

CHAPTER XV: SUMMARY OF OTHER TESTIMONY AS TO ELEMENTARY EDUCATION.

The opinion was expressed that the curriculum was too crowded and did not allow room for industrial training; that the teaching was not properly arranged and was less thorough than forty years ago.

One witness considered that agriculture should be taught in preference to Latin. The boys needed inducement to go into manual labor.

The teachers might find out in the early grades what occupation a boy was most fitted for. The schools at present held the wrong kind of ideal before the boys and the curriculum was not such as fitted the boys for trades.

Complaints were also made that agriculture was only nominally taught and that, in consequence of the curriculum being too heavy to add technical subjects, the schools were unable to educate farmers.

Some subjects might be dropped and map drawing introduced instead of Latin. Latin was of little value to most of the children and what the boys needed most was arithmetic, drawing, and ability to read plans. The schools were not at all satisfactory, boys did not recognise the teachers' authority and the teachers were not backed up by the Trustees.

Many of the children had to work in factories instead of going to school. A large percentage of the children in St. John left school at fourteen, only about ten per cent continuing after that age.

Training in writing and spelling is much needed and one witness suggested that a phonetic alphabet was required. The writing was stated to be worse than twenty years ago and the general demand for commercial education was increasing.

The schools at present do not prepare for industrial life, and an advisory committee was suggested for the schools to guide boys in the selection of an occupation. Secondary industrial schools were favored for boys between fourteen and eighteen. The chief difficulty was the attitude towards manual labor; and the social view must be corrected before real good can be achieved.

One witness stated that the public schools were starved, and another that the results were not commensurate with the taxation. The Common Schools Law is thought to be unjust to the poor settler. In back districts farmers paid \$2 on each \$100 for school taxes, yet one witness owning a farm valued at \$25,000 paid only between \$30 and \$40 for schools.

CHAPTER XVI: SUMMARY OF OTHER TESTIMONY AS TO SECONDARY EDUCATION.

One witness thought scholars should have option of agricultural or mechanical studies in High School. Another thought Normal training should not be less than one year. Normal School students should have a course in dairying and bee-keeping. Teachers should be improved in Manual Training and Domestic Science facility by having summer courses every year and should return and qualify in extra courses. If they were diligent they might get sufficient training during the Normal Session to be able to teach Manual Training. Teachers' Institutes have been of help to a new trend of thought. Summer Schools, especially that at Truro, have been very useful.

Several witnesses had taken Correspondence Courses at \$55 or \$60, some in mathematics and some in architecture. The manager of the Sulphite Mill had taken mathematics, geometry, paper-making, electrical engineering. Journeymen need more training; some have taken a Scranton Correspondence Course, but many are too backward in general education to profit by it. One witness, who had served a regular apprenticeship as a machinist, read mechanical books, and took a course at the business college and a course at Scranton costing \$80, thought he could have learned more in a night school. One witness said he thought 75% of those who took Correspondence Courses would attend a Technical School in preference if one was provided. The Scranton Correspondence Course is approved for apprentices, but as preliminary education is necessary in order to profit by any Correspondence Course, a personal teacher was considered better.

Continuation schools are much needed. Steps should be taken for the further education of those who leave school at fourteen. Boys of 18 require instruction to learn to make their business pay.

A Principal deplores the small number of boys who go to High School. He is convinced that they do not receive the encouragement they should to complete their school course. Strong evidence is given by the fact that many pupils in the lower school are kept away for a month or more at a time to work for wages, or for less important reasons. Once a boy has fallen behind his class, he can hardly be expected to take a normal interest in his work, and parents as well as pupils must be led to see how poorly equipped is the boy of to-day without at least all the education provided by the school at his door. A step that would go further towards improving these conditions, but that would yet reach only a portion of the boys and girls, would be the providing of a thorough business course which would include arithmetic, literature, composition, grammar and penmanship, along with the purely commercial subjects.

A suggestion was made of a central school in connection with the University, for industrial work, with sub-schools, evening schools and trade schools in different sections of the Province.

Technical Education would be useful in St. John and would greatly assist in different problems. If it were established there should be classes in drawing, book-keeping and stenography. Separate schools for industrial training are an immediate need and the School Board of St. John would allow the use of school rooms.

Children should have lessons in industrial economics and a technical school would make the selection of those best fitted for industries possible. Technical education is good for boys, but it must be recognised that they can only learn how to do things by doing them. Practical work in addition to technical education is necessary.

Technical education is necessary to give workmen the necessary knowledge to make them skilled. Machine operators require mechanical skill and mechanics complain of lack of arithmetic and drawing.

It would be dangerous if the schools educated boys to push out workmen. Men trained for engineering must have shop work as well. There should be a primary Technical School, supported by the community, for boys from 14 to 18, with more science teaching. A school like the Manchester (England) Technical School is suggested.

EVENING CLASSES.

Compulsory evening schools are needed and would be more likely to succeed if of a practical character with Manual Training, Domestic Science and Nature Study. A special course in Navigation is suggested by a former teacher in St. John. Evening schools are needed for home-making and cookery for women in factories; and the classes should be free. One witness said he would go himself two or three nights weekly and he thought the majority of the men in the shop would if drawing and mechanical engineering were taught. Printers would go and the Printers' Union has a course prepared, including courses in punctuation, advertising, drawing and designing. A printing plant is desired.

One witness doubted whether there would be a large enough attendance at the evening school on account of the men being fatigued with their day's work. He thought the introduction of an eight-hour day would help in this respect. There were from 400 to 500 lads of from 14 to 17 years of age in St. John who were learning trades and who would value the assistance of an evening school and in this way the evening school could be made to benefit the industries.

Evening school pupils are more earnest than day school pupils and a class for apprentices twice a week during the summer months would be of the greatest advantage to earnest boys. One witness thought boys would be too tired for evening classes.

Evening classes would be very helpful to foundrymen but would not help apprentices much beyond stimulating general intelligence. Some would profit a great deal but others would prove to be too careless.

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Lectures should be given on the leather trade, as the men would prefer a lecture once a month to an evening school, which would have to be interesting to do good.

In England evening schools were the rule rather than the exception. Foremen would be the best instructors for apprentices and journeymen. If a class were started in Woodstock, the Board would probably grant the use of the building. St. John had evening schools for two or three years in different subjects but not industrial training. The public school building was used last year and sixty pupils attended. The King's Daughters had a class of ten or twelve for bookkeeping and penmanship. Scientific subjects would be popular for lectures.

CHAPTER XVII: THE UNIVERSITIES IN RELATION TO TECHNICAL EDUCATION.

SECTION 1: THE UNIVERSITY OF NEW BRUNSWICK.

The University of New Brunswick, located at Fredericton, is a Provincial Institution supported by Government grants, endowments and fees from students. The Lieutenant Governor in Council appoints 9 members of its governing body, the Senate, including the President and Chancellor; 4 are elected by the Associated Alumni; and one by the Educational Institute of New Brunswick. The President and Chancellor (the former being the Chief Superintendent of Education for the Province) are permanent members of the Senate; the others hold office for two or three years, as provided by law. The Chancellor is the Chairman of the Faculty and administrator of the affairs of the University. The Senate appoints the professors and other officers and fixes their salaries. The University provides a four-year course for degrees, students of both sexes being admitted to the Arts course on equal terms; matriculation examinations for admission may be written either at the departmental examinations held by the Board of Education in July or at the opening of the University in September. The student in any county who makes the highest standing in the July matriculation receives the scholarship of \$60 for that county, provided such student attends the University.

The Department of Applied Science gives a thorough and practical training in Engineering and Forestry, and fits students for business and professional careers. The course is made as comprehensive as possible, to include all branches of engineering—Railroad, Hydraulic, Highway, Municipal, Bridge and Structural, Sanitary. Students are prepared for the examination for Deputy Provincial Land Surveyors. In the Civil Engineering course some Steam and Electrical Engineering is given. The Electrical Engineering course comprises extensive laboratory work.

The Forestry course is the same as the Engineering in the first 2 years, with the addition of Botany and Forest Botany. In the last 2 years the pupils study the application of modern scientific forestry methods.

The laboratories comprise: a Cement Laboratory, for testing all kinds of cement; a Testing Laboratory, containing a standard testing machine, return tubular boiler, Robb-Armstrong engine, steam engine indicator, screw cutting lathe, machinist's bench, and hand forge; a full equipped Physical Laboratory; a Chemical Laboratory and Geological Laboratory. There is an Observatory, full equipment of field instruments, and forestry equipment.

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A Scholarship is awarded to the most successful student in 3rd year Physics. The City of Fredericton gives a Gold Medal in Engineering, Chemistry and Forestry in rotation.

There is a well equipped Museum in connection with the University.

FROM DR. C. C. JONES.

Information obtained from Dr. Cecil C. Jones, Chancellor of the Provincial University, Fredericton, N.B.

There are Arts and Applied Science departments, the latter including Civil and Electrical Engineering and Forestry, the last-named being the most recent addition. The course in both departments is 4 years. This University is not affiliated with any other institution for advanced work. There is no department for Agriculture, but a little agricultural chemistry for schools is taken up.

The students mostly come from New Brunswick, the attendance being about 168. The entrance requirement in both sections is the same, except that Latin is not included for the Applied Arts department. Applied Arts students are not quite so well prepared in the High Schools, and therefore the work in this department is more elementary.

The Forestry Course aims at training efficient foresters for the Provincial service. The University has a forest of about 6 square miles for practical work. Hitherto, the graduates have found employment chiefly in the Dominion Forestry Department, and many join survey parties in the west.

Graduates and students of the Engineering Course find employment in connection with railway work, etc. The Electrical Engineering men work in summer at surveying work. This summer work is essential to their training. The University has a Mechanical Engineering Department, but no course for a mechanical engineering diploma. There is a demand for it, and if means were available, it would be established.

Students in the Electrical Engineering Department make observations at the plant of the Fredericton Electric Light Company, and work there during vacations. The attendance in the Engineering Departments has increased four or five fold in 10 years, and if a larger equipment were available, more students would come. In the Civil Engineering course one teacher gives his whole time, and the professor of mechanical engineering and drawing gives the drawing to mechanical engineering students. The electrical engineering man gives part of his time to physics, with one or two student-demonstrators to assist him. There are more students in the Civil Engineering Department than any other.

The extension of Industrial Training and Technical Education in New Brunswick would not interfere with the Arts course. It would need to be continued on the best lines possible. It is a great advantage for the Arts students to mix with the others.

In regard to short courses for teachers, the Chancellor thought the University could co-operate with advantage in vacation courses. The University should be as closely identified as possible with the progress of the common schools.

Nature Study and Domestic Science in the public schools would not menace the supply of pupils to the University. Nature Study begun in early life is a good basis for science work at the University, and Manual Training would be especially valuable for the technical courses. Speaking for himself, Mr. Jones favored any effort to advance Technical Education or Industrial Training, if means permitted of it.

The University has been urged to take up Agriculture, but this would be impossible without a special grant from the Province.

There are no funds for research work, and none is undertaken, beyond what the professors take up for themselves.

Chancellor Jones said he did not altogether sympathise with the criticism that the school curriculum points directly to the University. He is a member of the Committee that settles the course of study for the schools, and expressed himself as fairly well satisfied with the present course of instruction. In the Civil Engineering course at the University, French is required instead of Latin. The first two years include general culture subjects, with either German or French, and Mathematics, which is fundamental to this work. No higher standard of mathematics is expected than from Arts students, but more work. No specializing is done for the first 2 years.

Chancellor Jones had found that the Scranton Correspondence Courses were not a good preparation for entrance to the University, being too specialized. English is an essential subject for an engineer, as he has to make specifications and reports, and the correlated subjects are quite necessary for a thorough training. Dr. Jones thought it would not be wise to revise the present system so as to allow young men to enter who were not adequately prepared. He favored doing more along technical lines, with a Central School in connection with the University, and Branch Schools in different parts of the Province.

SECTION 2: THE UNIVERSITY OF MOUNT ALLISON COLLEGE, SACKVILLE, N.B.

This College was established under the name of Mount Allison Wesleyan Academy previous to 1858; in that year the name was changed to Mount Allison Wesleyan College, and in 1886 to its present title. It has Faculties of Arts, Theology and Applied Science, and is affiliated with McGill in the latter, students taking the first 2 years of the course here, and entering McGill Engineering faculty in the third year. It is also affiliated with the Dalhousie Law School.

The internal administration is conducted on non-sectarian principles. Its management is vested in a Board of Regents and a Senate, the latter body con-

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sisting of all the members of the Board of Regents and the Faculty; it is charged with such duties as forming the courses of study and conferring degrees. The general management of affairs is entrusted to the Board of Regents, consisting of 32 members, 24 of whom—12 ministers and 12 laymen—are appointed by the General Conference of the Methodist Church; 6 representatives of the Alumni Society and two representatives of the Alumnae Association of the Ladies' College. The University provides a 4-years' course in Arts leading to a B.A. degree, students of both sexes being admitted on equal terms; a Divinity course leading to the degree of B.D. (Bachelor of Divinity) and an Engineering course leading to entrance to the third year of the course of Applied Science in McGill University, Nova Scotia Technical College, and similar institutions. The Ladies' College and Boys' Academy prepare students for entrance into the University; the former also provides a course in elocution, painting, drawing, music and household science.

FROM PROFESSOR LAWRENCE KILLAM.

Information received from Professor Lawrence Killam, of the Mechanical Engineering Department, Mount Allison University.

The course here prepares for Worcester, the Massachusetts Institute of Technology, the Halifax Technical College, and McGill, the first 2 years being taken here. It is not intended to be a 2 years' short course, but is part of the 4 years' course. There are 212 men in attendance, of whom 42 are taking the general engineering 2 years' course. Most of the 212 take some science subjects. In the 2nd year class there are quite a number of students in Mining. They can go to the 3rd year at the Colorado School of Mines. Formerly the majority of the students went to McGill, but some are now going to Halifax Technical College. Most of them come from Nova Scotia and New Brunswick, from the towns. Some have worked in shops before coming. The average age on entrance is about 17, but some are over 20. The younger men are better at theoretical work, the older ones at shopwork, and the latter are generally harder workers, as they appreciate what they want to get. On entering the 3rd year of an Engineering College, students have to select a course, and the general 2-year course is a good preparation.

Prof. Killam considers that actual shop work is absolutely essential as a preparation for teaching other men. He does not advocate the week-about plan, as the men would get out of practice with both shop and theoretical work. Shops at the school are good, because students can go on studying without a break, and there is a great deal of drill in shopwork. The witness thinks that almost any mechanical engineer from McGill can have his choice of positions, provided he has done plenty of practical work. Some graduates of McGill start at 9 cents an hour, just to get practical experience. Manufacturers who take students realise that the training they have had makes them much quicker in the shops as soon as they have learnt the groundwork.

Men working in foundries would do well to go to evening classes, and the College would gladly give its plant for evening classes.

The witness left High School (11th grade), then studied at Mount Allison for 4 years in B.A. Arts course, taking extra mathematics. Then he went for 4

years to McGill, taking mechanical engineering to B.Sc. degree, with shop practice. The latter was useful, but not so useful as the actual shop experience gained later. He had worked his way through the shops, and found that this helped him greatly when teaching men in the shops. Manual Training at school would have awakened his interest and given him skill for practical work.

MOUNT ALLISON LADIES' COLLEGE, SACKVILLE, N.B.

This College was founded in 1854. The Conservatory of Music was erected in 1890, the Museum in 1895, and a new addition in 1903. In 1909 the Jairus. Hart Hall extension was added, and a spacious Household Science Hall was furnished by Mrs. Massey-Treble, provided with two teachers and all modern appliances. This department gives 2 years Normal Course for those having 1st class teachers' certificate, comprising physics, chemistry, biology, physiology, cookery, sewing, waitress course, laundry work, home nursing, practical hygiene and bacteriology, and home economics. In the second year, teacher-training is added. A 1 year Normal Course and a Housekeeper's Course are also given.

The Art Department contains the Owens Museum of Fine Arts, and offers Courses in perspective, composition, design, leather work, wood carving, metal work, china painting, sketching, etching, modelling, freehand and model drawing, and oil painting.

CHAPTER XVIII: AS TO INDUSTRIES.

The industries of New Brunswick cover lumbering, woodworking of various kinds, sawmills, planing mills, sash and door factories, boxes, spool wood, canoes; iron manufacturing from the mining and shipping of the ore, iron working including the manufacturing of engines and boilers, foundries, axes and edged tools, nails, fences, railway supplies, stoves, steam and gasoline engines; pulp and paper; brass works; brushes and brooms; can-making; leather tanning, boots and shoes; textiles, cotton and woollen clothing; foods, biscuits; fisheries, both shore and deep sea; mining, quarrying.

Under the Statute of 1900, entitled the Public Service Act, an officer of the Provincial Secretary's department is appointed as the Secretary of Industries and Immigration. His duties are "to collect and arrange facts and statistics relating to the agricultural, industrial, fishing, lumbering, milling, mining, quarrying, manufacturing and other interests and resources of the Province, and to adopt such measures for circulating and disseminating the same, as may be found best adapted to promote the progress of the Province and to encourage immigration from other countries." The Provincial Secretary may make arrangements with the Government of Canada for the collection and publication of information relating to the above subjects, and may also co-operate with the immigration service of the Government of Canada, or any other agency or institution, for the purpose of encouraging immigration from other countries to the Province.

SUMMARY OF INFORMATION FROM THE TESTIMONY.

BUILDING CONSTRUCTION.

Carpenters favor Evening School, one stating that he thinks it would "eliminate the grog-shop." The hours of labor should be shortened in order to get the greatest benefit out of Night School. The subjects most needed are drawing, arithmetic, building construction, plans, and strength of materials; construction of different kinds of roofs, and hanging doors and windows. Roof construction is a most difficult subject and could be acquired more quickly by having a competent instructor who would work it out practically. The expert mechanic of to-day is more expert than in the past, but would improve still more by Technical Education. Carpenters need instruction in the use of the steel square for drafting and measuring. Putting a sloping or gothic roof is quite a trick to the average carpenter who doesn't understand the use of the square. A boy who understands house building technically would be advanced faster than one who didn't. The more proficient men are the more quickly they do the work, and this makes them worth more. A Correspondence Course is good, but not to be compared with Manual Training. One witness states his son took Manual Training and now wants to be a civil engineer, largely owing to this; it helped him find his bent.

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Masons: Training in reading blueprints, arithmetic and strength of materials is most necessary for masons. Journeymen masons could learn from each other by talking things over in a schoolroom.

Plumbers: Plumbers should have instruction in the principles of sanitation, and should understand the dangers from leaking gas and liquid materials. It is better for the apprentice to have supplementary instruction while he is going as a helper rather than have it in a trade school where he has not such a varied class of work to observe.

Painters and Decorators: They need instruction in design, combination of colors, analysis of colors, and the scientific part of decorating, sign writing, fresco work, graining, nature of materials used, quantities and composition. Boys have no idea of the nature of the material they are using, and can do what they are told, but can go no farther than that.

BOOTS AND SHOES.

No designing is done; that is a separate business. Most of the skilled hands are trained by experience in the shop. An evening class in drafting patterns, etc., would be helpful. The business is becoming more specialized every day, and the only way to train a boy would be a regular shoe factory where he could have a chance of using all the machines, combining theory and practice. The half-time system would not be practicable.

A foreman stated that the men are not trained in quick perception and have not been properly drilled to use their hands. It would be a good thing to have a school where they could see things as well as learn, and go from abstract to concrete. It would be no hardship for shoe workers to attend Evening School two evenings a week.

A manufacturer of larrigans says the work needs a quick eye and sure hand, but that the men learn all they require in the shop.

CONFECTIONERS.

A manufacturer of confectionery thinks that the present school system educates boys and girls away from the desire to learn a trade. He suggests that some of the present studies should be dropped, and children given text-books about various industries, processes, etc., with a view to impressing upon them that brains are needed in industry as much as in professions.

HARNESS-MAKING.

A harness maker said that machinery is used more than formerly. Manual Training would broaden a boy's mind and awaken his mechanical instincts, and would be of a benefit when he went to a trade. There would be no benefit to young fellows in knowing the process of currying and tanning. A boy had better learn about leather work as a fine art.

METAL TRADES, ETC.

Boilermakers and Machinists: A general locomotive foreman in the I.R.C. shops said that the foreman is supposed to instruct the men in the principles of

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things. They work from blue prints. Men need instruction in strength of plates in the boiler department.

A manufacturer of boilers, engines and machinery said his employees would derive much benefit if they could get instruction in drawing, reading blue prints and strength of materials. It would be good if they could see demonstrations. His foreman had noticed a boy with Manual Training experience, and observed how much more quickly he adapted himself to the work. The three R's make the best foundation for a boy's knowledge. A boy who begins this class of work at 14 or 15 makes a better workman, because he knows what he is going to apply his knowledge to, and with the knowledge obtained at school, he can educate himself with books and papers. A well educated man without gumption is no use in trade or commerce. A man wishing to better himself can always find opportunities, and if he has a foundation of reading, writing, arithmetic and grammar, he will acquire education without the help of the State. At the same time, Evening Schools would be excellent, and it would be a good thing if foremen could come together and learn from each other.

A brush and broom manufacturer says Manual Training would help boys in the woodworking and machinist line by training their eye, though very little skill is required in this business. Mechanical drawing would be very beneficial to machinists in this trade. Machinery has almost entirely eliminated skilled hand-work in this industry.

The men in the Snowball Co. are developed right in the shops; the men are interested in the apprentices, because they all aim to be marine engineers and in order to pass the Government examination they have to have shop practice. They had never had evening schools; the men take technical papers and books, and the boys educate themselves.

Young fellows in I.R.C. shops will make quicker and better progress if they attend Evening School 2 nights a week. The best system would be to have a good instructor in the day time, and apprentices compelled to attend. Good demonstration shops would be needed to make them stay. A College course without practical experience will not qualify. The check time system prevents men from helping apprentices in shops. Men need education to run steam engine and mill machinery, and evening classes in mechanical drawing and engineering would help them, but need regular apprenticeship as well. A man cannot be a good machinist unless he has a knowledge of drafting.

A blacksmith says that Evening School for 2 nights weekly would be a good thing. A class in forging would be useful.

Blacksmiths should have instruction on the economical use of coal. When there is plenty of work in a rush and we get a big fire, the more coal used the more economical for the business. The main thing to know is how to get a good fire. It is cheaper to use best quality coal in the long run. Blacksmithing requires a trained brain as well as trained muscles; apprentices should have Technical Education along with practice. Where they used to hammer out a piece of iron for an article years ago, now they take the piece already rolled out about the right size and make the article out of it.

