. The Mathematical master would probably need a special course in a school of practical science to qualify him to give instruction in Statics and Dynamics, the uses of the mechanical powers, the amount of power or speed obtained by their use when combined with machines, and in general the subjects and machinery treated of in the branch formerly called Natural Philosophy. He should give practical instruction in measuring and estimating the capacity and strength of buildings, the quantities of earth to be removed from any place and the quantities required to be placed in any position for a particular purpose, the measurements of solids and superficies, the elements of surveying and levelling, the strength of metals and woods, the means of calculating the power of steam engines. The Science master would give instruction in Chemistry and Botany, and in connection with this department would explain the blights and the insects which attack the grains and roots grown by the farmer, and the means of preventing injury from these as far as known, the value of different kinds of manures and the relation of chemistry to agriculture; he would also give instructions in mineralogy and geology, particularly as to exploring for and testing minerals, the causes of accidents in mines, and the safe guards which should be adopted to prevent them by proper ventilation use of safety lamps, etc., the general principles as to faults in mines, the liabilities of mines to be damaged by water. He should give instruction in Chemistry in all its applications to the arts in which his pupils are likely to be engaged.

But questions may be raised as to the expense of instruction in Manual training and of purchasing tools and machinery for equipping the schools. In view of the important benefits to be derived from the system and the large amount of taxation paid by the large number of

people who would be benefitted by it, one might be tempted to say, "confound the expense." Though it be expensive we must have it; fortunately there need be no dismal apprehensions as to this part of the question. I am told by M. Harper, Esquire, Whitby, who is an up-to-date manufacturer of iron and wood working machinery, and who has had practical experience in working both wood and iron as a carpenter, pattern maker and machinist, that a shop furnished with a steam engine, shafting, and iron lathes, forges, carpenters' and machinists' tools, so as to give instruction as above indicated, could be equipped for the sum quite within the means of a School Board of any town, and for a sum which would be amply repaid by the increased value of boys' services when they left school.

As to the cost of practical instruction, there is probably in every county of Ontario one town having a High School and having manufactories in which wood and iron work is carried on. In these could be found men capable of giving practical instruction in carpentering, wood turning, forging and other iron work, and in the management of stationary steam engines. The services of such men for two hours a day could be procured for a sum very much less than it costs to hire two Masters for classics and modern languages, so much less, in fact, that there would be a balance for expenses of running the engine and providing materials, models and drawings for use of the shop.

In a school so qualified a fair test of a boy's ability to succeed in the mechanical arts could be easily made. Instruction could be given in practical work to such an extent that a boy leaving the school, after a course there, could at once earn his living. The associations and influences of such a school would be all in line with the boy's future course in life; he would have acquired a respect for manual labor which to him would be dignified and ennobled by the fact that it was connected with and dependent upon scientific principles, he would be animated with hopes and aspirations as to distinguishing himself in his calling, he would realize the force of Longfellow's Invocation to Labor.

"In the world's broad field of battle, in the bivouac of life  
Be not like dumb driven cattle, be a hero in the strife."

Such a school might be made of great practical value to the state in different ways; for example, there are thousands of steam engines and many of them with boilers of great size, used in closely populated towns or connected with manufactories employing large numbers of workmen. We are all too familiar with boiler explosions.

What security has the public that the men in charge of these engines know anything of the construction of the engine or the causes of these unexpected things that happen just about the time of an explosion. Instructions in the principles of an engine and as to how accidents may result from mismanagement would be of great value to the engineers. With schools where such instruction could be given, a system of licensing qualified engineers could be adopted to the greater safety of the public both as to their lives and their property.

Once established the pupils would come, not from the homes of me-

mechanics and farmers alone, but by a natural selection of occupation from the commercial and professional classes also. Men who would otherwise be third rate professional men, unsuccessful, disheartened, and a nuisance to the public, would become active, skillful and successful producers of wealth. There is surely no such want of professional men or teachers as to render it necessary that all of the High Schools of the country should be worked to their fullest capacity to turn out candidates for the University.

The attempt could safely be made to convert one-third or one-fourth of the classical schools into practical science schools on the lines above indicated.

I have no doubt the Hon Minister of Education has given this question much thought, and is prepared to admit that the question should receive attention at an early day, any day in fact when the country will support him in the measure. I trust this association will make such representations to him that he will think this question is now within the range of practical Educational reform.

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It was moved by Mr Farewell, and Mr Peter Christie, (Ontario County), that in the opinion of this High and Public School Trustees Department of the Educational Association, it is expedient that the study of Classics and Modern Languages other than English should be discontinued in one-third or one-fourth of the High Schools of the province, and that Manual Training and Instruction in the use of tools and implements, and instruction in the subjects having a practical relation to Agriculture, Mechanics, Manufacturing and Mining should be substituted therefor.

After this motion had been briefly discussed by Messrs. Chown, Smith, Werner, Elliott and Rev Mr Cook, it was

Moved by Mr Hugh McMillan, Guelph, and Mr E C Pearson, Weston, and resolved that this department extend to Mr Farewell a hearty vote of thanks for the excellent paper which has just been under discussion; and that the Printing committee not only incorporate it in the Minutes of Proceedings of this department, but that it have as full a report in the newspaper as can be secured.

Mr John Ball Dow, of Whitby, seconded by Rev. W A Cook. Thereupon moved that Mr Farewell's paper on "The elision of the study of languages from one-fourth or one-third of our High Schools, and the substitution of Manual Training and Instructions in the use of Tools and Implements," and his motion in connection therewith, be referred to a special committee to be nominated by the President, with power to receive information from Boards of Education generally throughout the Province, and from any other sources, and to report to the next session of this Association, a scheme for carrying into effect the suggestions contained in his paper. Carried.

The President nominated the following special committee: Mr Farewell, Q. C., etc., Whitby; Mr G Y Chown, B A, Kingston; and Mr A Werner, Elmira.