Foundrymen: Mechanical drawing is the chief subject a journeyman in a foundry should study; it would help him to know the conditions of smelting iron. Foremen need to be well informed regarding principles of business, study of metals, etc. They should take trade papers and study them. There is a great need for evening classes in the sheet metal business along geometry and Manual Training lines, designing and ornamental drawing. Moulders should know about moulding earths and sands and the difference between different kinds of iron; effects of phosphorus, etc. Ability to make sketches helps apprentices; they have to read blue prints to obtain promotion. Drawing in connection with Manual Training would meet requirements in many cases. Apprentices should go to Evening School while learning their trade, as it develops their intelligence, makes them keener, more alert, broadens their minds and develops them. The general educative effect of evening classes would be good, as it puts thinking faculties into operation and makes them more thoughtful and studious, developing their general intelligence, even if not teaching them anything definitely related to the trade. A trained intelligence is bound to develop a better workman. Manual Training develops faculties in a boy, and helps him to "find himself," as well as cultivating thoroughness, because he has to work by rule; thus he becomes exact and methodical.

A moulder said that Manual Training would help a boy in this line; inasmuch as the work requires great care and accuracy, it would be useful in that respect, as a careless man could never be a moulder.

Tinsmiths: Tinsmiths require training in reading blue prints, drafting and cutting patterns, and finding the contents of different shapes, etc. It is a hard trade to learn, because something new is always turning up; it is not necessary for a boy to be able to draw freehand and to scale, and to be good in arithmetic. It would be a good thing if plans from an architect's office could be shown to boys to familiarize them with plans. A boy would make the best workman by working in the day and getting practical education at night.

PRINTING AND PUBLISHING.

A foreman printer and compositor doubted whether an evening class would be much use to printers. A man can get the best instruction in an office and then finish off with something higher. Practical experience is the advantageous basis.

A linotype operator said that the International Typographical Union courses meet the needs of operators on all the latest machines, the only drawback being that they are so far away, and that men have to travel to the schools for instruction on machines. Printers need instruction in punctuation. The International Union is doing good work in introducing supplementary education.

A printer said that Evening Schools would be helpful in teaching artistic type-setting. A foreman would be the best instructor if he could express himself. Printers would like Technical Education directly connected with their craft, e.g. in designing work, job work, advertisements, the qualities of paper and inks, etc. In some cases the designing of advertisements is left to the printer, in others the designs are supplied. Printers need education in learning to know the relation of one part of type to another—how many spaces make an M-quadrant, for example.

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TEXTILES AND CLOTHING.

The best chance for education is the combination of day work and evening study. A workman cannot be made at school, but the ground can be prepared for a better workman. A man that took Technical Education with practical training also, would make a better workman. The cotton industry is much more highly specialized than formerly.

FURNITURE AND WOOD PULP.

Cabinet makers and furniture manufacturers need lessons in drawing and strength of materials. In St. John the Manual Training instructor brings his class before him and on the blackboard explains by diagram, plan, elevation and section, how a thing is done, material used and all other requisites; then he gives all technical information possible. The boys know how it can be done, but still can't do it; then they are taken to the Manual Training department and with appliances and tools there they learn to do it, thus combining theory and practice.

A master mechanic in the Miramichi Pulp Co. says boys need training in figuring and drawing, and should learn to read blue prints, and know chemistry and mechanics. The more intelligent the workman, the more he can be depended on. The more skilled the men are, the better the work and the less the waste.

HOME-MAKING AND HOUSEKEEPING.

Housewives need to be skilled and trained. The need is felt for evening classes in house-keeping and cooking for women who work in factories. It would be valuable to teach factory women about buying and cooking and ventilation. Many women don't know the difference between the nourishing value of a pound of steak and a pound of boiling beef off the shoulder; especially those who have to earn their living; the cheaper meat can be cooked up to be made very palatable and can be enjoyed just as much as the more expensive meat. Instruction of that kind would be good for the housekeepers.

WELFARE WORK.

The reference room at the St. John public library is open to the public from 9 to 12 hours daily. The building cost \$50,000, and was donated by Mr. Carnegie. It is maintained by the city. Pratt's list of technical magazines and books is kept on file. The workmen have asked for the library to be open after 8 p.m. and on Sundays. The library is used by the higher pupils of schools for essays and references.

Women have tried to have laws carried out for women and children in factories. A woman inspector is needed. The women in factories should be provided with seats, and have shorter hours.

The child labor problem is serious. Feeding of school children is advocated. Neither men nor children who are underfed should be expected to work.

Medical inspection of schools is much needed.

CHAPTER XIX: PERSONAL NARRATIVES OF TRAINING AND APPRENTICESHIP.

Wm. McGorman. Went to work at age of 10; blacksmith for 25 years; has worked in large establishments; now working with 10 others; making and repairing machines; learned trade here without any regular apprenticeship; formed night-school classes with 4 or 5 others who also needed it, and took up arithmetic. There are no apprentices here now; a boy comes in as a general helper, and picks it up. The shortest time to become a journeyman would be 3 years, most take 5. In his shop boy could learn horseshoeing; the work is welding, forging and shaping.

Blacksmiths would like to have a chance to attend a course of special training on business close to their own and would certainly attend. Takes "American Blacksmith." Business now requires much more skill than formerly, owing to increased wants of the manufacturing world. In some instances machinery has increased skill, in others it does away with it, e.g., when it replaces hand labor; now have to build machines to do work that used to be done by hand, but more skill is needed, as the work is of a heavier class, and it is necessary to know the nature of the metal, the stress it will stand, etc. No means of learning these things except by an occasional book, which gives a certain amount of information, but not enough. In order to be an efficient blacksmith, a man would need to have a thorough knowledge of arithmetic, freehand and mechanical drawing, a working knowledge of chemistry, and other things. Correspondence Schools presuppose public school education, and a man who has not that cannot understand the lessons, and terms used are harder to grasp than the lessons themselves. A night school teaching arithmetic applied to blacksmithing from the very beginning would be good; no man that has ambition and desire to learn would find it too hard to attend night school. Witness would be glad to teach a practical knowledge of his trade in night school.

Painters and Decorators. Witness went to Technical School in London, England, and got instruction in design and in combination of colors; lessons on analysis of colors; studied the nature of colors, and the scientific part of decorating, graining, sign writing, fresco work; found out the nature of every material used, and what it consisted of; the quantities that should be used for various colors. Boys jump into business and go along and don't get any idea of the nature of the material they are using, and they would not know what color to use for different rooms, facing north, south, east or west. They do what they are told but don't go any farther.

Arthur Stockall, foreman blacksmith, I.R.C. Got some special training while a young man; owes position to training received in Nova Scotia under Mr. Johnson, Superintendent, who used to take his boys and show them a locomotive with all its parts cut out of No. 12 plate iron, and give them a lesson every Friday afternoon with the locomotive in full action, explaining the various parts, their relation-

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ship and process of working. By means of a thermometer he showed the rise of temperature and the relationship of heat and coal in raising steam. Another thermometer showed superheating. Stockall took these lessons while a journeyman blacksmith at Windsor. Mr. Johnson turned out some of the best mechanics by that means. It would be a splendid thing for apprentices to learn the relationship of the different parts; they don't know after 3 years the relation of coal to steam raising and from his own experience, Stockall is satisfied that technical education is needed. The bent of the boy's mind should be found away back in the Public School, so that he can be trained in that direction. The foremen haven't time to teach the boys, with 16 or 17 apprentices and a large shop to attend to, and he is too exhausted to do so, even if he had time. When Stockall was a young man he sketched out problems at home, and figured out the best methods of constructing them, but it started with Mr. Johnson and when the time came for different work he was never at a loss. If a man has the disposition as well as the mental capacity well trained, he will be at home in special work when the time comes, especially if he can get someone to start him right.

David McGahey, in charge of a department of woodworking factory, Fredericton, took a bookkeeping course 10 years ago, and read technical journals.

Moses Mitchell, general builder, Fredericton, learned carpentering and also worked as a mason. Was never trained to read or make plans, but picked it up.

John O'Neill, foreman in wood-working, Fredericton. Had Manual Training half a day a week in Commercial School; also took Architectural Drawing course in International Correspondence School.

Denis T. Shea, plumber, Fredericton. Served apprenticeship in plumbing, 8 years altogether; read books of American Correspondence Schools, also trade journals.

Arthur L. Nicholls, Superintendent, Monarch Manufacturing Company, Fredericton, manufacturing acetylene generators and appliances. Studied in country school to 10 years of age; took International Correspondence Course; studied at night, Mechanical Drawing and Mathematics.

Andrew G. Downey, foreman, bottom finishing in a stove factory, Fredericton. Was a tanner and leather finisher; attended and taught night schools in New Brunswick.

Albert Smith, foundryman, Fredericton. Practical machinist; served regular apprenticeship for 4 years, beginning at 16; took part of International Correspondence Course in Mechanical Drawing.

W. Allen Staples, electrical engineer and contractor, Fredericton. Educated at St. John school, and went to Boston Technical 3½ years; went to night school in school of design at Lowell Institute.

Frank Furney, Sackville, N.B., foreman in Enterprise Foundry; served 3 years as moulder; worked as journeyman for 25 years; read Moulders' Journal.

John Ferguson, Sackville, N.B. Harnessmaker for 20 years; picked up the trade; no apprenticeship. Takes 3 years to learn the business.

Walter Appleton, Moncton. Assistant Superintendent of Motor Power I.R.C. Shops. Gained position by night study.

Charles W. Blakeney, Moncton, Machinist I.R.C. Had regular apprenticeship; no evening classes, but read up.

APPRENTICESHIP.

Competent labor is scarce in Chatham; not enough men learning the lumber trade. Nearly all skilled labor in Sussex is imported, chiefly from Ontario; I.R.C. shops in Moncton have more applications to be taken on as machinist apprentices than they can accept; 75 on waiting list. "Cotton factory employees were formerly brought from England; now our own people suffice." There is sometimes a dearth of labor in Woodstock; plenty of work for the industrious, but immigrants from Great Britain are not successful. Lack of labor increasing because of the call to the west.

A lumberman says no difficulty is experienced in getting skilled men for lumber trade "for this is a lumbering country;" on the other hand, he deplors the scarcity of common labor due to westward migration and the movement to manufacturing towns.

Skilled men are not plentiful in wire nail trade in St. John. One witness says that business in Canada cannot survive unless we have a large increase of skilled workers.

The efforts of skilled men are called for everywhere. Men acquire skill first by gaining knowledge and then by being set to see how that knowledge can be applied. Knowledge helps immensely in improving skill. Skill is rather blind without it. If men in any industrial pursuits attend the evening classes or take a Correspondence Course they will get a knowledge of theory, and in their work they will get practice, and put both together. While knowledge is power, skill—in the sense of applied knowledge—is knowledge raised to the fifth power.

For boys and girls who work at trades, drawing is a sort of universal language and Manual Training exercises should be in every Public School. Evening classes for special industry according to town or section should be held.

Boys might have school in employer's time for 2 or 3 hours in day time rather than night school. Witness favors half-time system on ground that boys would be too tired for night school.

Firms get apprentices locally; they learn in shops under journeymen; then go away and earn more than they might by staying. The chief difficulty is that apprentices change about; not bound to stay in one firm; 80% of boys leave before finishing apprentice period. Boys need practical men to teach them, often after the second year they go driving delivery waggons.

Boys are very unsettled, do not care for education or regular employment; it is easier for them to earn money now than formerly. No regular apprenticeship; boys come and go. No apprenticeship indentures now.

Young men should serve 4 or 5 years. If manufacturers were more far-sighted they would insist on having apprentices. In moulding shops in Sackville there is one apprentice to every 5 men—no regular instruction, but foremen and journeymen are supposed to look after apprentices. Witness advocates revival of strict apprentice system, and says he does not think boys would mind. Another considers apprenticeship preferable to night school for boys to learn work.

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Harness-maker states that it takes boys 3 years to learn business in shop. One witness thinks it easier than formerly to learn business in shop. Under old apprentice system men were more skilful.

Apprentice system in shops in Sussex, some boys have signed indentures, it is hoped others will. In blacksmith trade, boys start at 20 or sooner, but they are not bound and leave when they choose; paid from the start.

Printers' Union looks after its own apprentices, and has laws as to age, etc., and protection of employers and apprentices.

The Typographical Union has a superintendent in various parts of the country, and examinations for apprentices. In some shops foremen do instruct apprentices, but a compulsory night school would be desirable in addition.

Education is not enough, actual shop practice is a necessity. Apprentices do not appreciate personal lessons. Apprentices need Trade Magazine to read up. I.R.C. have special instructors. A good demonstration shop like New York Central is wanted. Apprentices should be encouraged by supplementary courses. Employers and labor unions should pay more attention to apprentices. Witness would give apprentices a bonus and certificate at the end of his time; would apply this system to all trades. Journeymen do not show apprentices; boss or foreman has not time, employer does not care. An apprentice has a poor chance to learn, too much menial work to do. Witness says it pays to keep operatives on one machine. Witness taught himself what he was allowed to learn as apprentice. There is too much specialization, owing to machinery, and boys fail to become mechanics. Boys do not get instructed in shops; men will not teach them for fear of losing jobs.

Apprentices, if they can go to night school, could be taken on at 14, otherwise not till 18. Most witnesses favor boys attending night school, one stating that in winter when business is slack boys could go to night school. Only one witness not in favor of night school for apprentices.

Mr. A. T. Sollows, Manufacturer of Neckwear, St. Johns, N.B., deals in a letter with the best way of procuring skilled labor and holding it in the vicinity. He thinks a large number of the manufacturers who employ young men and women in their factories do not favor education by technical schools for such classes of work, although they must have a common school education. He feels that the branches of education varied to meet the requirements of the different enterprises of the city could not be put in. Therefore, in such cases as box factories, cotton mills, clothing and fur factories, novelties, carpenters, plumbers, masons, stonecutters, and a number of other trades, he suggests that the Government issue certificates for the firms employing apprentices and that a bonus be given to each individual who will sign a certificate to learn the trade which he or she is inclined to learn, the term of years of learning such trade being stipulated in the certificate, and that, at the end of the term, the Government provide a diploma, with the manufacturer's certificate of the term he or she may have served with recommendations attached.

The bonus idea is simply this: at present the manufacturers in such branches as above mentioned advertise for help, and in nine cases out of ten the classes who respond are ignorant of their work. The manufacturers cannot afford to pay

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wages that would be encouraging to employees who feel that they can earn more at other classes of labor which are not staple. In this way they go on till in the end they know nothing, and are of no service to a manufacturer in the matter of skilled labor. The suggested bonus to such apprentices may induce them to stay their out term, knowing they will receive something, viz. the bonus and diploma, signifying a well-learned trade.

The writer thinks this suggestion will be beneficial to the city, the Dominion of Canada, and the employees at large, and also that it will provide more skilled labor in the different branches of manufacture.

CHAPTER XX: AS TO AGRICULTURE.

SECTION 1: WORK OF DEPARTMENT OF AGRICULTURE.

The Department of Agriculture is under the management of a member of the Government who is termed Commissioner for Agriculture. The Commissioner has the same rank and status as a Minister of Agriculture in other Provinces. Special funds are granted by the Legislature for this Department, the appropriation for 1910 having totalled \$53,815.00. Practically all the work of the Department is educational.

The work of the Department of Agriculture covers the following:—

1. Administration of the work of 90 Agricultural Societies:
 - Improvement of stock.
 - Improvement of seeds.
 - Buying of fertilizers.
 - Holding of exhibitions.
2. Encouragement of Dairying:
 - Two Dairy Superintendents.
 - Dairy School.
3. Encouragement of Horticulture:
 - Provincial Horticulturist.
 - Illustration Orchards, Orchard meetings.
4. Encouragement of Stockraising:
 - Importations.
 - Assistance to importers.
5. Extension of Markets:
 - Assistance to open up Cuban markets by provision of warehouses at St. John and Havana.
6. Farmers' Institute and Educational Work:
 - Speakers sent to meetings.
 - Judges and speakers to local exhibitions.
 - Assistance given the Provincial Farmers' and Dairymen's Association to hold general gatherings of farmers and to obtain good authorities for such meetings.

Grants are made to Agricultural Societies for the improvement of live stock which they import for their members; for the buying of seed in wholesale quantities and selling at cost to their members; for holding exhibitions, etc. The Department has in some cases made direct importations of live stock and sold them at auction. This year the policy is to secure individual importers to import and sell stock, the Government paying their expenses on arrival and advertising the sales, finding auctioneers and looking up customers, but not giving any actual bonus. The Government has inspection of such stock.

Latterly not so much has been done in bonusing cheese and butter factories as formerly, only three small bonuses being given in 1910; but two Dairy Superintendents devoted their whole time to addressing meetings of farmers, testing milk and cream for the factories, inspecting cheese and butter, and generally trying to help the factories and dairy farmers. One of the Superintendents at the request of the St. John Board of Health examined the dairies from which milk was sent to St. John and gave certificates.

Some years ago the Government arranged with a company of farmers at Sussex, for the use of their building and machinery for Dairy School purposes and during March and April a Dairy School is conducted, the students having the benefit of the manufacturing operations carried on by the Dairy Company during the school term. This Dairy School was started by the Dominion Department of Agriculture and was taken over by the Province six years afterwards. Those who attended are chiefly buttermakers and cheesemakers in factories. Special courses were put on for boys and girls, but these have not been attended in large numbers.

In 1909 the Government at the request of the Fruit Growers' Association appointed the Provincial Horticulturist and appropriated \$2,500 for the encouragement of horticulture. Meetings and orchard demonstrations have been held throughout the Province.

ILLUSTRATION ORCHARDS.

Some years previously the Government had established a number of illustration orchards, making a contract with applicants in different sections for planting one or two acres of young trees which were cared for by the Department so as to test the suitability of varieties to different localities and demonstrate what the best orchard practice would do in apple and plum growing. There has been quite a general planting of new stock, the greatest drawback being that varieties are selected in a haphazard way and a good deal of the stock supplied is not fit to plant, there being no Government supervision of nursery stock. Neither of the two nurseries has been conducted with very much development and there appears to be a very great need in this direction. Trees are very healthy and productive in this Province.

The Department accepts not more than two applications for any locality for setting out not less than one acre. The owner prepares it in the previous season by thorough cultivation; the Department supplies trees and furnishes a man to oversee the planting, the owner supplies labor and agrees to care for the orchard for ten years as instructed by the Commissioner for Agriculture, all products being the property of the owner.

Directions are given for planting, for cultivation once a week, cultivation to be continued till about 10th July; then to be seeded with clover, which is to grow till frost kills it; ploughing in spring. Before frost comes, trunks to be wrapped; a dressing of manure to be given once in 2 years at least and worked in with cultivator. Spraying is to be practised intelligently and regularly. So far, but little thorough work in spraying has been done, and much damage has resulted, which might have been avoided by systematic spraying. Detailed directions

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are given for spraying every variety of fruit and vegetable, also for thinning trees for profit.

FARMERS' MEETINGS.

The Farmers' Institute System, as it exists in Ontario, could not be worked in New Brunswick for several reasons, so that the name Institute was dropped and an effort has been made to obtain the same results from the Agricultural Societies by sending them speakers. Last year there were 128 meetings at different seasons, the average attendance in the fall being 43 farmers and their wives and the summer attendance being 82. The orchard meetings were held in the orchards themselves, but no meetings were held on farms where crop competitions were carried on.

REPORT OF PROVINCIAL AGRICULTURAL COMMISSION.

The Government appointed a Commission to investigate agricultural conditions.

The report of the Agricultural Commission, points out that the methods of agriculture generally in vogue in the Province, the small returns, the lack of live stock and the absence of intelligent interest on the part of the growing rural population in the opportunities about them, show an urgent need for some change in our educational system, so that country children may get some information on what is to be their life work. This is the only way to check the stream towards the cities. The rural children of New Brunswick need this instruction as much as any, but the first essential is that teachers should be trained to give the instruction. More provision should be made in the Normal School for this training, and teachers should pledge themselves to teach three years in the Province before leaving. Nature Study of a practical and homely kind in the Public School should be followed by agricultural teaching in the High School, or, better still, special schools in every county. A Technical School for Agriculture is imperative where three-fourths of the population will pursue that calling, and an Agricultural College is not adequate to the needs of more than 5% at most of the farm people; the rest require less advanced training, which would enable them to take better advantage of the educational aids they have, including the College. New Brunswick now uses three first-class agricultural colleges in other Provinces for its students, and the Provincial Government pays the transportation expenses of the students. Students can use these colleges at less cost to New Brunswick than if one were established in New Brunswick. The time is coming, however, when New Brunswick boys will be crowded out of these colleges, and preparations should be made in anticipation of this.

The Normal School should be extended in the direction of centralizing University, Normal and Agricultural instruction, so that teachers could be utilized in each department, thus saving the expense of two staffs. Short Winter Courses are most beneficial to older farmers, and these should be held at Fredericton.

Short courses in a modified form, especially in dairying and poultry, could be held at local centres. A poultry demonstration plant might be started. Poultry raising and pure bred dairy stock on the Provincial Hospital Farm might be of educational value and assist in supplying the demand, in addition to the needs of the Hospital.

A Provincial Horticulturist is needed, to develop land for the proposed Normal School extension and promote horticultural and fruit growing in the Province at the short courses and Normal or College courses. This man might combine the supervision of Illustration Orchards, etc., with his duties.

Travelling Instructors in Dairy and Live Stock would be of great advantage, as the farmers who most need the instruction are the most difficult to reach.

Agricultural journals are a great factor in agricultural education, and agricultural societies should see that all their members take them. A library of standard books should be collected.

The conditions of agricultural credit in New Brunswick are not favorable to the farmer who needs small amounts for short periods. A co-operative credit system should be started. Co-operation in buying and selling would also be most beneficial.

Illustration Farms conducted by the farmers themselves, from which records could be made public and people invited to examine for themselves, would be very helpful, results reached by Government Institutions being not very well heeded by farmers, who say that the Government with money behind them can do what ordinary farmers cannot. These Illustration Farms could be used to put into effect the results of research work done at the Government farms and, if situated near a High School or Consolidated School, could be made of great use.

SECTION 2: INFORMATION OBTAINED FROM Mr. W. W. HUBBARD, SECRETARY FOR AGRICULTURE.

School Gardens have done great good, particularly in the case of the Kingston School, in inducing a considerable number of young men to pay particular attention to agriculture and pursue their studies at agricultural colleges; and already farmers are taking more intelligent interest in agricultural training and there has been a decided change in the attitude of farmers in the Province as a whole, Institute speakers receiving more intelligent appreciation. The work already done among farmers is having decidedly good effect and should increase in greater ratio in future.

Last year 40 young men from New Brunswick attended agricultural colleges outside the Province; 27 went to Truro, N.S., the Government paying their railway fare both ways, so that New Brunswick students have an additional advantage over those who have to travel any distance within their own Province; 10 students went to Macdonald College, Que.; 3 attended at Guelph, Ont.

If New Brunswick had equipment for short courses equal to that of Truro, N.S. no doubt a large class could be worked up; but the college at Truro is very willing

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that New Brunswick should send all the students it can and undertakes to put on a special course for these students if the number is sufficient to make it worth while. As there is practically no difference in conditions between the two Provinces in the matter of live stock the course at Truro, N.S., would be equally suitable to New Brunswick. When the number of short course students at Truro reaches 300, as Mr. Hubbard thought it would, it would be desirable to establish such courses in his Province.

As to getting up a fair attendance in the afternoons or evenings at central schools with an Illustration Farm alongside, Mr. Hubbard thought farmers could be gathered in the summer evenings from five to six o'clock onwards, and that there was no real reason why farmers should not attend from five to eight except the matter of distance from the centre; but there is always a disinclination among men who have worked hard all day to work still further at night. If they could be made to think it was an entertainment it would be different. He thought courses on summer evenings for two hours twice a week would be generally supported if properly worked up and held at convenient places. Even if only ten men attended it would be a good use of money, as ten men interested in each locality would have a perpetual influence.

It would be economical and feasible and also add to the interest if there was a Summer School for teachers at centres and classes at the same place for farmers on agriculture, thus identifying the two; and if there was a school garden there it would interest the farmers in school studies and work. The Department would be sympathetic and co-operate towards anything of that kind.

Farming has improved in some sections, but the great lack is live stock, and there has been improvement throughout the Province generally in that regard. The output of cheese and butter factories since 1903, the largest year on record, has fallen off considerably; but the introduction of the hand separator has led people to take care of the cream at their farms, make butter, and feed the skim milk to calves and pigs instead of sending the whole milk to the factory as formerly. At one time the supply of beef brought considerable profit but this has shrunk to a negligible quantity.

Students go to Truro, N.S., by the Intercolonial Railway and Mr. Hubbard thought it would be very nice if the Government would carry the students free; it would certainly stimulate the Provincial Government's efforts to get more students, as the money now expended on fares could be devoted to canvassing. He thought it would be a good policy for all the railways to help whatever tends to increase traffic for them through increased production. The Department had always had the sympathy and very often the help of the C.P.R. in any of their efforts but the Inter-Colonial had been hard to approach, having definite, set rules and not being able to do anything without getting special authority.

The New Brunswick Government has been contributing an Instructor for the full Dairy Course since the Agricultural College started in Truro, but that is the only contribution it has made. The generosity of the Nova Scotia Government might be pointed out as an example for the Dominion Government to follow, though New Brunswick had Provincial pride and did not wish to ask for alms.

One reason for the falling off in the live stock and dairy business is the great scarcity of labor, the trek of the young men to the west and particularly the very bad effect of the harvest excursions, against which protests have been made by the Department for the last two or three years. In some cases men have gone from New Brunswick leaving their crops in the ground for some one else to harvest, and they have never been harvested, and these men returned much poorer than ever by reason of the waste on their own farms.

Many farmers are now paying \$30 or \$40 per month for labor and in some cases cannot get it, and the harvests are suffering to-day from lack of labor. Mr. Hubbard thought that the harvest excursion plan should be reciprocal, and that there should be a \$10 fare from the West to the East, which was suffering as much as the West from want of labor. Diversified farming with employment all the year round would help to induce a reasonable measure of immigration. No doubt reports from these Illustration Farms would be good immigration literature. The climate and prospects of New Brunswick are not well known abroad compared with the attractions of the West, as adequate means have never been taken to advertise.

The Department requests students who have attended the Truro Agricultural College to send in their impressions as to the benefits received and also suggestions for the improvement of agriculture in New Brunswick. These letters contain many helpful hints and tend to increase the efficiency of the work of the Department.

SECTION 3: EXTRACTS FROM LETTERS OF STUDENTS WHO ATTENDED THE SHORT COURSE AT TRURO, N. S.

T. H. Manser, Aroostook Junction, Victoria Co.

I was much pleased with the course and only regretted that more from these upper counties were not present to take advantage of it. I think the majority of farmers here are making a mistake selling so much low material off the farm. I have gone quite largely into potatoes, which are a very risky crop. The greatest difficulty farmers have to contend with is the scarcity and high price of labor. I have never tried foreigners as they would not understand our conditions and would not suit me, as I only need one permanent man. I have dropped dairying since the factory failed in Ondors, as it is impossible to get indoor help. Many have gone into potatoes, and are buying large quantities of expensive commercial fertilizers which this year will take the whole crop, and in many cases more, to pay for them. It might be a help if we could get a factory started on the cream gathering system as it was done in Woodstock the past season. It would be a good thing if you could send Mr. Moore through the country districts here on the seed question and it is a question which every farmer here is interested in. We received instructions at Truro which proved the great advantage of grading up and using the very best seed. This year I intend planting only large potatoes of good shape.

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Wm. McDougall, East Glasville, Carleton Co.

I think the college at Truro is a great help to the young men who attend, as it gives a course of instruction which he cannot get at home, and he can also get practical information there that he can make use of on his farm. Farming would pay better if the farmers would adopt more modern ideas and get out of the old rut. The difficulties the farmers here have to contend with are the cost of transportation, the charges of the "Middle Men," and the scarcity of farm help at certain seasons of the year. If more settlers could be induced to take up the vacant farms in Aberdeen it would help the situation.

Rev. J. S. Gregg, Young's Cove, Queens Co.:—I was able to spend one week at Truro. I enjoyed the classes very much. Already I believe an interest has been awakened in agricultural interests within my parish. I am well satisfied that these short courses are better than anything yet undertaken for young farmers. I am sending a letter to-day to Wesleyan Church Paper, Halifax, N.S.

Clarence Robinson, East Glasville, Carleton Co.

I think the college at Truro gives a good course of instruction for the young men, and older ones too, who intend to farm, as we get practical information there that we cannot get at home. The principal difficulty farmers have to contend with is the cost of transportation to markets.

W. H. Starkey, Starkeys, Queens Co.:—I took in all of the courses and thought they were all right, as I think that every farmer should have a little of that kind of live stock and raise a lot of turnips, grain, potatoes and corn. I have a silo built and have been growing corn two years, and find it a great saving on hay, and also it seems to be good for all kinds of stock. Our land is lacking of humus and I think we will have to get growing clover and plough it under and try and build up the soil. I also think we should grow more green stuff for our cows to feed on after grass gets short. I think we should keep more pigs, also haul in lots of black muck or marsh mud and all of the rough stuff we can find. In the woods we gather leaves which we find a splendid thing. We have to get to work at something soon or else get out or starve, and stop buying so much feed from the West.

Henry Kirtley, Welsford, Queens Co., N.B.:—At the short course I spent a very profitable time. I received valuable information in regard to farming in general, and feel amply repaid for my trip. Dairying is my first aim, raising as much pork as I can profitably handle. I think a great deal of the farmer's difficulties rest with the farmer himself. If the farmer would give a little more careful study to his work, carry on a more systematic rotation on his land, more intensive cultivation, and keep only the best animals that can be had to suit his needs, I do not see what is to prevent him from getting a comfortable living.

J. H. McCrea, Shannon, Queens Co.:—The course I attended is a grand institution. I am very sorry New Brunswick has not a similar school to educate the farmers. While I must commend the Government for the steps they are taking to encourage farming, I think we should have just such a school in N.B., for greater interest would then be taken. Of the 40 long course students I learned that only one was from New Brunswick; I think that is a very small per cent.

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One of the difficulties we N.B. farmers have to contend with, (I can only speak for myself) is the production of a sufficient quantity of hay on high-land farms. I would not consider it any trouble to farm if I could have one head of cattle for every two acres of land I possess, which is what they told us at the College was necessary. This difficulty can be overcome, to a certain extent, by the growing of roots in large quantities, or corn if it could reach a state of maturity.

Harry C. Cochrane, Bloomfield Station, Kings Co.:—I liked the course fine; think it is just the thing for the farmers of the Maritime Provinces but I don't think it is advertised nearly enough; it ought to be advertised in the daily papers a while before it opens, for the majority of farmers know nothing about it. The chief difficulty of farming here, I think, is that the majority of farmers do not know enough about scientific farming.

G. F. Flewelling, Perrys Point, Kings Co.:—I would like stock raising better than any other branch of farming, and it is the branch of farming that is most needed in the Maritime Provinces in my idea. There is certainly on the average a very poor lot of live stock. I think most of the difficulties of farming lie with the farmers themselves. Most of them, instead of trying to help their neighbors or learning something from them, are finding fault with everything they do, whether it be good or bad, or whether it be on the farm or in the school, church or other affairs. It would be wiser for farmers to drop this method and co-operate more, by forming agricultural societies or by clubbing together and buying some improved machinery which would save labor and do the work quicker and better. One man I met at Truro was getting up courage to go back, as he knew he would be the laughing stock of his neighborhood when he got home; he said that he had almost to skip out at night to get clear, for the people around thought it an awful thing to go to a college to learn how to farm. "Why, anybody can farm." I think the farmer should have as good an education as anybody, especially in bookkeeping, so that he can keep an exact account and tell just where he stands. Ask a business man what each branch of his business is doing, and which is doing the best, and he can tell you exactly where he stands by looking at his books. Ask a farmer where he stands or what he is doing and he has no idea. This is where the business man gets ahead of him. I think that great stress should be laid upon education of the future farmers. Again, the business men work together, and know what each other are doing, while the farmers try to keep what they are doing to themselves. Thus it is that business men are so much more wealthy than farmers, as they see what others are doing and the advantage of improvements that may come out. Until the farmers see their folly and try to change their ways, I don't think they will get along as well as they might.

Ours is rather a poor and rough part of the Province for farming, but still I think the farmers could do better if they only go about it in the right way.

The course at Truro was everything one could look for. It was practical, and every branch was carried on so that one could not help receiving a great deal of benefit from it. It was certainly a fine course, and I really do feel sorry for those unfortunate enough to miss it.

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H. Allen Dickson, Jubilee, Kings Co.:—I consider the course at the Truro College a great benefit for the length of time spent there, and if more farmers would take advantage of it they would find it a great benefit. The principal difficulty our farmers have to contend with is need of better knowledge of the fertility of the soil and management of the dairy herd.

W. P. Fowler, Hammond Vale, Kings Co.:—The course of instruction at the Truro College would be hard to beat. It has been of great benefit to me, so much that if possible I intend taking the full course beginning next fall. The time was so short that the instructors could only hit the high places, so to speak. The courtesy and attention which the short course men received at the hands of Prof. Cumming and his staff were boundless. I propose to farm mainly to beef and draught horses. I believe there is more money in dairy cattle if one is in close touch with a cheese factory and creamery, but as I am not so situated, I will have to do the next best thing. I should like to keep sheep, but on account of the number of dogs it is impossible here. Some of my neighbors do, and every year they lose a good percentage of lambs and ewes. I consider weeds, the greater part of which we import from Ontario in clover and grass seed, to be one of the greatest drawbacks to our New Brunswick farmers. Also from what I have seen I believe the majority of our farmers do not know how to care for and feed live stock correctly; I did not before I went to Truro. If the other fellows know, there are mighty few of them that practise their knowledge. I should think that these and all other troubles which we farmers have in N.B. could be overcome by our Department getting busy and starting a College and Farm on lines similar to those at Truro. I think that the move would be backed by every farmer with brains in the Province.

W. G. Campbell, Salisbury, West. Co.:—The course at Truro is just the thing that we farmers want. It gives a man a chance to see improved methods and get new ideas, and it impresses a man with the importance of more thorough work in all lines of farming. I intend to raise some new turnips, clover and grain-feed, the latter to be fed in August and September and improve the dairy herd. The chief difficulties in farming here are lack of knowledge and lack of interest, and not taking good care of our stock, especially the cow. I think it would be well to advertise the College at Truro more, for once a man goes there he will take more interest in his work of farming.

Edgar G. Eagles, Monteagle, West. Co.:—I found the short courses at Truro very helpful, and it is what every farmer should attend if possible. My intention is to follow dairying and keeping pigs. I also will keep some sheep, and intend to raise quite an amount of green feed to keep up the flow of milk when the pastures get short, and turnips to feed through the winter, and also raise more clover, hay, and feed all the crop on the farm in order to build up the farm. As to difficulties, I think a great many of our farmers are not interested in agriculture, and carry on too many side lines, do not keep records of their cows, do not know which ones pay and which do not. I think a farmer should keep a record of all his work the same as a business man. One great difficulty is that our farmers will use a scrub bull in their herds because they think it cheaper than a pure-bred.

I think there could be some lectures given to farmers to stir up interest so they will see the necessity of attending the short courses at Truro.

Lee Tingley, Moncton:—The course of instruction I attended was principally in live stock, and I got an insight on many points, especially in regard to the dairy cow, one of the most essential things in New Brunswick. I think a few pure bred cows in each district would help farmers to work into a better lot of stock, as we now have mostly a mixed class of cattle of a general purpose type.

Joseph W. Steeves, Lower Coverdale, Albert Co.:—The course held at Truro was as beneficial as could be expected. I think the cattle judging was very instructive. My intention is to raise beef cattle. We also have a good chance for fruit growing. I do not think that our farmers have many difficulties here. The chief fault is in the people; they are not up to modern agriculture. A great difficulty in farming is the in cost of labor.

SECTION 4: OTHER TESTIMONY AS TO DAIRYING.

Sussex in the chief centre of the dairying interests, and the co-operative dairy there is working very satisfactorily, nearly all the farmers taking milk and cream to the factory. There is co-operation in the sale of milk. The Sussex Milk Factory is managed entirely by farmers. There is a voluntary board comprising a president, vice president and twelve directors who employ a secretary and manager and butter makers, profits being divided according to the percentage of butter fat in the cream. The separator has largely changed the work of the factory. The farmers, with the exception of fifteen, use hand separators and bring in the cream two or three times a week; several patrons bring in milk. This is an advantage to the farmer because the skim milk is fed warm to the calves and pigs as soon as separated, and these animals increase very much in consequence.

There are about forty cheese factories and creameries in New Brunswick, the majority being in King's County, where about 70% of the butter is made.

There is a growing idea that dairymen must apply themselves scientifically, that there must be intelligence at the work, in order to make the most out of their labor. In some cases there is not the active help the inspectors would like in the way of the younger generation setting to improve themselves.

During the season of 1910, twenty-two attended the dairy school. The courses consist of instruction in butter making, cheesemaking, handling of cream separators, milk testing, both for butter fat and instruction in handling power separators, also the special lines of farm dairy work which take up butter making and cheesemaking. There are two separate courses that run about a month in the spring and some students take both. These courses are longer than the short dairy course in Truro, and, while the staff here is not as complete as at Truro, they can give more practical instruction. The equipment and live stock are limited in Sussex as compared with Truro.

In the fall of 1909 Inspector MacDougall took up experimental work in rural schools and found it worked well. He arranged two circuits, one of nine schools and one of ten schools, to be visited in a week, teaching such ideas as boys and girls should know. He started out with the idea of allowing all boys and girls in grade 3

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to leave the classroom during the lectures, but he found some who would not miss them for anything even though they did not understand all that was said. In some districts even the small boys and girls would answer questions relating to the preceding lecture, and also ask some quite difficult questions; in other districts very little could be got out of them and one would think the parents had never discussed general dairying or farm knowledge. It is the intention of the Government to continue this work. Even those boys and girls could locate trouble at home, when there was trouble at the factory, because of ideas which were discussed at those lectures; in that respect they would be of the greatest assistance. Under Mr. MacDougall's instruction boys and girls would bring in samples of milk, prepare the sample and ascertain the butter fat in it. Unless the hand separator is handled properly it may mean the losing of a lot of milk in the course of a year, but by the simple test given in the lectures the children can ascertain whether the separator is operating correctly or not. The lectures have been arranged so that the scholars can connect them with the work at home and, thus school and home re-act upon each other.

The dairy lectures for rural students as given by Inspector MacDougall cover the following:—

(1) MILK—composition, with sample of each constituent and its function in building and maintaining the body; demand for clean milk and results of unclean milk; study of sources of objectionable infection.

(2) BABCOCK TEST FOR BUTTER FAT—demonstration of samples of milk and cream brought in by students; principle of test; sample of churned cream and of melted butter in over run test tubes; use of Babcock test, (a) in herd improvement, (b) in ascertaining losses in skim milk and buttermilk, (c) in teaching boys and girls importance of accuracy and method.

(3) CREAM AND BUTTER—essentials in production of good cream; skimming by gravity or centrifugal methods; conditions contributing to thorough skimming; ripening of cream; factors which influence the churnability of cream; what is good butter?

(4) THE DAIRY COW AND HER FEED—origin of dairy breeds; difference in amount of butter fat on same feed; how to find the unprofitable cow; some cow records; conditions favorable to money making; feeds suitable for milk production; profits from feed above maintenance rations; growth of legumes, clover, alfalfa, etc., inspection of clover and alfalfa roots in alcohol showing nodules formed by nitrogen-gathering bacteria.

(5) THE DAIRYMAN—achievements of the reading, thinking dairyman; need for head, hand and heart work; dairying in economical agriculture; use of good agricultural papers, cheese factory and creamery statements; what to observe and how to help at home.

SECTION 5: OTHER TESTIMONY AS TO POTATO CULTURE

Potatoes constitute an important crop in New Brunswick. One witness in Fredericton who was an extensive potato grower gave some interesting testimony. In a good year he said he averaged 100 barrels to an acre with three bushels to a

barrel; that is a large crop. On drained land he had been able to increase his crops very much, having obtained as high as 200 barrels. He believed he could increase his crop with the short rotation—potatoes, hay and oats; it would suit well to have the hay for feeding cows. He did not know that he would call manure very valuable for potatoes, as he thought them more likely to rot if grown in manure than grown with fertiliser; that is the impression of men who have made a specialty of potato growing, and who have always employed manure.

At present there is no one local market for potatoes. The price for the early potato is \$2 in St. John, and \$1.80 in Fredericton. 50 barrels would be about the average crop of early potatoes, but that has nothing to do with the Fall potato. He had never found an early potato that was prolific; but the Irish Cobbler, which is our earliest marketable potato, has been developed by selection by George Fawcett of Sackville who had shown witness a very big hill that must have had 14 of those potatoes got from 3rd year selection, whereas a number of hills not selected showed only perhaps 5. After that visit witness determined to do some selection of the potatoes for planting.

Farmers had visited witness from quite a distance to see his method of growing potatoes, especially because the tops remained green so very long. There were two reasons for this. Bordeaux mixture kept the early blight off, then cultivation kept them growing. Many farmers have copied those two methods and have doubled their acreage in four years, although not following the rotation. Witness could see a marked improvement all over New Brunswick in growing potatoes.

Mr. Clements said it was hard to strike an average of price per barrel for potatoes, because he had just entered a new market. Up to the Spring of 1910 he believed the average price for a barrel of potatoes in New Brunswick had been worked out at average for 11 years of 97c. at the shipping point, so a good average crop of 100 barrels to the acre would give \$97, which leaves a big profit and the land is being improved. There is an unlimited demand for the product, and New Brunswick is getting the best name for potatoes.

There is no educated labor to be had, for a \$1 or \$1.50 man takes a trade or profession, or else he is a farmer himself. Mr. Clements' trouble was that he could not get a foreman, though he could afford to pay one just as well as a manufacturer could, and he would be prepared to give work the year round if he could get the right quality of man. Trained people were wanted. He believed boys of 16 or 17 would be of more value in taking care of potatoes if they had school garden training. He looked upon our schools at present as thought-producing factories which produce thought by processes that do not turn to agriculture, hence the schools make professional and not agricultural men. He believed it possible to train scholars in such a way and with such material that they would love the farm. He thought there was unlimited chance for a man to employ his talent in the management of crops and in leadership in his locality. At present no trade was so poorly worked as the agricultural trade.

A sample of what might be done is to be seen in what the great Burbank has done and in what young George Fawcett is doing down in Sackville. Fawcett took a couple of \$700 farms such as may be seen around our back settlements with wire grass showing all through, and this year he has 25 acres of potatoes and has

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the oat plot divided into sections with samples of seed he is going to pick and choose from.

Witness had never had time to take a course in an Agricultural College, and got all his experience from working with the land himself. Mr. Faycett on the other hand is a graduate of an Agricultural College.

Witness had met young men that had attended the Truro College the last two or three years and could see the improvement in them. They certainly taught him some things in the line of experiments that they had been able to work out; and for the things that he had found correct they had been able to give reasons why they were correct. He would call that the big part of farming—knowing the cause—his own trouble was that he could find out a thing but did not know the cause, and had to grope his way more or less.

CHAPTER XXI: TESTIMONY AS TO FISHERIES.

We possess a great many things now which should be used by fishermen but which they cannot use for lack of scientific training. Every fishing fleet should have at least one wireless telegraphic apparatus and one person skilled in that particular line; also a submarine telephone so that in fogs they may find each other and find the harbour-mouths and guide themselves in that way, lights and other means of guidance being of little use at such times. The value of this for the protection of life would be immense.

Another department in which science is not quite ready to serve the fishermen, because so little work has been done, is as to movement and habits of fish. We know little about the cultivation of the plankton in the upper layer of the sea which produces as much food as an acre of meadow, and how we might improve its cultivation just as we improve varieties of our grains and grasses. Scientific men have devoted themselves in England without remuneration to that problem for the English coast, and there are great possibilities for that in the future everywhere.

Technical Education is desirable for fishermen. Biological schools are doing something for them, but not enough. Training is needed for fishing. Shad fishing which was formerly important, is now declining. Oyster beds need supervision. There is great waste in the herring fishery; the Scotch system of control would check this. Much wanton destruction is caused by sportsmen and others, and laws to prevent waste should be enacted. If the young people were trained, it would be a good means of insuring the stability of the industry and the development of natural resources. There is a lack of trained men, especially in curing and treating fish.

If the men engaged in the oyster business could be convinced of the necessity of conserving the beds and treating them properly, it would be more to their advantage. It would be valuable to have instructors who could show by charts how other nations have made a great harvest of wealth and protected their oyster beds.

The herring fishing, too, would profit by better organization and some instruction. Instruction should be given on the variety and value of food fishes of this country, particularly the smelt industry, the Cohauk, clam and herring fishery. How to properly cure fish and also how to care for salmon and trout should be taught. The export from fisheries amounted to \$800,000 last year.

Fishermen cure their fish as their forefathers did; quite a lot of fish are dried. Barrels should be standardized; the season for oyster fishing and for smelt fishing should be shortened. Lobsters are getting smaller all the time and something should be done to protect them.

CHAPTER XXII: TESTIMONY AS TO LUMBERING.

Lumbermen ought to have instruction regarding damming streams and putting sawdust and mill refuse in the streams; they seem to think the streams belong to them for getting out their logs and shipping their lumber and they have no regard for the settler or the rights of the riparian owner. There should be education and regulations to prevent that. Lumbermen should also have technical instruction in regard to the pruning of trees and the taking out of matured trees so that there would always be an incoming crop.

One lumberman said the annual growth was renewing the timber throughout his area and another testified that his timber area produced as much as ten years ago and the percentage of waste was less. The tops of trees were now largely used for boxes; fine saws were used in the mills, thus avoiding waste in the form of sawdust and laths were cut out of the small pieces. Formerly lumbermen were content to get one log out of a tree, leaving three or four feet on the stump, but now trees are cut close to the ground. Regulations in regard to fire wardens are helping to prevent fires.

There is not much educational help for the men who go to the woods in the winter time. Forestry courses will assist lumbermen to get the kind of men needed, but they will have to be associated with wood-managers who have practical knowledge, though the latter are not a great deal of good without scientific training. The difficulty is to get men who know and who can also manage. Men who have charge of machinery would be better for technical education.

If boys had one or two years of technical training it would help them to be better axe-men, mill-men, etc., but men must have practice to become really proficient. The disadvantage was in the fact that the manufacturing of lumber was not carried to its higher stages. Manual Training might help in that direction so that the lumber might be sent out in a still more finished stage. A lumber company's employees would be glad to attend night schools and indeed many of them now take Correspondence Courses, but would prefer personal teacher with practical experience. The Correspondence Courses were very beneficial to young men.

Cutting spruce for firewood and then replanting it would pay, and the Government could get a revenue for educational purposes from this source in perpetuity.

QUEBEC.

CHAPTER XXIII: OUTLINE OF THE EDUCATIONAL SYSTEM.

SECTION 1: INTRODUCTORY.

The Council of Public Instruction in the Province of Quebec consists of Roman Catholic and Protestant members, appointed by the Lieutenant Governor in Council during pleasure. The expenses of the Council are met out of funds voted for that purpose by the Legislature. In the performance of its duties the Council is subject to the Lieutenant Governor in Council.

The Council is divided into two committees, one composed of Roman Catholic members, and the other of the Protestant members. Each Committee sits separately, appoints its chairman and secretary, and makes regulations for the organization, administration and discipline of Public Schools under its jurisdiction. The former deals with all school questions in the Province affecting the interests of Roman Catholics, and the latter with questions affecting the interests of Protestants.

The Roman Catholic Committee consists of: (a) The bishops, ordinaries or administrators of the Roman Catholic dioceses and apostolic vicariates, situated either wholly or partly in the Province, who are members *ex officio*; (b) an equal number of Roman Catholic laymen appointed by the Lieutenant Governor in Council during pleasure. (c) The Lieutenant Governor in Council may add to the said committee four officers of instruction, two of whom, being priests, shall be principals of Normal Schools in the Province, and two of whom shall be laymen, officers of primary instruction; such appointment being made for a term not exceeding three years.

The Protestant Committee consists of: (a) A number of Protestant members, equal to the number of Roman Catholic lay members, and appointed by the Lieutenant Governor in Council during pleasure. (b) The Protestant Committee may associate with themselves six persons, as associate members; and the Provincial Association of Protestant Teachers may, each year, at their annual meeting, elect one of their members to be an associate member of the Protestant Committee, for the following year. (c) The persons so added shall not form part of the Council of Public Instruction, but shall have, in the Protestant Committee, the same powers as the members of such Committee.

School questions affecting the joint interests of both Roman Catholic and Protestants, are under the jurisdiction of, and are decided by, the entire Council of Public Instruction. The two Secretaries of the Department of Public Instruction are joint Secretaries of this Council.

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The Superintendent of Public Instruction is President of the Council. The following figures are taken from the report of the Superintendent of Public Instruction for 1910-11:—

Elementary schools.	Roman Catholic	Protestant
Total number of schools under control of Commissioners and Trustees.....	4,906	947
Number of independent schools.....	48	4
Total number of pupils.....	*190,471	†35,967
Percentage of average attendance.....	74.30	71.29
Number of male lay teachers with diplomas.....	29	45
Number of male lay teachers without diplomas.....	12	
Number of female lay teachers with diplomas.....	4,363	881
Number of female lay teachers without diplomas....	724	421
Total lay teachers, male and female.....	5,128	1,351
Number of teachers in Orders (males 112, nuns 542)	654	1

*Of these, 509 were Protestants.

†Of these 1,644 were Roman Catholics.

SECTION 2: INFORMATION OBTAINED FROM HON. BOUCHER DE LABRUÈRE, SUPERINTENDENT OF PUBLIC INSTRUCTION.

In 1910-11 the number of schools, including universities, classical colleges and special schools, was 6,934, with a staff of 14,597 teachers, of whom 8,532 were male and female lay teachers, and 6,065 teachers in religious orders. The female lay teachers numbered 7,384.

The Classical Colleges are independent and do not come under the control of the Department. The Public Schools are maintained by the ratepayers of the municipalities. There are also grants from the Provincial Treasury for the Public Schools; these have been increasing a great deal.

The number of pupils is increasing every year; 410,000 pupils are now attending schools of every category. We have not compulsory attendance at school in this province. We have no law permitting any municipality to make attendance compulsory within its own boundaries. The School Commissioners in Montreal would not have the power to require attendance at schools. Generally people are not negligent. There is a very general interest in education. I think a large proportion of the children in all the districts go to school. There is not a large class in the country districts that cannot read or write. We have made great progress in the last 25 years. We have a good school system.

DRAWING AND TECHNICAL TRAINING.

Drawing is now taught in the schools, so that the elementary schools would give the necessary preparation for the technical schools.

Technical schools are provided in Montreal and Quebec. This is only a beginning. When those technical schools are running there will not be any need for modifying the course of study in the common schools to prepare the young people.

Superintendent de LaBruère said he had paid a good deal of attention to the question of technical education, and made a report nine years previously, recommending industrial technical schools in this Province, because there were none at that time. He had been delegated by the Council of Public Instruction to visit various places, in connection with the Paris Exhibition in 1900, and made this report, which was printed as Return No. 69, 1902, by direction of the Provincial Secretary.

The Superintendent's report gave an account of his visit to technical schools of Paris, such as the Diderot, Estienne and Boule, as well as to various other special industrial, commercial and pedagogic institutions.

AN ADVOCATE OF TECHNICAL EDUCATION.

In the above report Mr. de LaBruère quotes a paragraph from one of his earlier reports (1897) in which he calls the attention of the legislature to the question of the establishment of schools which might benefit the working classes in cities and towns. "The child who is destined for a liberal profession" he wrote, "has the advantage on leaving the elementary school, of going to a classical college; the future merchant can attend our commercial academies or colleges; the farmer's son can complete his farm education in one of our agricultural schools; but the working-man's son has no special school where he can learn the theory and practice of the trade that he wishes to follow, and enters upon his apprenticeship without acquiring the knowledge that he needs to become a skilful foreman or a master mechanic." He argues that it would be a great improvement to found industrial schools for boys in Montreal and in Quebec, or in some other large manufacturing centre.

REPAIRING THE LOSS OF APPRENTICESHIP.

In his report of 1902, Superintendent de LaBruère states that his examination, at the Paris Exhibition, of the work of Manual Training Schools of different countries, confirmed him in the opinion just quoted. He refers to the sweeping away of the old apprenticeship system in France, and adds:—"The appointment of an inspector of drawing classes in the Schools of Art and Design, and others, charged with the duty of supervising the carrying out of the program and the progress of the pupils would be also desirable."

Mr. de LaBruère adds that though the appointment of such an inspector of the teaching of drawing, and the increase in the number of school inspectors, would no doubt further swell the expenses of public instruction, the legislature should not hesitate to do this in the general interest; and he quotes the words of the premier of England, Lord Salisbury, to a deputation of bishops on the subject of educational reform: "We must do what we can, and what we can do must be done quickly."

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The superiority of the results of Manual Training in the schools of France, as displayed in the work shown at the exhibition, was considered as a proof of their efficiency by Mr. de La Bruère, who adds, "The question of introducing Manual Training in the Primary Schools of the Province is before us."

"Canada cannot remain in the background, but should follow the example set by other nations. With our efforts to colonize our territory and to attract foreign capital, the growth of national industry and the education of our working classes should go hand-in-hand.

"By the richness of its arable soil, its forests and its mines, by its many water-powers and great rivers, the Province of Quebec fills a prominent position in the Canadian Confederation. The owner of a vast field for development, it is incumbent upon the Province to give its children intended for the trades the special education which their occupations require.

"If, within twenty years especially, the Government of the Province has deemed necessary to spread among our farming class the teaching which they needed for cultivating the land with method and success, it is urgent to display the same energy in the industrial field in order that the child quitting the primary school may not be left to himself, but that he may, if he so wish, learn a trade under the best possible conditions by receiving from the State, through the foundation of technical schools, the assistance which he can legitimately claim."

IMPROVEMENT IN DRAWING.

Superintendent de LaBruère was forcibly struck with the importance attached to Drawing in all stages of the schools of France, from the infant school for children of 3 to 6 years to the classes of the Superior Primary School. No doubt the improvement in the methods of Drawing, and the special grant of \$5,000 for the teaching of this subject, which receives special attention in the Revised Regulations of the Catholic Committee of the Council of Public Instruction, may be traced to the Superintendent's recommendations following his observation of the work of other countries. On this point he says:—"At the Paris Exhibition, in examining the drawings by pupils of all categories, I noted the excellence of the methods, their practical and utilitarian object, and the particular care given to this teaching.

"The different countries are making powerful efforts to spread the knowledge of this art. Belgium hardly yields to France in this, and the same may be said of England and the United States of America. Russia and Japan also displayed their solicitude for the diffusion of the knowledge of Drawing as an essential feature of their technical training.

"Looking at the strong organization of this teaching in Europe and elsewhere, and the great educative value attributed to it, there is reason to regret that in our Province we do not give it enough attention. If we wish to advance in the path of progress, we must alter our methods, set aside those that are obsolete and adopt the newest ones. Good-natured critics made this remark in expressing their opinions upon our educational exhibition in Paris: 'The drawings still follow the old usages,' wrote one of these, but he added at the same time, 'although

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the Laval Normal School displays in this respect an original and well-combined method.'

TRAINING OF TEACHERS.

Most of the teachers of this Province are receiving professional training only at the Normal Schools, of which we have 11; that is 7 more than we had 10 years ago. The Board of Examiners give about 1000 diplomas every year. I think every teacher should be required to go to Normal School, but now it is quite unattainable. We are trying to attain it.

NIGHT CLASSES, NATURE STUDY, ETC.

Some schools are used for night classes now. Our Department would be very friendly to any use of that kind. The night schools are under the Department of the Provincial Secretary. So far as our Department is concerned, we would gladly concur in such use of the school buildings. It would be a good thing to have young men and women from ages 14 to 17 attend night schools twice a week in the country in the summer and learn in a School Garden. If our prize farms could be used as places for education, so that the boys and girls could see them and also go to evening schools, it would be a good thing.

Our Department is making efforts to extend School Gardens and Nature Study. We give prizes to the pupils. We have a School Garden at the Normal School also, and the pupils receive special lectures.

FURTHER STATEMENT BY THE SUPERINTENDENT.

Hon. Boucher de LaBruère, Superintendent of Public Instruction for the Province of Quebec, in response to the Chairman's request for a further statement regarding the question of Technical Education in the Province of Quebec, sent the following observations under date Feb. 8, 1911:—

"In view of the fact that the Royal Commission has visited the new Technical School at Montreal, and that it is therefore already acquainted with the efforts being put forth by the Government of the Province to provide technical instruction in the larger centres, I take it for granted that your request is especially for such information as will convey an idea of the relationship existing between our school system in general and this important movement in particular.

"The experience of other countries in which technical education has been developed, either by the State or by local corporations, goes to show, I think, that while the end sought is specialized instruction rather than general education or culture, there is nevertheless a vital connection between the education of the ordinary schools and that of the technical schools, and that the progress and advancement of each are of mutual value and importance.

"It is indeed, in keeping with this very principle that at the present moment the Government of the Province has set aside the sum of \$5000 a year to encourage the teaching of Drawing in the schools. This is a subject which has been somewhat neglected in the past, owing perhaps to the fact that while authorized in the Courses of Study, there was an insufficient number of teachers properly qualified

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to give it attention. I have little doubt, however, that its importance has become more evident just now chiefly because a larger number of people have become conscious of the importance of technical education, and that it is realized more vividly than before that the artisan who has to work with plans drawn to scale can do so more intelligently when he has himself learned the elementary principles of drawing.

'So also with the mathematical subjects. A better conception of the importance of arithmetic, algebra and geometry will prevail when their practical value in technical instruction is realized. No one doubts that the immediate aims of technical education are practical; the studies which are indispensable in this connection thus become invested with practical purpose. The influence, therefore, of technical education in the Province must more and more prove beneficial to the elementary and secondary schools, at least in so far as it encourages increased attention to some of the subjects which might otherwise continue to be regarded by many as possessing disciplinary educational value only.

"The proposition that success in technical education in any community must in the long run depend upon the character and the worth of the elementary schools is one which, in my opinion, does not require any special proof. It is surely self-evident. At the same time it is a proposition which may well be urged frequently, in the interest both of technical and elementary education.

"Educationists, therefore, may well be constantly alert to any proofs of general weakness in the teaching of the common branches in the elementary schools. And here again, as I hardly need to inform you, the essential principle to be kept in view to this end is that the teachers in the elementary schools should be everywhere qualified and trained for their work. Ample provision for this purpose has been, and is being, made in this Province, but much missionary work has yet to be accomplished before every local community is convinced of the necessity and importance of special training for the teaching profession, and adopts the rigid and just consequence of offering a suitable remuneration for the trained teacher.

"I will simply add that the Province of Quebec has entered upon the movement with vigor, confidence and good hopes, and that the findings and the advice of the Royal Commission will be awaited with deep interest."

SECTION 3: INFORMATION OBTAINED FROM

Dr. G. W. PARMELEE.

Dr. Parmelee is one of the Secretaries of the Department of Public Instruction, and also Secretary of the Protestant Committee of the Council.

Altogether there are 1400 teachers and between 1000 and 1100 schools under the Protestant Committee. There are about 80 Superior Schools, 25 of which are High Schools, and the rest Intermediate Schools. About 30% of the English teachers are Normally trained. For the last few years enough teachers have been trained for all the schools, 150 or 160 having been turned out in 1910, which should

have been sufficient to fill all the vacancies that would occur in a staff of 1400, but the movement of teachers to the West is very great.

Provision is made for teachers to receive professional training, but a good many in the rural parts lack this, the prominent reason being the insufficient salary in rural schools, which is about \$250. While the cost of board is low, the chances for salary increase by length of service are very small.

OFFICES ROB THE SCHOOLS.

With the vast increase of population in the cities of Montreal and Quebec, many hundreds of persons who used naturally to become teachers, now become typists and stenographers in banking, commercial and transportation companies. Nearly all of those girls are English, because nearly all large companies transact business entirely in English.

The other avenues which have been opened up, and the large salaries offered in the West, have taken our teachers because they have received Normal Training.

The attitude of the Protestant Committee is strongly in favor of professional training for teachers.

PREPARATORY FOR TECHNICAL INSTRUCTION.

The intention is to strengthen the teaching of Drawing throughout the Province of Quebec, by making the teachers better qualified to teach this subject, and the only way to do this for the Protestant schools, witness thought, was through Macdonald College. Professor Armstrong's report on this subject is under consideration. Drawing for the industries and Nature Study for agriculture are fundamental to technical education, and indeed almost so to all kinds of education.

One objection to Manual Training and Domestic Science is their expense, and another is that it is quite useless to put in equipment for carrying on Manual Training, if there is no competent instructor. The teacher is not available, or rather the ordinary teacher is not competent. If an equipment for Domestic Science could be had as cheaply as \$100, Dr. Parmelee thought it would be quite possible to introduce it into all the centres which have Academies.

NATURE STUDY AND SCHOOL GARDENS.

All that can be said of Nature Study and School Gardens as being of advantage to the farmer's son, can be said equally as being of advantage to anybody's son. If these subjects have educational value, they would have such value for anybody going into active life, as well as those going to be farmers. Those who are going towards agricultural industries should be given special preparation for advanced work by the training of the hand and the eye.

Not much is being done in Quebec for the teaching of Domestic Subjects in the schools in the country districts. In rural parts the Roman Catholic convents are doing very much more that way than is being done on the English side. In nearly all the large towns there is a convent, which has its own house-keeping going on, so it is not difficult to run Domestic Science classes under

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those conditions; but with a school that is small, it is not so easy, and therefore the district schools are doing practically nothing. In this section there are only three or four residential schools for either girls or boys except those in connection with the convents.

AFTER SCHOOL, WHAT?

Dr. Parmelee did not know what should be done for young men and women from 14 to 17 for two or three years after they leave school. It is pretty hard to get attendance at continuation night schools. He thought that pupils who do not go on to 15 or 16 years of age in the Superior or Secondary Schools generally went to work. They probably find that the day's work uses up so much of their energy, that they do not take kindly to night schools.

The Province of Quebec has had night schools for 25 years, but attendance is not nearly so large as it ought to be. The instruction in those schools has had no direct relation to the daily occupations of boys and girls; if it had the schools would be more attractive. The smaller the place the harder it is to provide a staff.

Montreal is the only place where night schools are conducted for technical work under the public school authorities, and there are the classes of the Council of Arts and Manufactures, which are held in several towns throughout the Province.

The people are not sufficiently alive to the advantage of technical education, in Dr. Parmelee's opinion, and there is not the strong public feeling in favor of it that there ought to be.

CHAPTER XXIV: TESTIMONY FROM TWO AUTHORITIES ON PROTESTANT SCHOOLS.

SECTION 1: INFORMATION OBTAINED FROM PROFESSOR J. A. DALE.

Mr. J. A. DALE is Professor of History Theory and Practice of Education, at McGill University.

School training in English is one of the most faulty points. Professor Dale last year examined 50 men in Applied Science and their English was below what it should be; that of the medical students examined for the preliminary medical examination of the Province was equally bad. (Professor Porter subscribed to Professor Dale's statement as to the inefficiency of preparation in English, adding that while the best of the students are poor in English those 50 men were at the bottom of their class.)

The best possible teaching of English would be through the use of it in connection with all school work. It saves time and increases efficiency to correlate English with all other subjects. The most obvious failing in education is that it does not allow scope enough for self-expression, either in speech or writing. If the teaching of English were taken away from the curriculum, the vocabulary would be narrowed and the imagination starved.

Teachers-in-training are so badly prepared that work has to be done at the Training School which should have been done in public schools. There is not time to prepare them thoroughly to teach, as well as to supplement their previous lack of general education, and these teachers go out ill-prepared, and send up more ill-prepared students. The solution lies in systematic improvement of the school course, and compulsory attendance throughout the entire course. We will not get better teachers till we have better educated children.

WORK AND PLAY.

In the last 20 years there has been a change in the direction of the activity of children in schools, e.g. Manual Training and School Gardens; this is a practical move in the right direction, which is telling for good in all directions. Organized work in school has educational value apart from earning value; and it is also a means of increased industrial efficiency. In an ideal curriculum this would be one of the sections from the elementary school up. Organized play is an integral part of a good school course; the remarkable success of English Public Schools is due largely to this.

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FLAWS AND REMEDIES.

The enquiry into the technical and industrial education of a country naturally focuses itself on the connecting points between the school system which trains the majority of the children and the after life into which they pass. For the establishment of any work in higher education reveals immediately the true state of previous preparation in the students, and drives the enquiry back to the school system. What is the connection between the school and the after life of its pupils? This question goes straight to the heart of the matter and demands solution of some of the profoundest problems not only of education, but of the national life.

The national school systems have been of rapid growth—they came as a result of the industrial revolution. Modern democracy and modern industry require the support of an educated people. But the systems have developed during a transitional stage of society, and grew to some fixity before there was any clear realisation either of the need to be met by education, or the means of meeting it. The curriculum was either traditional or empirical; often it did not even profess to fit for the actual careers of the children, and was slow to learn the tests of a successful education. The change from this official, doctrinaire view is going on before us at the present moment. All the most vital movements in education concentrate upon this point: how to arrange the school course so that it passes naturally and with the least possible waste into the industrial life. For it is the misfit between school and life which has too often made school a preparation for unskilled labor and unemployment.

In its main features the case is the same in all industrial communities which have developed a system of universal education. In nearly all such places education is compulsory, 14 being the usual age. Yet it is found that children leave school too early either to have mastered the subjects of the school course or to be ready to take up at once such reasonable preparation as is needed for skilled labour. They leave just as they are attaining the capacity to profit by the school-work, and before the industrial organisation (especially since the disappearance of apprenticeship) has for them a worthy and profitable place. The consequent shortage of skilled labor is known to every employer of good labor: the moral harvest of the shiftless years is the despair of every reformer, and one of the heaviest burdens of the modern state. The economic argument for the employment of children has already broken down so far as the employer is concerned: the contention that certain very necessary industries (e.g. cotton) can only be conducted with profit by child labor is very rarely heard to-day. The difficulty of the poor parent is much more serious, and its roots lie deep: the problem is more than educational, but surely not beyond the reach of constructive statesmanship. But the difficulty is less serious in Montreal than in towns where there is more widespread poverty.

As with the flaws, so with the remedies: they are much the same in all countries. I will deal briefly with the following:—

1. Compulsory education, i.e. the fixing of an age below which no child may fail to attend school, nor leave without some evidence of a completed course.

2. The provision of continuation classes or schools for those leaving primary school.
3. The provision of classes for those who, having left school for some time, have discovered the disadvantage of their lack of education.
4. Improved training of teachers.
5. Modification of the curriculum.
6. Employment bureau.

COMPULSORY EDUCATION.

1. Compulsory education means the definite assumption by the whole community of the responsibility for the training of its citizens. When this responsibility is once assumed, the other reforms necessarily follow if the organisation of education is regarded as a business proposition.

It would not be necessary even to touch upon the case for compulsion if it were not that the province of Quebec has not adopted the principle. This is owing mainly no doubt to the fact that it has two entirely distinct systems of schools, the Catholic and Protestant: and there has perhaps been a misunderstanding that a compulsory system might interfere with the denominational character of the former. Without covering the arguments for compulsion I desire to point out the chief way in which the absence of compulsion hampers the education of the children of Montreal.

(a) In the first place, it greatly reduces the efficiency of the present system. There has been much criticism of the Montreal schools. But before assigning the blame, it is necessary to see if that system is working under fair conditions. This is obviously not the case where many children do not go to school at all, where very many go too late, and the great majority leave too early. The schools cannot be blamed for the failure of those whom it has had no fair chance to train. To give them a fair chance, it is absolutely essential that regular attendance shall be enforced from the beginning to the end of the course. Then it will be easier to come to a fair judgment as to whether that course really does succeed in preparing the children for life.

(b) It hampers the improvement of the present system. It is far easier to handle both a single class and a whole system where the attendance is constant throughout the school course, and far easier to introduce desirable changes without dislocation.

(c) It hampers the development of the higher grades of education and of intelligent work, because there is no hard and firm foundation of previous preparation. It is found everywhere, (to take an example) that great numbers of students, anxious to take advantage of evening classes, are too ill-prepared. This is true also in most places which have compulsion, because no place has as yet a complete system which has been working long enough: but the difficulty is felt far less where the system is most complete, as for example in Munich.

(d) It depresses the quality of the supply of teachers. A good standard of previous preparation makes better training possible: for the trainers of teachers now have to spend much time on teaching subjects which ought to be mastered

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in school, and so lose time that is much needed for professional work, especially in this province where the course is, in any case, short. If the schools are to be improved, it can only be through the improvement of the teachers.

(e) It prevents the due care of children in matters outside the narrower conception of education: for there is no complete record of the city's children. With compulsion there comes the school census, the complete list, corrected yearly, of all children of school age. In this way the record of each child is kept, and it is shown that children are being neglected, or exploited, or are defective, or in any way need such help as the community is prepared to secure for them. I will not enlarge on this: the greatest of city problems is the care of its children. The lack of record and publicity which hampers every movement for their welfare is just the condition of affairs in which thrive the agencies of degeneration.

(f) On these special counts, and in general, it is false economy. It neglects the development of the most fundamental and vital national resources, the brains of its future citizens. It depends too much on the abundant supply of fresh trained brains from immigration, and on the possibilities of success offered to untrained natural talent by almost boundless natural resources. In a word it belongs to the *pioneer* stage.

CONTINUATION CLASSES.

2. Evening classes are the first and most natural device for remedying the defects of previous education, and always become necessary where there is a demand for skilled labor in a community where no complete system of compulsory education has been established long enough to have trained a generation; or where there is an adult foreign speaking immigration. But they serve other purposes, notably to give technical instruction to those who are at work all day and (a) will get no other training (b) wish to prepare to enter a technological school, (c) wish to get advanced teaching in a special subject. In all these ways admirable work is being done in very many industrial centres. Some general considerations may be noted:—

i. The founding of technical evening classes usually compels the founding of elementary evening classes where they do not already exist: because the technical classes cannot possibly do much good work if they have to do elementary work as well, and the need of fair preparation is absolute. (The Commission will remember the recent experience of the Shawinigan Power Co.)

ii. It is obvious that evening work puts a great strain on students who have been working all day. This may be exaggerated, and it may be said that all students tend to work long hours and risk injury to health; still it is a distinct drawback, and points to the conclusion that indiscriminate evening classes would form no part of a completely organized system. In their present form they belong in the main to the transitional stage which is developing into universal education.

iii. In addition to the strain of long hours just mentioned, various causes contribute to making irregular attendance the disturbing element of evening classes. The chief of these is that very lack of education which the classes are designed to remedy—it acts partly as a disqualification (e.g. the common case of

students starting on mechanical drawing with no previous arithmetic) and more often as a discouragement. One good authority (Mr. C. H. Creasey) calculates that in England, where there is a highly organized system (which has been in fairly full operation since 1893 and dates its beginning from 1859) the average attendance is below 50% of the enrolment. Other causes are to be found in imperfections of the curriculum, and in method of teaching, which need to be very adaptable and sympathetic: usually too the teacher as well as the pupil is tackling a difficult work at the end of a long day. In advanced classes with specialist teachers a very high percentage of attendance is reached even where the pupils are at work all day (e.g. the tutorial classes of the Workers' Educational Association in England secure practically all possible attendances.) This points to the fact that long hours are not the most serious causes of irregular attendance.

iv. It can hardly be doubted that elementary education as a whole in English-speaking countries, has not been strong in certain points which are very essential as providing the means of further intellectual and industrial development. Concentration, individual study, facility of reading, facility of self-expression—these have been neglected often in the interests of a carefully organised system of instruction. It is certain that clearer aims and more efficient methods will greatly strengthen these foundations of all higher education.

OTHER CONTINUATION CLASSES.

3. The types of classes just considered are either temporary or special in character. The final types of continuation classes will be completely articulated with the elementary school on the one hand, and with the adult occupations on the other. There can be little question that they will be compulsory; being regarded as an integral part of an education that is truly a sufficient preparation for life. This is as it should be, for they cover the years (14 to 17 or 18) which are at once the most difficult industrially and the most fruitful educationally. There is still difficulty in accepting the idea of compulsion, familiar though it is under less formidable names. Yet its wisdom cannot be doubted from any point of view. It curtails a lower liberty which has been proved to fail in the hands of ignorance, for a higher liberty entrusted to trained intelligence and real experience.

This position—that the preparation for occupation must eventually be part of a universal school system—requires some additional justification.

i. Such preparation was till recently provided in the home, the farm, the workshop, where the craft was a tradition and so naturally imbibed. To-day the home and craft are sharply separated, and tradition rendered impossible, by modern industrial conditions: even agriculture is changed from a traditional art to an applied science.

ii. Where the training was organised, the system of apprenticeship served the purpose, for its stage of industrial development: but that stage is passed, and the problem is largely to find its counterpart under present and foreseen conditions.

iii. As the previous means have fallen away, the school has quickly risen as the organised medium of preparation for life. That preparation, conceived originally with hardly any reference to productive occupation, is now being newly

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oriented. The outcome seems certain to be that it will be by means of schools that the fuller preparation of the future will be achieved. This is perhaps the supreme educational problem of our generation.

iv. Historically it may be noted that the earliest attempts to realise this new function of school were (like the first step towards universal education) due to private initiative: and that the state systems have steadily and increasingly adopted it. A few private firms (such as Brunner Mond & Co., of Cheshire, England), realising the double advantage to their employees and themselves, founded schools and made attendance compulsory to the age of 17. There are many intermediate stages, practicable under various conditions and often of the highest value in themselves, till we reach the very complete system now being worked out by Dr. Kerschensteiner in Munich and by Dr. Snedden in Massachusetts. Historically then, as well as rationally, it seems a right and natural extension of school functions.

v. Of the problems that face the construction of such a system only a few general considerations on which there seems a likelihood of agreement can be touched upon here. The age at which the general elementary education will normally end may be taken as 14. On the one hand real specialisation before that age is undesirable; on the other, independent and responsible work subject to the sharp test of practice in the field of ordinary occupations, should not be longer delayed. It may be noticed here, that while longer education gives the best brains a wider choice of occupation, and (if wisely done) a richer and fuller development, the present system allows just these brightest children who would profit by a longer stay, to leave first. (This remains true even where advanced education is free, or where there are scholarships). To keep them in the same school is undesirable; a complementary school is the solution. The closing age is not important: it would depend on the facilities for making the best use of the available time.

vi. Educationally the problem is to combine rational, organised instruction with real workshop practice. This can be attempted along two lines, to turn part of the school into a shop, or to spend some school time in a commercial shop. There is great diversity of opinion as to the combinations of school and shop, and hardly enough experience to decide on any one method. It is not a great matter, and will become clearer when the elementary curriculum is more settled and uniform. e.g. at present much depends on the amount and quality of manual training the pupil has already done. But some conclusions are clear.

(a) School is no complete substitute for shop, nor shop for school.

(b) It is advisable to alternate them in some way. Here again is much difference of opinion, especially whether a period of entirely practical work should not come immediately after school, in order to get fully familiar with the industrial conditions before studying the theoretical. On behalf of this it is said also that it secures business habits; and against it that it spoils habits of study. But the question is really one of administration, to find the arrangement which will least interfere with the true function of both school and shop; this will probably result in the discovery of a new educational institution in which both find due place. The details all probably differ in different groups of occupations.

(c) The school, working full time in the elementary stage, will supply a general preparation for intelligent work, and citizenship. This will be touched upon below in dealing with the curriculum.

(d) By working part time in the technical stage the school will at once secure fair efficiency in the shop and use the shop experience to build up its technical and general instruction.

(e) The shop, working part time, will at once bring the instruction to the absolute test of industrial efficiency and secure that the student's preparation is such that it meets the market.

IMPROVED TRAINING OF TEACHERS.

4. Every extension of education raises afresh the problem of the supply of teachers: this is very true of the type we are considering. Both for the industrial work in the school and the educational work in the shop special preparation is needed. It is a commonplace that we are seeking for a modern equivalent of the lost apprenticeship system. That system with all its advantages was very wasteful in time and energy, and must always be except where there is an exceptionally gifted or well trained instructor. The modern equivalent will therefore require a supply of teachers who combine (a) practical workmanship satisfying commercial standards, with (b) a carefully selected and organised knowledge of the underlying scientific theory, as well as (c) a thorough and economical method of instruction. While the shop specialises in (a) and the school in (b), each will, for the effective dovetailing of their work, need some acquaintance with the material of the other.

MODIFICATION OF THE CURRICULUM.

5. The school curriculum. It is clear that the problem of industrial education involves not only the consideration of adding to the scheme of elementary education, but a re-examination of that scheme itself. The subjects of the curriculum and the methods of teaching them, are undergoing searching scrutiny from a different point of view. The dominant lines of change are in directions which will greatly strengthen the schools, not only educationally but in their function of preparation for industrial efficiency. Of these I can only speak in general terms. Such are (a) The value set upon the training of sense discrimination and motor adjustments. The real meaning of the Manual Training movement and its different phases in different grades, is beginning to be interpreted scientifically: and the industrial is seen to be only one of its values, but it is a real one. A secondary value is that it provides a wider field for individual capacities to reveal themselves, and thus enables education to perform more fully its great selective function.

(b) The value set upon physical fitness. Schemes of exercise (both formal gymnastics and organised games) based upon thorough knowledge of the growing body, are coming to be a part of every well conceived educational system. The same is coming true of medical inspection and other agencies for the physical welfare of school children, culminating in school clinics. Physical education is a valuable aid to (b) in the mastery which it cultivates of various bodily co-ordinations: apart from its value in making the care of health a habit.

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(c) The value set upon intelligence and goodwill as more important results of schooling than information. This is illustrated by the attempts that are being made to restate all the subjects of the curriculum. However differing in different subjects these new methods have certain common characteristics.

i. They attach as closely as possible to actual experience of the things taught, either by analysing some feature of everyday life, or by leading up to their explanation, or by the construction of experiments.

ii. They offer the utmost possible scope for individual practice and self expression.

iii. They lay great stress on the process by which results are attained. They arrange their material in an order which is at once suited to the experience and powers of a growing mind, and is itself logically coherent. The object is thus, not to record results to be memorised, but to set up mental habits.

The moral, social, educational and industrial bearings of the whole movement need no emphasis here. It is clear that the changes in elementary education are such as will make an increasingly fruitful preparation not only for general culture and effectiveness, but also for definite industrial and technical training.

EMPLOYMENT BUREAUX.

6. Employment is not a matter entirely outside the range of a system of education where the object is welfare and efficiency. A system in which the industrial and educational sides are thoroughly articulated in the later school years will have special advantages in finding the right employment for its pupils. Even without this, enough has been done to show the possibility of reducing the number of lamentable misfits between the education which is supposed to prepare for the life, and the life which actually succeeds it. Any complete system of education will comprise its employment bureau.

SECTION 2: INFORMATION OBTAINED FROM Mr. H. J. SILVER.

MR. H. J. SILVER is Superintendent of Schools under the Protestant Board of School Commissioners of Montreal.

There are 7 centres giving Manual Training in wood to all boys in the 6th and 7th years. Some hand and eye training is given in every grade, such as drawing, form study in the way of geometrical blocks, figures, cutting paper and cardboard, clay modelling, plasticine, etc. Weaving is taught in the Kindergarten, but not at present in the higher grades. The boys have 1 to 1½ hour per week in woodwork. In the 5th grade elementary cardboard work is given, including drawing and cutting of models, and regular sketching is done, with the study of form and color and making of articles. Some schools have had woodwork for 15 years, and during the last 10 years it has been compulsory in the 5th, 6th and 7th grades. The effect on the general education and intelligence of the children has been very good, and they appreciate other subjects more in consequence. Children from

6 to 14 years of age should be appealed to through other senses than seeing and hearing. Home conditions do not give as much sense and hand training as formerly, therefore there is more need for it in schools.

Organized games are necessary, and are becoming part of the regular school course. Organized work and play are essential elements of a child's training, particularly in the city. Everything made in the Manual Training course is of use, but is not turned to commercial value. The work done in our schools now is a good preliminary training for a boy or girl wishing to enter industrial life. In the school courses taught chiefly from books, the teacher determines the quality of the work done; the child has no means of estimating the teacher's verdict; whereas in handwork the child's own power of estimating and judging is called into play, and this is essential. It tends to make the child more willing to accept authority rather than less so.

In secondary education optional courses are given in Commercial and Technical High Schools to enable children to discover their aptitudes in commercial, classical, science, technical or housewifery courses. The only way to give children and parents more opportunity of choosing would be to lengthen the course. More Manual Training would have a tendency that way, but this could not be done without reducing the literary instruction. There is a valuable training to be obtained from taking literary and Manual Training work at the same time.

The crowding of school courses results partly from trying to inform the child on too many things; but the amount of information given is not very much, whilst the amount of training is as near the maximum as we can attain considering the amount of information we give. We give about as much as the children can take in; it is not abnormal or excessive. The present course in the public schools gives a pupil a good preparation for a Commercial and Technical High School, but not so good a one for the Classical High School. The Commercial and Technical High School is the natural successor of the old senior school, which existed for 15 years. More in proportion are taking that course than 20 years ago, and there is not sufficient accommodation for those wishing to take the course. The Evening Technical Classes under the Protestant Board have a large enrolment. A boy who has had Manual Training in the Public School would be better able to manage the work at the Technical School. Practically all the pupils at the Technical High School come from the Public Schools.

The Drawing in the Commercial and Technical High School is intentionally preparatory for industrial life, the course being made to fit the needs of those who want to enter industrial callings. In the Peel Street High School the work for girls is more on aesthetic than commercial lines, as many girls there are not going into industrial life. On the boys' side the trend of Drawing is towards the science course, so that 5th and 6th year boys will be able to enter the Science Faculty of the University with some success. A boy taking that course would also make a good designer. Drawing is a universal language, and boys should be familiar with it.

Many boys leave school before completing the course; in the 7th year there is a loss of 35%. There is about 25% loss between those who graduate from the Public School and those who enter High School. The one thing essential

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to keep them in school is a better estimate by themselves of the value of education in regard to their future position and the financial return which it will bring them. Many leave to earn money, and parents and employers encourage them in this. They must be taught that this is a mistake, where it can be avoided; and where poverty makes it necessary, the remedy is in part-time classes and organized evening schools, with the co-operation of employers and shorter days of work.

Progress is being made, but people move slowly. In Montreal at present there are between 14,000 and 15,000 children, and nearly all the Protestant children are in the schools. The Public School is popular and well patronized. A compulsory attendance law would be a good thing, particularly for keeping children longer at school.

CHAPTER XXV: AS TO DRAWING AND OTHER FORMS OF HAND-AND-EYE TRAINING.

SECTION 1: PROFESSOR ARMSTRONG'S REPORT ON DRAWING.

Professor Henry P. Armstrong, of the McGill University Faculty of Applied Science, was in charge of the teaching of Drawing in McGill Normal School and afterwards in Macdonald College. His reports to the Protestant Committee of Public Instruction reveal the situation in respect to Drawing.

His course of instruction and training aims to prepare Normal School students to become teachers of Drawing, and to be able to manage such a course in this subject as may be prescribed.

For practical blackboard Drawing Professor Armstrong requires the teachers-in-training in numbers of from 8 to 12 at a time to stand and work under his direction and criticism at a long blackboard.

In Drawing on paper the students are required to follow, with strict attention to method, a course involving definite familiar straight-line forms, block letters, simple ornament, leaf, fruit and other Nature Study forms; simple representations of common things, handled in front of them, leading to object Drawing from definite points of view; together with a certain amount of ruler practice and the making of measured Drawings.

In dealing with the principles of perspective and the study of form representation, Professor Armstrong uses carefully selected objects which illustrate those principles, and deal with analysis and construction, advising students as to useful aids in producing correct proportions, directions, etc., and in criticising Drawings.

CRITICISM OF SPECIMENS AND METHODS.

After inspection of Drawings, sent in from Superior Schools under the Protestant Committee, Professor Armstrong submitted his criticisms as to the specimens themselves, and the school conditions which produce them.

From the nature of the work submitted, and by personal interviews with the Normal students, the following conclusions were drawn:—

(1) That the Drawing in Superior Schools did not follow any definite plan or schedule.

(2) That teachers—and more often the pupils themselves—had sole choice as to what should be done and sent in for inspection.

(3) That the specimens submitted did not indicate or even suggest what was being done or attempted in such schools.

As to the Drawings themselves, they were stated to consist largely of the mere copying of prints and drawings, which process does not necessarily involve a train-

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ing as to method of using the pencil; does not mean study of form, as the objects are not seen or handled; does not require knowledge of how to direct lines on paper to produce particular effects, or how to estimate relations or parts so as to correctly represent form; does not train the eye to look for those things essential to give the effect of perspective, light and shade and relief; and does not imply any other effort than that of imitation helped by measuring on the flat and transferring to the flat.

SUGGESTIONS FOR IMPROVEMENT.

In a later report Professor Armstrong offers these suggestions for the proper working out of this subject at the Normal School:—

(1) A Course of lectures and demonstrations to candidates for Academy Diploma, touching on the educational value and possibilities of Drawing, conditions, methods, material, etc., should be provided.

(2) That two hours weekly, instead of one, be allotted to Drawing at the Normal School, where the subject was so popular that frequently students asked to be allowed to spend extra time on Saturday mornings; and where all but one of an elementary class presented themselves for examination, though the subject was only optional.

(3) That certificates be issued to teachers who reach a definite standard of ability, in the hope that the same certificate will be recognized by both Protestant and Roman Catholic Schools.

(4) That admission to the Normal School be made to depend partly on satisfactory work in Drawing as well as in other subjects.

(5) That special management of this subject, and occasional inspection at the schools, be given by an expert in it.

(6) That an illustrated syllabus of work be planned for the needs of the different grades and schools.

(7) That an annual Drawing examination be undertaken from headquarters.

(8) That a Departmental School Art to carry on the work, and certificates awarded by it to teachers qualifying for the different stages of advancement, would offer decided inducement to those wishing to specialize in Drawing.

COMMITTEE'S ADVANCE STEPS.

At a meeting of the Protestant Committee in February, 1910, an interim report of the Committee appointed to consider Prof. Armstrong's communications to the Superintendent of Public Instruction, and to report on the whole question of the teaching of Drawing in the Province, was submitted as follows:—

The committee agrees that the present position is very unsatisfactory, and recommends:—

1. That Macdonald College be utilized as a centre for the Art Teaching of the Province.
(a) By its training of its own students as at present. (b) By the provision of work among acting teachers, such as summer school, correspondence, visits to teachers' institutes, or such other methods as prove feasible.

2. That, after a date to be subsequently fixed, the examination certificate of entrance to Macdonald College include Drawing.

3. That Drawing be made compulsory in Model Grade III. and Academy Grades I. and II., the scheme of work being drawn up and supervised (in harmony with the work done at Macdonald College) by the Examination Board at Quebec and the Teachers' Training Committee.

4. That, as a condition of Government grant, each Academy be required to have a member of its staff qualified to teach Drawing in the above mentioned grades.

The committee is considering various methods of teaching Drawing, in relation to the needs of the Province, and the steps to be taken to carry out the above scheme.

SECTION 2: INFORMATION OBTAINED FROM Mr. GEORGE E. EMBERLEY.

HAND AND EYE WORK.

MR. GEORGE E. EMBERLEY is Instructor in Manual Training at Macdonald College.

A boy of 12 who had systematic hand-and-eye training from the kindergarten on would have more of the faculty of mechanical analysis developed, would be able to trace the relation between cause and effect, would be more self-reliant, and would make more progress in his academic studies and in any condition of life, than a boy who had had none of that since the kindergarten. There is more residuum of manual dexterity and ability in a boy who has had the longer training, and when he goes to a highly skilled trade at 15, his hands obey his brain better, and he sees better. A long systematic hand-training in school work would be desirable for all skilled work.

From 8% to 10% of the students in the School for Teachers had Manual Training before coming out, but the interval had been so long that it does not influence their teaching much, and they have not generally obtained any permanent value from it.

HOW THE WORK IS DONE.

Working drawings and freehand design are given in connection with Manual Training. Cardboard and wood are used in the Public School, and iron work is being added. The children make the drawing on cardboard, using no other materials. The drawing becomes real life to them when they try to express it in wood or some material; if the drawing never goes beyond the paper, they have never "proved it out," and hence their drawing is not so satisfactory. They do freehand drawing from objects, principally flowers and leaves. There is not time for making a freehand sketch of a model from which the mechanical drawing is to be made.

Manual Training is correlated with the other departments of the College work as much as possible, e.g. where woodwork can be had to advantage the boys do it. It is useful as well as interesting to make things for use, such as apparatus, mounting maps, binding pamphlets, etc., but there is a certain amount of discipline in doing a Manual Training exercise.

All boys have to take a six months' course in the year, in which they learn about elementary tools, filing them, etc., the character and use of tools and quality and uses of materials, and everything made during that time has a value. This training would be useful to a boy going into brass work, where he had to use other tools, for he would have learnt to analyse things mechanically, and his hands

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would be good servants of his brain. He might know nothing of brass material, but he would have learned mechanical analysis, and had it grounded into him and developed as part of his mental faculties. He would have learnt the relation between cause and effect.

SECTION 3: SUMMARY OF OTHER TESTIMONY.

The general opinion was that Hand-and-Eye Training was desirable, the reasons given being various. Several witnesses considered that it was a good thing for boys to learn to use tools and to recognize the quality and use of materials; they would analyse things mechanically; reason better and be more self-reliant, besides making more progress in other subjects. Boys going into shops after a course in Manual Training can use hammer and chisel, and make faster progress. It helps a boy to learn a trade, and to make his hands obey his brain. If mechanical engineering students had taken Manual Training, it would be a great advantage to them. They should have it at school, and then take 2 years of shop work at the University.

Manual Training appeals to children from 6 to 14, and as they now have less manual work at home, this lack has to be made up. Organized play as well as organized work is an important feature of education. The judgment is exercised, it is concrete and not abstract work, and therefore appeals to the child; it increases his vocabulary, and leads him to realize the deeper relations of life. Other subjects can be taught better in connection with it. It makes the child more willing to accept authority. Older boys are helped to find their bent through Manual Training, and many a boy who is dull at books is clever with his hands. Boys from 12 to 15 want to make things, and the physical exercise of making things is good for their health. It sets a boy thinking.

Manual Training subjects could be correlated with others in the curriculum with advantage. Physics could be correlated with Manual Training and Domestic Science; nature observation can be combined with composition, without interfering with the development of the child's literary instincts.

The same reasons were given for the introduction of Domestic Science. It should be taught in every school, for not less than 2 hours a week. Country teachers should teach Domestic Science, hygiene and other subjects, and these subjects would help rather than hinder the general education of the child. Girls in factories should have Domestic Science teaching, as it is more important for them than for country girls. "The wife is the basis for the prosperity of the family"; therefore all girls should learn to be good housekeepers. Girls learn to distinguish between the important things and the less important, and develop dependableness and thoroughness.

Several witnesses called attention to the problem of providing teachers for these subjects. A course in advanced Domestic Science is given in the Normal School; also nursing, laundry, hygiene, sewing and cutting, etc. Teachers

thoroughly competent to teach these subjects could prepare pupils for technical education in the primary schools. Scientifically trained people are needed. Teachers can take short courses at Macdonald College in Household Science, but this is not enough to enable them to teach it. Household Science should be taught in the elementary schools; also dressmaking and millinery.

Domestic Science and Sewing are taught in the convent schools, but not in all public schools in the Province. The Government grants funds to convent schools for this purpose.

In the Collegiate Institutes cookery is not taught, but bacteriology, physics and chemical products of the oven can be studied.

The opinion was expressed that Drawing for girls should be adapted to their special needs, e.g. in dress-cutting, millinery, etc.

School Gardens were favored, one witness stating that every school should have 2 acres of ground, part planted with different kinds of native trees. Another thought that "farmers would despise them."

Manual Training and Domestic Science have been introduced into many of the schools in Montreal, and will be introduced into all in the course of time. The introduction of these subjects is a hopeful sign, and not only useful for education, but for increasing industrial efficiency. At Macdonald Model School, Manual Training is organized right through from the Kindergarten up.

There is a dressmaking and hat-making School in Montreal attended by 534 pupils, most of whom come at night to learn designing and pattern-drawing. They find good positions.

In most cases the reason given for not introducing these subjects was lack of funds. One or two witnesses thought that young men would acquire intelligence and dexterity with age in the course of their daily work, and therefore did not need Manual Training, though it was admitted that it would do them good. Another reason was the overcrowding of the school curriculum, which left no room for these subjects. Manual Training had been tried in some of the classical colleges, but had not made much headway.

CHAPTER XXVI: AS TO EVENING CLASSES.

To the Council of *Arts and Manufactures*, incorporated in 1872 as an outgrowth of the Mechanics' Institute movement of that time, is chiefly due the credit for the establishment of the present system of evening schools in the Province. The Council's object is to promote improvement in the mechanical arts and manufactures, and among the steps taken to attain that object has been the establishment of about 78 classes in some 13 different places in the Province, which are open to all without distinction of race or creed.

Similar classes have been established in later years by the Montreal Technical Institute, the Protestant Board of School Commissioners, and, as a Commercial necessity, by the Dominion Bridge Company. In each case the results have been highly satisfactory.

In 1910-11 the Province of Quebec had 75 night schools with 169 teachers (6 of whom were females) and 5,828 pupils (563 being girls), average attendance being 3,209.

The steadily increasing attendance of pupils and the excellent results of the tuition given go to show that evening classes are appreciated. Those in charge of industries most intimately concerned are unanimous in the opinion that on the economic side the establishment of the classes was fully warranted by the increased profits accruing from the greater skill and wider knowledge of the workmen who attended them.

The Council of the Montreal Board of Trade, in October 1906, petitioned the Provincial Government to assist to the fullest possible extent in the establishment of technical schools so that the skilled labor so much needed for manufactures might be provided by our own people and not, as is now so frequently the case, imported from other countries. The Board also urged the Government to largely increase the grant to the Council of Arts and Manufactures to assist that body in the good work it was doing.

SUMMARY OF MUCH TESTIMONY.

Evening Schools are advocated to remedy the lack of education of young workers. They are needed for boys of 16 who drift. Boys have their clubs at which they meet in the evenings, and they might just as well be at school; it would do them more good. They would be all the better for it, and the older workmen, too, would be glad to go. Evening Schools should be maintained out of public funds. Pupils must have some definite aim in view to cause them to come. Many workmen are willing to give all their spare time to evening classes so as to advance themselves in technical qualifications.

One witness did not favor Evening Schools, as he thought the boys would be too tired. They have sometimes not been a success for this reason. Girls, especially, are often too tired to attend. Some witnesses approved of the idea, but said it was difficult to get attendance at Evening Schools.

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Most witnesses thought the classes should be free. The Public School equipment could be used. Possibly shorter working days might encourage attendance. The classes should be made attractive with pictures. Evening Classes would be very much better than Correspondence Courses.

Teachers should be prepared for Evening Classes at once. Girls should have dressmaking and hat-making 3 times a week, and Domestic Science Classes, to keep them out of the streets.

Boys should be trained by men, not by women. Evening Schools to reinforce the old apprentice system would be the best; some apprentices now take classes for 5 nights weekly, but most only for 3. Their elementary education is deficient. Workmen and apprentices would attend Evening Schools if they were established.

Evening Schools are very desirable for gaining a knowledge of mechanics and the general use of tools. The teaching of elementary steam engineering and mechanical engineering would be greatly helped if better equipment of apparatus were available. Instruction in Evening Classes was requested by the Shoemakers' Union. Short courses on woods, textiles, leather, would be welcomed; men would attend and it would be a paying scheme. It is doubted whether textile machine workers would profit; foremen would be better for the classes. Bricklayers need Evening Classes. Evening Classes would be useful to teach the quality of leather, pattern cutting and designing.

Evening Schools for the crafts are favored. Evening Classes for metallurgical processes and drawing would be desirable. Evening Schools are required for instruction in science, chemistry and painting, "for the purpose of developing taste and intelligence." Evening Classes for designers are greatly needed, as they have to be imported from abroad. Working people in the Province of Quebec would be enthusiastic over a Technical School.

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CHAPTER XXVII: CLASSES OF THE COUNCIL OF
ARTS AND MANUFACTURES.

SECTION 1: ORGANIZATION AND ADMINISTRATION.

The Council of Arts and Manufactures is composed of 17 members appointed by the Lieutenant-Governor, together with the Commissioner of Agriculture and Colonization, the Provincial Secretary and the Superintendent of Education as ex-officio members. One of the duties imposed on the Council is "to make rules and regulations for the establishment, management, administration, and carrying on of a system of teaching drawing in all its branches in the schools under the control of school commissioners and trustees, in conformity with the provisions of the law respecting public instruction." Hence the classes formed are chiefly intended to afford instruction in drawing, and in its useful applications to industrial purposes, to those having taste and inclination for these matters, but more especially to artisans and apprentices. It is the aim of the Council to make the instruction as practical as possible in order that the pupils may profitably apply the knowledge gained to the various trades and branches of industry in which they are engaged. All the classes are entirely free.

CLASSES IN 1910-11.

Localities.	No. of Pupils.
Montreal.....	1635
Quebec.....	253
St. Hyacinthe.....	196
Sherbrooke.....	100
Three Rivers.....	130
St. Johns'.....	53
Valleyfield.....	65
Sorel.....	29
Charny.....	25
St-Romuald.....	26
Chicoutimi.....	21
Total.....	2533

ORGANIZATION AND BENEFITS OF CLASSES.

Mr. Thomas Gauthier, President of the Council, explained the organization of the classes. The Provincial Government makes a grant of \$16,000 towards the cost of the work. No fees are charged, although students are expected to provide their own material in the Drawing classes. At the end of the session certificates and prizes are awarded to successful students.

That the classes were of the greatest advantage to apprentices was proved by the fact that lads attending had the period of their apprenticeship shortened in the proportion of one day in the schools to two days of ordinary apprenticeship. Many boys had in this way decreased by a full year the term they would otherwise have spent as apprentices. The certificates granted to pupils for this purpose had been officially recognised for six or seven years in the Angus shops of the C.P.R. It was agreed on all hands that the apprentice in addition to shortening his apprenticeship, became a better workman because of his instruction in the classes.

Freehand Drawing, Mr. Gauthier maintained, was absolutely necessary for all trades, and the best possible form of Drawing was direct from the object. It developed the intelligence, enforced the memory, and made the mechanic in all respects a more competent workman.

EVENING CLASSES PREFERRED.

President Gauthier did not think it would be possible for day classes to take the place of these evening classees, as 75% of the pupils were over 25 years of age, and they were all working people who could not find time to attend day classes.

Though the Council had received most urgent requests to establish more schools in the different localities, it was impossible for them to do so, as they had not the means. Mr. Gauthier strongly favored the suggestion that elementary or secondary school buildings should be used for evening classes, and if the object of such classes was to supplement the teaching of a trade he thought the number of pupils would far exceed the accommodation which could be provided. The schools were without question of the greatest advantage to the various industries.

M. J. P. L. Berube, Secretary to the Council of Arts and Manufactures, drew attention to the fact that the female pupils attending the classes were drawn from all ranks of society.

SECTION 2: INDUSTRIAL CLASSES IN MONTREAL.

These were held as follows under the auspices of the Council of Arts and Manufactures (The number of students is given after each subject, the total being 1,259.)

At Monument National, 296 St. Lawrence St. For both sexes:—Music, 121; Modelling, 45; Freehand Drawing, 126; Freehand Drawing (2nd section) 113; Lithography, 23; Architectural Drawing, 123; Mechanical Drawing, 81; Sign Painting and Lettering, 59; Boot and Shoe Pattern Making, 39; Carpentry, Joinery, Stair Building, 81. For women only:—Dress Cutting, and Sewing, 155; Millinery, 78.

At St. Lawrence Market. Plumbing, 127.

At 147 Charron St. Mechanical Drawing, 62.

At Angus Works, C.P.R. Drawing, 26.

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HOW ARCHITECTURE IS TAUGHT.

Mr. Venne, Professor of Architecture, reports as follows in regard to the manner of conducting the courses in Montreal:—

We have pupils from all the trades; clerks, accountants, drawing men in architects' and engineers' offices; of every class and grade and nationality, and the lessons are given in either language. We especially aim to develop their artistic sense, by pointing out what is in bad taste. We make them letter their drawings and plans in the simplest and most artistic way, always in Roman letters. In order to simplify tracing in ink and plans, we make them draw all their lines of a uniform and medium thickness. Further, to encourage their taste, we let them do a few things in color, and in spite of the drawback that the work has to be done by artificial light, the results are most satisfactory.

Particular and individual instruction is given in all cases in the use of drawing instruments, drawing boards, T squares and angles, compasses, pencils, rulers, regular and irregular curves, the scale in English measures. This latter is most important, as the majority of the students come here to learn the use of this instrument, and there are older workers who come after 20 or more years' work for this purpose.

Pupils are questioned individually on the four first rules, with the result that it is generally found that half of them have forgotten what they learnt at school. There are even men of 40 and 50 who never went to school, and have to be taught the elements of arithmetic.

The first drawing lesson is geometrical drawing, to which four to six evenings are given, after which they are quite at home with it.

They draw or copy plans of houses, being told the use of all the materials and the manner of describing them on the plan. At the same time they do calculations on the construction of stairs, resistance of materials, and heating systems (for those in this branch of the trade).

METAL WORKERS, ELECTRICIANS, PAINTERS, ETC.

Sheet metal workers are given special lessons on projections, a most necessary part of their work, and many of them after a year's course make considerable progress in their profession.

Ornamental iron workers also attend the classes for the sake of the drawing which they cannot otherwise obtain.

Steam-fitters are given problems on the installation of heating apparatus.

Electricians learn to draw plans of electric installations.

The more advanced pupils make plans on a larger scale of details of stone, wood, carpentry, iron, etc.

Painters and decorators who are sufficiently advanced have special lessons in ornamental designs in construction on geometrical lines.

The orders of architecture are taught to pupils having special talent for this art, and to architectural students, and these pupils usually begin this work after the second year, when they have mastered the elements of geometrical drawing, construction and ornament. We do not aim to train architects, but at the

same time, our classes have been the starting point for many of our architects and artists.

It is to be hoped that our government will endeavor to maintain these schools practically free, so that the poorer classes may profit by them and develop talent which otherwise might remain unrecognized.

I would venture to add that what is lacking in our elementary, and even higher schools, is instruction in drawing. It is a regrettable thing to meet men in the liberal professions who have no other use for a pencil beyond writing and figuring.

NEED OF FREEHAND DRAWING.

Mr. Jobson Paradis, M.A., Teacher of Freehand Drawing Class for the Council of Arts and Manufacturers, in Montreal, adds to his testimony the following views:

I do not think that Freehand Drawing is given the attention it deserves in our country, and it strikes me as an abnormal state of affairs that government technical schools should exclude this study from their program, as indeed they are doing in our Province.

Drawing being the basis of all intelligent manual work, ignorance of this branch is the weak point in our national production. Decorators, cabinet makers, ironworkers, etc., must employ men from the other side, while we have skilful mechanics here, because our young men have had no training in drawing and are unable to read a working design. This, you will say, is where mechanical drawing comes in as a necessity. Just so, but not altogether, and not until the boy's sense of observation has been developed.

The object of Freehand Drawing, as we are teaching it in our school, is precisely to train the eye; the pupil must learn how to see objects, to estimate at sight dimensions, distances, proportion of surfaces, and delineate forms. For this reason, all work from flat examples has been discarded from our course.

The young working man, jeweller, cabinet maker, wood carver, joiner or stone cutter, is not often called upon to make a working design for a piece to be executed, but he must have a trained eye, a keen sense of observation, and this can only be the result of freehand study from solid objects.

The working design itself can only be done properly after a freehand sketch, and where there is no working design, the intelligent craftsman must form in his mind a definite image, which I would call a "mental drawing", of the work to be executed.

Now, the Council of Arts is the only institution in Montreal where this fundamental training can be had by young men of the working classes; but, for want of funds, these classes are only held a few nights in the week, and during only about five and a half months in the year. A seven-months' vacation is plenty of time for the pupil to forget what he has learned, and to considerably weaken the sense of observation which he may have acquired. Nevertheless, it can be said that with but very few exceptions, all our most proficient artists, painters, sculptors, decorators, illustrators, lithographers, and the like, have received their first training here.

In consideration of the efficient work done by this school in the past years I think it would be a very wise course on the part of the Government to grant

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the Council a further subsidy in order that the classes may be kept running the whole year round.

As for the cause of Art, it will also evidently be helped out by the creation of the new facilities for the study of Freehand Drawing, as it is only by this study in early years that one's taste for the beautiful can be properly developed.

MECHANICAL DRAWING AND GEOMETRY.

Mr. W. A. Booth, who for six years has had charge of the Council's class in Mechanical Drawing at Point St. Charles, Montreal, writes:—

The program of instruction comprised the explanation of drawing from blue prints, and principally the reading of same, to enable them to better understand their various trades. After the pupils are capable of making and reading blue prints their time is taken up by sketching from models of various parts of machines and engines, which is very much appreciated by the adult scholars.

The rank and file of this class in this suburb has been a very representative one, composed mostly of young men hankering after a desire to become more proficient in their daily toil, and with a view for promotion. I recall one or two instances of persons coming as far as from Ontario to attend this class. The practical results obtained I am rather too modest to mention, as it may sound like a boast, but I am delighted at least to state that not a few have made their mark already both in this country and to the south of us, so that I think the Council is to be congratulated on the work it is carrying on, a work that should be recognized by the Province and Country to which we belong.

From time to time I receive letters from some former pupils expressing their gratitude for the knowledge they have acquired through the school and thanking the Council for the positions they now hold.

SECTION 3: CLASSES AT SHERBROOKE.

As a sample of work done outside of Montreal under the auspices of the Council of Arts and Manufactures, the following may be noted from a memorandum by Mr. Robert Wyatt, Superintendent of the Sherbrooke Art School, whose free evening Drawing Classes are entirely sustained financially by the Quebec Government.

METHODS IN DRAWING.

The classes in session in this city are in mechanical and architectural work. The Mechanical Department is divided into three classes:—

(1) The first term pupils are engaged in linear drawings, or in other words projections, the method of instruction to this class being by sketches on the black-board and verbal explanations as well. The students are taught to show the different plans, elevations and cross-sections, tilting the forms at different angles and showing how they appear in those positions.

(2) The second term pupils are engaged on machinery drawings, showing their plans, elevations, cross-sections, etc. They work principally from blue

prints, drawing to a scale, either enlarging or decreasing as the case may be. This is considered eminently practical, and we regard it as actual machine shop practice.

(3) The third term pupils are engaged on the machine itself, taking their measurements by means of calipers, compasses and rules, constructing all the details belonging to the machine which they are engaged on, afterwards assembling the details and making a general working drawing. This is also considered very practical, and a great benefit is derived by pupils working from a machine.

I would suggest that two other classes be established in this city, namely, stair building construction, also a freehand class which would draw from models entirely, omitting all copying whatsoever, as I believe in the latest custom of freehand drawing in Europe.

This school has been under my supervision for the last twenty years, and I have found that it has been a great benefit to the young men who are engaged along the line of mechanical pursuits. It educates them to the language of drawing, and makes it very much easier for them to master their work in the everyday workshop. Sixty persons who attended this school during those twenty years hold very good positions, their salaries ranging from \$1200 to \$3000 per year.

CLASSES FOR THE BUILDING TRADES.

Mr. Louis H. Audet, teacher of the Architectural Class at Sherbrooke, writes:—

The main object of this course is to give to the carpenters, joiners and other people engaged in the building trade a general understanding of plans, and allow them to make details of construction. The drawing they do is the general architects' office working drawing; the most advanced pupils work on a full set of plans for a house—the floor plans, elevations, sections and details of work. A certain number of students are young and have no profession, but simply come to the school to learn drawing. They do usually the same kind of work as the carpenters, etc., though sometimes less practical.

The pupils are not so numerous as to allow of any special division. The lessons given, except the preliminary ones, are individual lessons.

The most advanced pupils, generally the third term students, work on a little sketch given to them. It is simply a problem two or more are working at, or I ask them to make a design for such a thing as any man might ask for, which I have found the most practical way, and while working at this I give them the necessary explanations in the way of showing different things on a plan, the different manner of rendering, etc.

Unfortunately this class does not receive the attention it ought to have, though it is much better than it was a few years ago. Many students come to the class for two or three months, but on account of lack of work in winter they go elsewhere.

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A course in stair building construction is much looked for, and I believe will be of great benefit to the carpenters and joiners of this city. It will be perhaps of a more practical character than the architectural course.

I know some contractors in this city who, being bricklayers and carpenters, by their work at the classes have learned to read plans and after a few years worked as managers of large work and to-day are contractors for themselves. They first came to the school with the idea to learn something that might enable them to become what they are to-day.

CHAPTER XXVIII: CLASSES UNDER THE PROTESTANT BOARD OF SCHOOL COMMISSIONERS.

SECTION 1: EVENING CLASSES.

Evening classes are conducted by the Protestant Board of School Commissioners of Montreal, and supported by a grant from the Provincial Government. Of the total cost of the schools in 1910, the Provincial Government paid the salaries of the teachers, \$3,467.65; the City of Montreal made a grant of \$200 towards the cost of materials and supplies; the balance, \$1,167.14, being met by the School Commissioners.

During the session 1909-10, 20 classes were opened in ordinary school work, with 966 students; 6 classes for male foreigners wishing to learn English, with 334 students; 14 classes in Manual Training, sewing and cookery, with 415 students; making a total enrolment of 1,715 students in all classes, being an increase of 280 on that of the previous year.

There were in actual attendance 720 students on an average each night that the classes were in session under a teaching staff that averaged 34.

Mr. H. J. Silver, Superintendent of the Protestant Schools, said that he could see but two ways of helping the large number of children who found it necessary to go to work at the beginning of the fifth grade in order to help at home. One way was by part-time classes, which had not been tried, and the other by a more careful organization of a system of night schools. In either case the co-operation of the employers would be needed, for if night classes were to be of use, the pupil must have a short day's work, or he would be too tired to benefit by the class. Although the Commissioners had been conducting night schools under the patronage of the government for a number of years, they had not been attended generally by those who needed further education. He believed a scheme for part-time classes feasible, if employers of labor and school officials work hand-in-hand.

MONTREAL TECHNICAL INSTITUTE CLASSES.

Under the joint management of the Montreal Technical Institute and the Protestant Board of School Commissioners, Evening Technical Classes are conducted in the Commercial and Technical High School, 53, Sherbrooke Street West.

The Institute had its origin in the Canadian Manufacturers' Association (Montreal Branch), complaints having come repeatedly to the executive from manufacturers respecting the unsatisfactory condition of technical education in the city. A committee took up the subject with the Mechanics' Institute, and some influential citizens, and a charter was obtained for the Institute.

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The Mechanics' Institute expressed a willingness to contribute liberally towards the erection of suitable buildings. The incorporators, on consulting with the Protestant Board of School Commissioners, found them well disposed towards the movement, and they offered to give the use of their Technical School buildings for evening classes without any charge beyond the cost of heating, lighting and other incidental expenses. The manufacturers and citizens subscribed a Guarantee Fund of \$10,000, and \$5,000 was granted from the Provincial Treasury. The Institute afterwards secured a grant of \$5,000 from the City of Montreal but without any obligation for its continuance.

Increased accommodation has been provided from year to year. The cost to the community has been trifling, notwithstanding the fact that the fees have been extremely moderate, many classes being free. The quality of the tuition in all departments of the Institute work is of high standard, the joint committee having taken special care that the only the best available teachers should be engaged for the work.

The attendance, which has increased at the rate of 30% for each succeeding year, and the faithful work of the pupils have demonstrated fully that there is a consistent and increasing demand for technical instruction on the part of the artisans of the city. The results of the work have fully justified the continued financial assistance from the Provincial Government and the City of \$5,000 each. The Canadian Pacific Railway subscribed \$1,000 towards the maintenance of the classes for the session of 1910-11.

THE TEACHER PROBLEM.

The Principal, Mr. Isaac Gammell, stated that the great difficulty in arranging evening classes was to obtain properly qualified teachers. Out of 27 teachers only about half were professional, and in the technical subjects it was impossible to get enough. The three requisites were (1) experience as a teacher, (2) a college course in the technical subject, and (3) practical experience in the same line of work in order to distinguish what was merely theoretical, what was valuable as a training, and what was practically valuable.

For lack of room, admission had been refused to a very large number who desired to attend the classes in wood working, metal working, cookery and millinery.

A deposit of \$2 was required from each male and \$1 from each female student, but this was returned at the end of the session for 75% of the possible number of attendances.

COURSES, ATTENDANCE, ETC.

These comprise:—a Preparatory Course in ordinary English branches for students not sufficiently advanced to undertake the higher work of the technical classes proper; a course in Practical Mathematics, including Technical Arithmetic, Mensuration, Algebra, Trigonometry, Practical Plane and Solid Geometry; Courses in Freehand, Geometrical, Mechanical and Architectural Drawing; Industrial Designing; Applied Mechanics; Building Construction; Theory of Structures;

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Machine Construction; House Carpentry; Pattern Making; Metal Work and Electrotechnics; and in Cookery, Sewing, Dressmaking and Millinery for women.

The following is an abstract of the attendance for December 1910:—

Subject	Classes	Students	Weekly Sessions.
Preparatory Course.....	4	103	3
Practical Mathematics.....	5	113	2
Mechanical Drawing.....	2	51	2
Freehand Drawing.....	1	21	2
Industrial Designing.....	1	9	2
Architectural Drawing.....	2	32	2
Applied Mechanics.....	1	13	2
Theory of Structures.....	1	5	2
Building Construction.....	1	14	1
House Carpentry.....	1	20	2
Pattern Making.....	1	9	2
Metalwork.....	2	43	2
Chemistry.....	4	42	2
Electricity.....	4	57	2
Cookery.....	8	190	1
Dressmaking.....	5	80	1
Millinery.....	2	41	1
Totals	45	843	31

Percentage of attendance was 77.8.

OCCUPATIONS OF STUDENTS.

The following statement shows the daily occupations of the men attending the various classes:—

Commercial.....	179	Metal Workers.....	129
Draughtsmen.....	61	Electricians.....	54
Woodworkers.....	35	Chemists.....	20
Engineers.....	14	Laborers.....	13
Jewellers, Electro-platers, etc....	11	Bricklayers.....	10
Printers.....	8	Inspectors.....	6
Manufacturers.....	6	Students.....	6
Designers.....	3	Painters.....	3
Teachers.....	3	Dyers.....	2
Gardeners.....	2	Plasterers.....	2
Cement maker.....	1	Photographer.....	1
Tailor.....	1	Engraver.....	1
Blacksmith.....	1	Harness Maker.....	1
Upholsterer.....	1	Veterinary Surgeon.....	1
Time-keeper.....	1		
	327		249
		Total	576

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SECTION 2: THE COMMERCIAL AND TECHNICAL
HIGH SCHOOL.

This school was established by the Protestant Board of School Commissioners with a view of giving pupils who have completed the Public School Course an opportunity to continue such studies as would secure them a good business preparation, or fit them to engage in any of the various occupations in which a previous training in manual work is desirable. The studies offered by the School have, therefore, been divided into two Courses, viz:—a COMMERCIAL COURSE, and a TECHNICAL COURSE.

THE TECHNICAL COURSE.

The Technical Course consists of three divisions—Manual Training for boys, Domestic Science for girls, and Industrial Freehand Drawing.

The Manual Training.—Instruction is of a practical character, given to boys, in Mechanical Drawing, Woodwork, Clay-Modeling, and Metalwork.

Mechanical Drawing.—In connection with Mechanical Drawing, lessons are given in plain and solid geometry throughout the course.

Woodwork.—The purpose is to develop the power of manipulation by using various tools, and to cultivate accuracy by the working of the various exercises embodied in interesting and useful models, made from drawings, worked to scale, in plans, elevations, section, and in some cases conventional isometric projections.

In connection with practical exercises the pupils receive lessons on the nature, growth, description, qualities, seasoning and uses of the more common kinds of Canadian and foreign woods, regarding the names, proper uses, correct handling and principles of construction of various tools involved, and upon the modes of hardening, sharpening and using them.

Pupils are familiarized with wood-turning tools and lathe operations, requisite skill being acquired by means of exercises, or models, such as tool handles, mallets, rolling-pins, dumb-bells, table-legs, and making of tables, thus combining wood-turning with wood-work.

Clay-Modelling.—The aim is to train the eye to observe the shape of objects, then to train the hand to make what the eye has seen. The modelling is done from casts from original designs, suitable for ornaments of inside or outside of buildings.

METAL WORK.

Bench Work.—Composition of soft solders; use of copper soldering, bit composition and use of ordinary fluxes; soldering simple joints in tin and brass work. The connection of plates and bars, and of joints, with rivets, single and double countersunk, hammered cold.

Vise Work.—The form and use of flat and cross-cut chisels; flat, round, square, and half-round files; scrapers, taps, stocks, and dies; screw plates; measuring, and other tools, including calipers, squares, centre punch, scribing and V. blocks, straight-edges, and surface plates. Grinding and keeping in order of the tools used. Making of models, such as squares, calipers, small clamps, etc.

Forge Work.—The form and use of the ordinary forge tools, management of fire, precaution to be observed in heating metals, drawing out bars to square and round ends, forging of simple examples as headed key, spike, nail, forging and tempering centre punch, drill and small chipping chisel. Connection of pieces of bar by welding.

CHAPTER XXIX: THE SHAWINIGAN TECHNICAL INSTITUTE, SHAWINIGAN FALLS, QUE.

This Institute was founded in 1911 in the belief that a town with industries of the size and importance of those of Shawinigan Falls should possess facilities for training its own skilled workmen. The school seeks to meet this need in two principal directions; by evening classes for those already employed, and by a day department for boys over 14 years old, seeking technical instruction. In both fields the instruction is as practical as possible, and as nearly suited to the needs of the individual as it can be made.

The Institute was incorporated by the Provincial Government in 1911. Evening classes in technical subjects and in English began in January of that year and lasted 14 weeks. The work was continued through two terms of 14 weeks each, in 1912-13, with a total membership in the classes of about 60 under 8 instructors.

Mr. J. E. Alfred, President of the Shawinigan Water and Power Co., has guaranteed \$2000 per year for five years, which forms the nucleus of the financial proposition.

THE NEW BUILDING.

This year the Institute moved into its new building, which is amply equipped with recitation rooms, laboratories for Electricity, Mechanics, and Chemistry, and a large well-lighted draughting room. The basement is equipped with benches, lathes, and the usual apparatus for a thorough course in shopwork. The entire top floor is arranged as an assembly hall, suitable for lectures on subjects of popular interest or for functions of a social nature. In the building is also provided a library, free to all members of the Institute.

THE DAY DEPARTMENT.

A day department has been opened for boys aged at least 14 who have completed the amount of French, English, and Arithmetic taught in local elementary schools. Special students are admitted to any course for which they are prepared.

Tuition is fixed at the rate of \$4 per month. 10 free scholarships covering tuition, for the benefit of the first year students, are to be assigned upon the basis of the entrance examination. A well-balanced course embracing French, English, Mathematics, Applied Science and Shopwork has been arranged.

CO-OPERATIVE INSTRUCTION.

As a feature of the work of the third and fourth years, the school is planning to co-operate with the local industries permitting students who desire to work in pairs, spending one week at skilled employment, the alternate week being spent at their studies related to their projected vocation. In this way they will gain an invaluable experience in industry and at the same time be earning sufficient to permit those to remain in school for whom it would otherwise be impossible.

Later it is planned to extend the method to those desiring commercial training, permitting them during their last two years to spend one half of the day at the school, and the remainder as clerks or office assistants.

EVENING CLASSES.

These open in November and run for 20 weeks. The course includes conversational English and French, Arithmetic, Mathematics, Mechanics, Chemistry, Electricity, Mechanical Drawing, House Carpentry. The last mentioned is recommended to apprentice carpenters. The students will construct from blue prints in the amply equipped workshop all the parts of a frame house.

Students must be at least 16, and show that they are able to profit by the instruction. The fee is \$1 per month, or \$1.50 if instruction is given three nights weekly.

THE NEEDS OF SHAWINIGAN FALLS.

Mr. John V. L. Morris, A.B., (Harvard), Principal of the Institute, gives the following information and opinion as to needs of and facilities for technical education in Shawinigan Falls:—"There are at present five principal companies operating in Shawinigan Falls,—the Water and Power Co., The Northern Aluminum Co., The Belgo Canadian Pulp and Paper Co., The Carbide Co., and the new Cotton Company.

NUMBERS OF INDUSTRIAL WORKERS.

"In the Power House the Power Company employs at present 36 men, all of whom should be skilled machinists or electricians or their assistants. The number might be divided about evenly under those three heads. Upon observation I have found that the best of these positions are held usually by men who obtained their training as apprentices in the evening technical schools of England, or else by self-instruction through a correspondence school, where the workman has sufficient elementary education to profit by such instruction. While I have found no discrimination, there is a notable fewness of French-Canadians who have been able to rise to the better positions. This condition seems to be due to their ignorance of English, and meagre education in general.

"The Power Company is also employing at present some 200 odd men on its construction work. Among these are 39 mechanics, 39 carpenters, 9 foremen, the rest being ordinary laborers.

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"The Aluminum Company, working at full capacity, could employ 600 men, but the usual number varies from 200 to 400. Among these at present are some 30 skilled machinists, electricians and blacksmiths. Scarcely any of these, however, have had the benefit of secondary or technical education, and in the plant itself, there is no system for apprentice instruction, so that vacancies have to be filled by men brought in, as a general rule,

"The Belgo Pulp and Paper Company employ men who are to have or should have knowledge of mechanics; in addition to which are others of the 360 men who would greatly benefit by having some knowledge of mechanics, or in general a better education.

"The Carbide Company through its superintendent informs me that they have a total of about 125 men employed, of whom 25 could with advantage take technical courses. (Many of the others would, it seems to me, profit by elementary instruction.)

"The Cotton Mill employs about 200 men and girls. Under present conditions it seems the least promising field for technical instruction of the industries located in this town.

"Besides the employees enumerated above, there is a small wood planing and finishing mill located here, and the Terminal Railway, some of whose workmen have already enrolled in our technical classes. There are also employed in this town, the usual number of mechanics, carpenters, electricians, etc., engaged by the local light company, building construction and the like, as well as clerks, many of whom are eager for instruction in English, the common school branches, and occasionally for technical instruction.

THE SCHOOL OPPORTUNITIES.

"Present school facilities are as follows:—For elementary instruction, there are in this town both French and English schools. These include a convent school for teaching the girls, and a school for the boys with 6 Christian Brothers as teachers, and between 250 and 300 pupils. The English school is co-educational with 2 teachers and about 40 pupils.

"The noteworthy fact in this connection to us is, however, that in this town with a population of 4000, there are absolutely no school facilities of secondary grade for day instruction. The children usually leave school when from 12 to 14 years of age. Thus, while I have no statistics, I should judge that there were probably 300 boys and girls of the ordinary High School ages, who are now out of school. Of course where the parents are well-to-do, they are sent to the numerous boarding schools for some part of this period; still I am of the opinion, that were technical subjects offered as a part of a regular High School program, many who now leave school for the factory, would make a way to attend."

CHAPTER XXX: THE MONTREAL TECHNICAL SCHOOL.

This new institution, at 70 Sherbrooke Street West, which owes its foundation to Sir Lomer Gouin, Prime Minister of the Province of Quebec, was incorporated by law on the 14th March, 1907. The government of the Province of Quebec provided the necessary funds for building and equipment, and grants an annual subsidy towards its maintenance. The school also receives an annual grant from the City of Montreal. This school was opened in September, 1911. For its size, the building and equipment are amongst the finest in either America or Europe. The building occupies a plot of ground measuring 153,000 square feet, and is divided into two distinct sections; the main building and the workshops in the rear.

THE MAIN BUILDING.

The Main Building, which is absolutely fireproof, comprises the administration offices, also several suites for teaching, including 6 class rooms, 2 amphitheatres (seating capacity of 100 each), physical and mechanical laboratory, chemical laboratory, store rooms for materials, museum of industries, library, etc. In the centre is a large graded semicircular amphitheatre with a seating capacity of 600.

In addition the pupils have at their disposal a large waiting room, hygienic toilet rooms and shower-baths.

The class rooms are large, well lighted and commodious, and appliances of the most up to date type are found for the carrying on of experimental work.

The school furniture was built especially for this institution, and is most complete.

The very adequate apparatus used in connection with the teaching will be further added to by the models and patterns to be made by the pupils.

THE WORKSHOPS.

These are laid out exactly like shops in industrial concerns, and are provided with machinery both modern and complete.

In the centre is the production plant for the production of motor power, light and heat, while all around are situated the various buildings, Forge, Foundry, Machine-shop, Wood-working, Pattern-making and Electrical departments.

THE MACHINE SHOP.

This shop has an area of 11,340 square feet. The machinery has been selected from the finest mechanical products of four countries. Electrical ma-

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chines from Nancy, France, stand next to mechanical appliances from Birmingham, England, and near implements made in Montreal, Chicago and Pittsburgh.

The equipment comprises 10 plain lathes of 10"; 12 screw cutting lathes of different makes from 12" to 18"; Pratt & Whitney tool-room lathe; geared head Henley lathe; 3 screw machines, one of which is automatic; 4 shapers; 2 planers; slotting machine; 11 drills from 10" to 20"; Brown & Sharpe universal milling machine; plane and vertical milling machine; profile milling machine; one pentagraph milling machine; universal grinding machine; gear cutter; 5 tool grinders; buffer; 2 centering machines; 2 mandrel presses; 2-ton portable crane.

There are also the following large machines, each driven by its own 15 h.p. electric motor; 6 screw-cutting lathes with attachments; 30" vertical lathe; chucking lathe; 3-ft. radial drill; horizontal boring mill; 8 floor planers.

The space reserved for erecting is provided with a 3-ton travelling crane.

The tool store contains a full line of hand tools, measuring and tracing instruments such as are usually used in the best shops, also 2 Stewart combination gas furnaces. 80 vises and 160 sets of individual tools complete the installation.

FORGE.

(Area, 5,210 square feet). It comprises 24 Sturtevant forges, 24 anvils and one Buffalo Heating Furnace. The draft is underground and produced by a 9 h.p. electric fan. A 4 h.p. electric motor provides the necessary blast. The other machinery comprises a steam hammer of 170 lbs.; belt-driven hammer 75 lbs.; an emery tool grinder; bar shear; post drill; 2 swedge blocks; 2 blacksmith vises, and one tool bench and vise.

FOUNDRY.

(Area, 5,210 square feet.) Provided with King cupola, capacity 2 tons per hour; oil melting furnace; Piat combined cupola and a 200 crucible furnace.

This apparatus is made complete with a trolley of the capacity of 2 tons.

An underground installation for compressed air provides for the working of the elevator and the other pneumatic tools and machines. In the foundry also will be found 2 moulding presses; core machine, coning machine; 2 core ovens; sand sifter; sand mill; sand mixer; 2 snagging wheels; torch heater, and finally moulder's benches for 24 pupils.

WOODWORKING SHOP.

(Area 6,811 square feet). The machinery comprises 8 power wood lathes; 4 electric driven lathes of variable speed; electric band saw; circular saw; jig saw; buzz planer; pony planer; mortising machine; tenoning machine; drill; shaper; 2 grindstones; trimmer; automatic bandsaw filing and setting machine; knife grinder; band saw brazer. This shop includes 31 benches with 2 separate sets of small tools for each.

ELECTRICITY.

(Area 2,714 square feet). This shop, adjoining the machine shop, can make use of all the machinery in the latter.

In addition, the following machines are specially installed for this section:

Armature banding and heading machine; notching press; shear; pair of smoothing rolls; buffer.

To the electrical shop is annexed an electro-dynamics laboratory comprising the following five groups of rotary transformers: 1—One single-phase asynchrone motor coupled with a direct current dynamo. 2—One direct current motor coupled with a three phase generator. 3—One series dynamo with shunt dynamo. 4—One six-change commutator. 5—One direct current motor coupled with an alternator giving single-phase, two-phase, or three-phase current, as desired.

A specially constructed switchboard for experimental purposes provides for the making of any electrical connections or measurements which may be desired.

COST OF MAINTENANCE AND ESTABLISHMENT.

The total cost of establishment was \$850,000, of which \$150,000 was spent on the site, in round figures \$100,000 on equipment, and \$600,000 on the building, including heating system, etc.

The total amount expended yearly for salaries is \$25,400.

The Principal, who is also the Principal of the Quebec Technical School, receives a salary of \$3,750, \$2,000 of which is paid by the Montreal School, and \$1,750 by the Quebec School. He is also provided with a suite of rooms for himself and family.

The professors are paid from \$1,400 to \$1,800; the Superintendent of the shops receives \$1,800, and the foremen who are in charge from \$1,000 to \$1,200.

Until the present year the Government contributed \$20,000 and the City of Montreal \$25,000 toward the cost of maintenance. This, however, proved to be insufficient, and their subsidies will be hereafter \$40,000 each a year. Out of total receipts, including the fees, have to be deducted interest charges and sinking fund, a total of \$38,700.00.

The other main expenses are: coal, \$4,500; raw material and laboratories, \$2,700; insurance, advertising, repairs, general expenses, \$2,700; water, etc., \$850—making a grand total of \$74,850.

The total issue of bonds guaranteed by the Provincial Government will be \$800,000 at 4 per cent., and the subsidies of the Government barely pay for the interest and sinking fund.

ADMINISTRATION AND STAFF.

The administration is in charge of a corporation consisting of 11 members, of whom 4 are appointed by the Lieutenant-Governor in Council, 2 by the Council of the City of Montreal, 1 by the Council of the Montreal Board of Trade, 1 by the Council of the Chambre de Commerce of the district of Montreal, a delegate of the "laboring classes" appointed by the Lieutenant-Governor in Council, a delegate of the Canadian Manufacturers' Association appointed by the Lieutenant-Governor in Council, and the Principal, who is appointed by the Lieutenant-Governor in Council on recommendation of the other members of the Board.

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The school administration staff consists of:—Principal, who reports to the several committees of the Board: Assistant Secretary-Treasurer, who is also Chief Accountant: Assistant Accountant: Clerk (in French “surveillant”) who directs the class movements during the day, and attends to correspondence concerning the pupils, registering and reporting absences of pupils, etc.

The staff for theoretical instruction consists of:—The Principal, 2 Professors of Mathematics and Mechanics, (one French, one English), 2 Professors of Drawing and Technology (one French, one English), 2 Professors of Physics, Chemistry and Electricity (one French, one English).

The staff of workshop instructors consists of:—Superintendent of shops, who, under the control of the Principal, oversees all work of the several shops, 2 instructors in machine shop, 1 instructor each in forge shop, foundry, woodworking shop and electricity shop.

The Superintendent and all workshop instructors teach in French and in English, and are efficient in both languages. All the workshop instructors are practical foremen in their respective trades, and were appointed as the result of a competitive examination. The engineer also gives practical instruction in the boiler and engine rooms.

OBJECTS AND COURSES.

The object of this school is to prepare young men for industrial careers, providing them with adequate instruction, and affording them opportunity to pursue practical and technical studies which will enable them to acquire a proper knowledge of mechanical trades and industry in general.

The school gives day courses, called normal courses, and night courses, called special courses.

The normal courses are given in the two languages, and the special courses in either French or English according to requirements.

DAY COURSES.

These courses are organized principally for the benefit of young men who, having recently finished their primary tuition, are anxious to acquire manual proficiency and all the technical education necessary to become skilled mechanics, capable foremen, or shop superintendents.

These courses are preparatory to the following callings; pattern-maker, wood-worker, machinist-fitter, lathe-hand, electrician, blacksmith, draftsman, and in general to all positions connected with the metal, wood or electrical industries.

The length of the course is ordinarily three years.

No pupil can pass from one year to the next without obtaining the minimum number of marks required by the rules.

Pupils who have passed a satisfactory examination at the end of the course, will receive from the Board diplomas stating the respective course followed in each case.

The instruction is both theoretical and practical. The former is always of a technical nature, comprising principally arithmetic, algebra and trigonometry,

elementary and descriptive geometry; general physics and industrial physics; electricity; general mechanics and applied mechanics; drawing in all its branches; industrial technology, and other subjects approved by the Board of Directors. Lectures may also be given on special subjects which might not require a regular course.

The practical instruction is given in the five following shops: wood-working and pattern-making, foundry, forge, machine-shop, and the department of electricity.

During the first year, pupils are not specialized; they spend 4 successive periods of about 2 months each, in the machine-shop, wood-working department, forge and foundry.

The day courses are given in the two languages, the pupils being divided into two distinct sections, English and French, according to their choice. Both sections are, however, united in the workshops.

The present attendance is: first year 65, second year, 40, third year, 20. The following table shows the provision for each subject in each year.

Subjects Taught.	Weekly Time-Table.		
	1st Year	2nd Year	3rd Year
Workshops.....	15	19½	19½
Industrial Drawing.....	6	6	6
Construction of Machines.....	1½	1½	1½
Mechanics.....	1½	1½	1½
Geometry.....	3	1½	1½
Arithmetic and Algebra.....	1½	1½	1½
Physics.....	1½	1½	..
Chemistry.....	1½	1½	1½
Electricity (general course).....	1½
do. (special course).....	..	(3)	(3)
Technical Conversation in French.....	..	1	1
Total hours.....	31½	35½	35½

EVENING CLASSES.

These classes are organized with the object of giving to workmen or apprentices already employed in the different industries, various kinds of technical knowledge which may help them in their calling.

They are of an absolutely practical¹ nature and will comprise two grades.

The evening classes are given in the two languages, the pupils being divided into two distinct sections, English and French, both in the class-rooms and in the workshops.

Evening classes are wholly practical and were organized for the year 1912 for mechanics, wood-turners, pattern makers, blacksmiths, moulders, electricians, chauffeurs, firemen and stationary engineers, and draftsmen.

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The classes for iron workers and woodworkers include shop work, elementary mechanics, elementary mathematics and industrial drawing. The classes for electricians include lectures on the theory along with laboratory work and practical demonstrations in the testing-room. These courses, however, do not include shop work.

The classes for automobile construction are both theoretical and practical, and deal with the construction, repair and operation of the automobile, but they do not as a rule include outside demonstrations with the machine. For this, however, arrangements can be made if necessary.

The classes for firemen and stationary engineers provide instruction for the running of steam apparatus and on repair work thereon; also the operation of gas and steam engine and electrical apparatus, with a few lessons on industrial electricity.

In addition to the foregoing classes, a course in industrial drawing is provided which all are strongly advised to take.

These classes last six months (October to March), and are open to applicants who have had an elementary education; at present the total attendance is 470.

FEES.

The fees are \$2 per month for the classes including workshop; the school provides, free of charge, tools and materials.

Courses in automobiles, \$2 per month for each course.

The fees are \$1 per month for the other courses, as follows: electricity, firemen and stationary engineers, and for those who wish to specialize in mathematics, industrial drawing, or mechanics.

PROVINCIAL DOMESTIC SCIENCE SCHOOL, MONTREAL.

Courses in Domestic Science have been established in the building of the Montreal Technical School; but the provision, while up to date, is not so extensive as that for the boys.

This school was incorporated by an Act of the Provincial Legislature in 1906 and receives approximately \$1000 a year from the Provincial Government. It receives in addition free rent, heat, and light from the Montreal Technical School.

COURSES OF STUDY.

Courses are provided in both English and French.

The French classes comprise the following:

I. Cooking, dressmaking, mending, fashions, fancy work, household science, common law, gardening, household bookkeeping, hygiene, practical medicine, apologetics, and religious instruction.

The courses are divided as follows:

(1) A normal course for teachers of domestic science, from the beginning of October to the end of April.

(2) A vocational normal course of three weeks during the month of July.

(3) A vacation normal course of three weeks for nuns during the month of August.

(4) Course open to the general public from the beginning of October until the end of April.

II. The English classes comprise the following:

Cooking, sewing, dressmaking, millinery, and laundry work.

SOME GENERAL MATTERS.

Further information obtained from MR. ANTOINE MACHERAS, Principal, Montreal and Quebec Technical Schools.

At present the program of the school is intended for the preparation of journeymen and foremen for the industries, and will not include preparation for the University. The principal object is to help the industries, principally those concerned with wood, mechanics and electricity.

The certificate course will comprise the teaching of mathematics, drawing, design, science, mechanics, physics and chemistry.

Space is reserved for instruction in the building trades, but that course is not specially organized, though it is intended to do so as soon as possible. This part would be more in night classes than in the day time. It is proposed to give attention to the clothing and textile branches and leather industries as soon as they can be provided for, whenever the demand is made. The intention is to provide opportunities for the workers in the main industries of Montreal as soon as the demand comes to the school in sufficient numbers, and to provide both day and evening classes.

We intend to provide opportunities for women in domestic occupations; and this department is now actually in operation.

The qualification for admission for the moment corresponds about to the standard attained in the highest class of a good primary school. This may be modified to suit the trades and industries. We will exact a certain standard for admission. We will have to choose principally for the day course the best men, and we will exact from them more than the ordinary primary school course, the object being to make sure that those who get in will be able to profit by the course, which they cannot do without sufficient education.

The course will be given in both languages.

The general diffusion of Technical Education throughout France has done much for the advancement of the industries and the prosperity of the working people of the nation. The more Technical Education there is, the more benefit there is to the nation and the industries. There are evening courses in every town in France for the benefit of the working men, but there is not a regular technical school in every town. The existence of those courses and classes has not caused much modification in the course in elementary schools to prepare the pupils to reap advantage from the Industrial and Technical Education, for the primary schools in France were very much advanced, and it was not necessary to modify the course. At 12 years, and sometimes 11 years, children can be admitted to the Technical School in France.

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THE QUEBEC TECHNICAL SCHOOL.

The Quebec Government has provided also a Technical School for the City of Quebec which is three-fifths of the size of the one in Montreal, and is constructed on practically the same lines.

The two Corporations are distinct, and each has its Board of Directors.

Funds for construction and equipment were obtained by the issue of 40 year 4 per cent. bonds guaranteed by the Quebec Government, both as to capital and interest.

The Principal of the Montreal school is principal of the Quebec one also, spending part of his time in each, and having his home in Montreal.

The instruction, rules and regulations, etc., are identical in both schools. Fees, day classes, are the same. Fees, evening classes, in Quebec, are \$1.00 per month for all courses, except automobile course which is \$2.00 per month. In Quebec the weekly attendance of pupils in day classes, is six hours more than in Montreal.

CHAPTER XXXI: THE POLYTECHNIC SCHOOL OF LAVAL UNIVERSITY, MONTREAL.

Laval University has 4 Faculties—Theology, Law, Medicine and Arts, and 6 affiliated establishments, viz. the Polytechnic, Schools of Medicine, Dentistry, Pharmacy and Agriculture, and the School for Girls.

The Veterinary School has been affiliated since 1886, and has courses in the humanities as well as in veterinary surgery and science.

The School of Dentistry, in Montreal, at present only takes French-Canadians, but will take English students later. It has a 4 years' course. The School of Pharmacy is for chemists and druggists, apart from the medical course.

The Agricultural School at Oka, under the direction of the Trappist monks, was affiliated in 1908. The University gives degrees and diplomas and conducts examinations every 6 months. It has full laboratory equipment, and teaches scientific agriculture. The courses are preparatory, secondary and superior, of which the two latter lead to diplomas.

The affiliated Polytechnic School takes the place of the Faculty of Applied Science in other Universities, and the Oka School takes the place of the Faculty of Agriculture.

Mr. Ernest Marceau, President, stated that the Federal Government gives \$2,500 for Railway Management and Transportation courses; the G.T.R. and C.P.R. give \$2,500 each, and the Provincial Government has promised the same amount.

The condition of the Government grant is that Railway Engineering and Transportation shall be taught in a special department. There is no control on the part of the Government over the expenditure of this grant, but the course is submitted and a report is made of work done. The Government grant is given by the Intercolonial Railway system through the Department of Railways and Canals.

Graduates easily find employment with Railways, Canals and the Marine Department, and many go to the United States for supplementary training in iron works, especially to Pittsburgh, afterwards returning to Canada for employment. Many are in private practice. There is not demand for more graduates than are at present turned out. Workmen are not trained; students get laboratory practice, but are not turned out as mechanics. Students take practical work in their vacations, and 3rd and 4th year men have a surveying expedition for 3 or 4 weeks. They also visit industrial establishments in Montreal.

Mr. Marceau considered that the Federal Government should subsidize Technical Education, because men go from here to other Provinces, and help to develop them.

The graduates go all over Quebec, Ontario, the United States and many find employment in the Public Works Department at Ottawa.

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The Department of Architecture has been a success. The Professor is a graduate of the *École des Beaux Arts* at Paris, and the students make excellent progress. Attention is given to economy and safety in construction as well as to the decorative side. Very few students have any knowledge of drawing when they come, but in three or four months they are doing well, as the professor is an enthusiastic teacher.

Mr. Alfred Fyen, Director at the Polytechnic, plans the course of studies. The Civil Engineering Course is based on that of other schools, but adapted to local needs. The Board of the Institution may ask questions at examinations. This Board is composed of engineers, not teachers. Most of the teachers are practical engineers; it is a good thing for the school to keep in touch with practical men, and the latter learn from the school. The matriculation examination, which is given in English and French, maintains a high standard of mathematics. Civil engineers need to know both languages in Canada.

Mr. Jules Poivert, Professor of Architecture, stated that he had been in Canada a year and a half. He practised in France previously, but never taught. He had never met students less prepared than here, and stated that the elementary schools in France gave a better preparation. The interest of the students must be aroused by pointing out to them the beautiful things they are to do. The same method could be used in evening classes for working men. Modelling is a good thing, if associated with drawing, but he questioned whether modelling helps pupils to draw. Drawing develops the habit and power of observation in children, and is a desirable, if not essential, part of general education.

PROGRAM OF FOUR-YEAR COURSE.

I. ENGINEERING DIVISION.

A. Science Section (2 years).

Algebra, Astronomy, Architecture, Differential and Integral Calculus, Inorganic and Organic Chemistry, Physics and Electricity, Geometry, (descriptive, pure and applied), Analytic Geometry to 3 and 4 dimensions, Machinery, General Mechanics, Cinematics, Statics, Dynamics, Physics, Topography and Surveying, Drawing, (freehand, geometrical, industrial), Chemical and Physical Laboratories, Surveying Expeditions, Graphic Work.

B. Technical Section (2 years).

Chemistry (analytic and industrial), Applied Cinematics, Construction, Construction and Planning of Railways; Electro-technics (continuous and alternating currents), Electrical Measurements, Geology and Mineralogy, Metallurgy, Mining, Bridges, Industrial Thermodynamics, Thermic Machines, Laboratories (chemical, analytic and industrial, electrical, mineralogy, metallurgy, thermodynamic), Operation of Railways, Operation of Mines, Projects and Drawings, Visits to Industrial Establishments.

II. ARCHITECTURAL DIVISION.

This covers 4 years or more, divided into two classes. *1st Class.* Drawing—geometrical, pen and ink, color-wash, water-color, freehand, shading (theory), Modelling from plaster cast, Chemistry applied to construction, Physics applied to construction, Geometry (descriptive), Stereometry and Perspective, Elementary and Graphic Statics, Elements of Construction, Elements of Architecture, Architectural Composition, Plans and Elevations.

2nd Class (of pupils promoted from 1st Class). Drawing—elevations, competitions, worked out in three styles, Modelling, Construction, Theory of Architecture, Architectural Composition, Building Laws, History of Architecture, Archaeology, Hygiene, Heating, Ventilation, Estimates, Supervision, Contracts, Accounting, Functions of the Architect, Visits to Building Works.

CHAPTER XXXII: MCGILL UNIVERSITY.

SECTION I: INFORMATION OBTAINED FROM

Dr. WM. PETERSON, PRINCIPAL AND VICE-CHANCELLOR.

The aim of this institution is not only to teach the very highest grades of science, but to keep the different branches in touch with each other. The great service of the University can do is to include in its sphere every branch of public usefulness that will enable it to serve the common good. Such work deserves national support—not merely local, for the work is national, binding together the young men and women from all parts. There are now 60 graduates overseas, and 20 students west of Winnipeg. Greater appreciation is needed, especially on the part of the Federal Government, which is thoroughly out of touch with the great centres of learning in the Dominion.

Up in Ottawa they do not know what is being done for the training of those who are to be the next generation in this great country of ours; and by a curious interpretation of the British North America Act they hold that they are debarred from showing any interest. In the minds of certain distinguished lawyers there is nothing in that Act to debar the Dominion Government from interesting itself in Technical Education as much as in Naval and Military Colleges and Physical Training under the Strathcona Trust. In the matter of the Strathcona Trust all that was necessary to be done was what was done by the Federal Government—to get the consent of the Provincial authorities. That same consent could be asked for in connection with Technical Education; and no doubt would be given by all the Provinces.

MCGILL A PIONEER IN TECHNICAL EDUCATION.

Dr. Peterson came to McGill 16 years ago from a Scottish College (Dundee) which had in connection with its curriculum just such a Technical Institution as McGill but with evening as well as day classes. In both England and Scotland the places of higher learning minister to the needs of the artisan. The Manchester Institute of Technology, one of the greatest in the Old Country, has a working partnership with Owen's College. In Dundee the Technical Institute had organic connection with the University College there.

The development of manufactures in places like Montreal, and in Canada generally, would make it necessary, Dr. Peterson thought, for some central authority to take action in regard to the Technical Training of workmen. Had it not been for "this little outbreak at McGill 20 years ago", this part of the country would have had nothing to show in the highest form of Technical Education. Canada has begun at the right end of this matter, for McGill, the pioneer of Technical Education in Canada, was fortunately begun on German rather than on English

lines. England spent vast sums on elementary science scattered broadcast among members of the industries so as to make the individual more fit for his work, but for a long time neglected Technical Institutes, such as those in Germany, for training captains of industry.

GERMAN AND BRITISH METHODS CONTRASTED.

Germany began at the very highest because it had leaders of eminent standing—its schools having been in a thoroughly efficient condition both as regards literary and scientific condition before any other country in Europe waked up to the need of a national system of education at all. England began with the Science and Art Classes, and is only now beginning to fill in with the institutions that the British Government is now subsidizing. Private colleges are becoming Universities, e.g. Manchester, Leeds, etc., and in them England is doing work fit to rank with that of German Universities.

"If I were going to investigate for this country," Dr. Peterson added, "I would not go outside of the City of London under the auspices of the London County Council. While I have been disparaging what England did thirty years ago, compared with Germany, England has picked it all up now, and to-day we have a great deal to learn from England."

THE VALUE OF LEADERS.

For the material advancement of industries one captain is worth six of the rank and file. The work of teaching the mechanic is necessary, of course, and Canada ought to be doing this national work. If such work had not been done largely by one individual more or less as a private enterprise, it certainly would have to be done by somebody. It is a national service that an institution like McGill does, and if rich citizens (such as Sir Wm. Macdonald) who found it gratifying to spend their money in this way had not been doing such work, the Government of Canada would have had to do it, else the country's interests would have been seriously prejudiced.

The 100 men, who go out every year from this faculty at McGill to exploit Canada's industries, connect themselves with works of practical usefulness such as engineering, and have done great service in making known Canada's potentialities. It would have meant a great loss to the material interests of Canada if those men had not gone out.

McGill is not altogether utilitarian in its work; the practical branches are illuminated by the other fully equipped departments of the University.

BASIS OF TECHNICAL EDUCATION.

The phrase "Technical Education" itself is apt to be very misleading. Some people pursue it as though it contained within itself some panacea that would put right everything in education that is out of joint, and heal all possible trouble. But "Technical Education" is nothing but a phrase. It means something altogether different not only for different industries but even for different portions

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of the same industry. Technical Education must rest upon a sound basis of general elementary education. Without that it would be a very gross delusion to speak of it as though it were something that could be superimposed on an Elementary Education which is admittedly defective.

For the Province of Quebec this is a matter of the very greatest importance, for having served fifteen years on the Protestant Committee of the Council of Public Instruction, Dr. Peterson knew that, until more money is forthcoming for schools, you will not have in the Province of Quebec an education really worth the name. Teachers must have adequate remuneration, and must be competent, and until public opinion justifies spending more on education, the search for Technical Education may lead us far afield, for we shall have people asking for Technical Education who are unable to profit by it.

GERMANY GENEROUS TO TECHNICAL EDUCATION.

In Germany the people are willing to spend money on Technical Education; here they still distrust the professor, forgetting that some of the greatest achievements of this country owe their origin to the man in the laboratory who is not personally interested in the application of his discoveries, but who shows the way to those who do apply them to the advantage of the country. He cited the instance of aniline dye which was invented in England and stolen bodily by the Germans, and he believed still remained with them. As an illustration of German enthusiasm for Technical Education he told how the friends of Berlin University, under the inspiration of the Emperor, on its recent 100th anniversary collected \$2,500,000 for scientific research, whilst a new library was presented, also \$50,000 for travelling scholarships. That University is only twenty years older than McGill.

The Universities of this country ought to relate themselves in every possible way to the public service. By Technical Education Dr. Peterson understood the application of science to industry; a scientific basis of lifework; and opportunities to all to become masters in their craft. No institution can supplant workshop training; it can only supplement it. Sir Oliver Lodge defined Technical Education as training in scientific principles which will help the promising youth out of the dull slough of routine to the table-land where he can look about him and assume some intelligent control over his own life. Such Technical Education is wanted not only for leaders but for working men.

HOW TO ESTABLISH TECHNICAL EDUCATION.

On a sound basis of Elementary Education you should have elementary science—not University work, but groundwork—to have students become saturated with elementary science, drawing and the foundation of mathematics. These should be sown broadcast through the community, to saturate the minds of young people with elementary scientific ideas on those fundamental subjects. This is what workmen need. Then add mechanical drawing, woodwork and metal work, and all through the courses, drawing applied to trades and industrial arts. Give the workman the elementary principles of material with which he is working, and

spread the net wide to those who can rise to positions as foremen and skilled workers; add to the directive intelligence of people trained in laboratories the general skill and power of the workmen.

Dr. Peterson feared lack of co-ordination among the various agencies in Montreal, and suggested constant conference so as to fit the different parts into each other. He added that McGill is doing much to standardize instruction in the branches it covers, and in bridging the gulf between the University and the crowd, especially in the Department of Music. He quoted from the speech of the British Minister of War (Haldane) at Armstrong College, Newcastle, on the relation of Science to Industry, which contained the motto of a German trade association—"science is the golden guiding star of practice; without science there can be only a blind groping about in the region of undefined possibilities."

FEDERAL ASSISTANCE NECESSARY.

As it is an expensive business to bring Technical Education to the masses, Dr. Peterson thought that part of the cost of a proper scheme reaching from the lowest to the highest should be borne by the Federal Government. He had looked forward to their intervention. It had been urged that no such uniform system as it is desirable to instal could be established except through the agency of some central authority, and that the British North America Act should not be made a barrier, from either the legal or actual point of view, to Federal action in regard to this matter; and at the opening of the Sherbrooke Street School the highest authority in the Dominion had been betrayed into saying that he did not believe there was any bar in the British North America Act to the Dominion taking up the work of Technical Education from the Atlantic to the Pacific. The State in the modern industrial community had to do much that was formerly done under the apprenticeship system. Fortunately precedents were growing up all the time for such intervention, with the consent of the Province if necessary; but he was satisfied that with the growing prosperity of the Dominion it would be a national misfortune if money derivable from such increased prosperity were not made available from the central Government for Technical Education.

McGILL'S NUMBERS, FINANCES, ETC.

Altogether there are about 1600 students in McGill, as against 800 or 900 twenty years ago. The Science students in 15 years have increased from 250 to 570; in Arts they are more numerous than ever before. The University is now doing work not touched 20 years ago. Cost of staff has increased; specialization of industry has resulted in increased cost for a special staff, consequently the total cost has increased.

The British system of grants-in-aid would be suitable. Grants should be given on the report of an expert. 30 years ago £15,000 was given in England to privately endowed colleges; now they get £300,000.

Grants for research work require consideration, and would need a Commission such as that which now administered the scholarships in England.

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VALUE OF ELEMENTARY SCIENCE.

In elementary schools that come before High School there cannot be too much elementary science—not an attempt to master science—not Industrial Training, for this they learn best in the workshops. Manual Training in the schools is appreciated as an enrichment of the curriculum, and makes the children deft and handy. Technical Education means going back to principles underlying the operation, and these should be learned in the school. Science learned out of a book is of no use to children; physics should not be taught unless there is apparatus, and in Quebec teaching it without apparatus is forbidden. Elementary Science could be equally well taught in denominational or secular schools. Quebec has got beyond the idea that there is any opposition between science and religion. Neither race in the Province wishes to part with that form of instruction which will be helpful as a good foundation for individual moral character.

SECTION 2: INFORMATION OBTAINED FROM Dr. FRANK D. ADAMS

PROFESSOR ADAMS is Dean of the Faculty of Applied Science and Logan Professor of Geology.

The movement which led to the establishment of a Faculty of Applied Science at McGill University originated with Sir William Dawson, who in 1858 established a school of Civil Engineering which, after a severe struggle for five years, succumbed to some unfavorable legislation, having graduated 15 engineers. A long period followed in which no instruction in Applied Science was given in the University; but Sir William Dawson in 1870 writes as follows:—"I never cease to lament the small extent to which we have been able to promote the practical application of Science to Art in this University. In a country so lamentably deficient in schools of Art and Applied Science, and yet aspiring to success in those industrial arts, this would be a most useful department of labor for us." Referring to this and some other of his projects which has failed of accomplishment, but which he is confident will be successfully carried out, when favorable circumstances occur, Sir William writes:—"We wait for some Canadian Lawrence or Sheffield to endow for us a Scientific School like those of Harvard or Yale which have contributed so greatly to the wealth and progress of New England."

In 1871 the teaching of Engineering and Practical Chemistry was revived and reconstituted as the Department of Practical and Applied Science in the Faculty of Arts, and in 1878 this Department was separated from the Faculty of Arts and was erected into the Faculty of Applied Science with a staff of three professors—Dr. Girdwood, Dr. Harrington and Dr. Bovey, and two lecturers, Mr. McLeod (now Vice-Dean), and Mr. Chandler.

A few years later the great benefactor appeared, and through Sir William Macdonald's princely generosity the Macdonald Engineering Building was erected, followed in rapid succession by the Macdonald Physics Building and the Macdonald Chemistry and Mining Building. These buildings were not only erected but were

adequately endowed, and with Dr. Bovey as Dean of the Faculty new professorships were established, provision being also made for the appointment of the necessary teachers of subordinate rank; and the Faculty of Applied Science, thus equipped and endowed, became not only the foremost school of the kind in the Dominion but one unsurpassed anywhere.

McGill University was thus the first University in the Dominion of Canada to establish a Faculty of Applied Science. The School of Practical Science at Toronto was affiliated to that University in 1889, while the Kingston School of Mines was not established until 1894.

GROWTH OF THE FACULTY.

The growth in the number of students in the Faculty about Nov. 10th each year is shown in the following tables:—

<i>Session.</i>	<i>1st year</i>	<i>2nd year</i>	<i>3rd year</i>	<i>4th year</i>	<i>Grad.</i>	<i>Part.</i>	<i>Total</i>	<i>Under- graduates; Total less Partials</i>
1890-91.....	25	22	17	11	—	10	85	75
1895-96.....	64	42	43	29	8	18	204	186
1900-01.....	72	53	39	43	11	38	256	218
1905-06.....	102	100	84	67	1	32	386	354
1910-11.....	191	118	139	111	..	15	574	559

GRADUATE SCHOOL—(GOING FORWARD TO THE FOLLOWING DEGREE.)

	1906-07	1907-08	1908-09	1909-10	1910-11	1911-12
M.A.....	10	19	20	35	36	
M. Sc.....	13	17	33	34	36	
Ph. D.....	7	8	11	16	14	
	30	44	64	85	86	

The increase of students is a reflex of the increased interest in industries. When the Klondike rush came on there was a great increase in Mining Students. When the Transcontinental railways were planned many young men, supposing their services would be required, prepared themselves.

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COURSES OF INSTRUCTION OFFERED.

The instruction given in the Faculty is designed to afford a thorough training, of a practical as well as of a theoretical nature, in the following branches of Applied Science:—

- I. Architecture.
- II. Chemistry.
- III. Chemical Engineering.
- IV. Civil Engineering and Surveying.
- V. Electrical Engineering.
- VI. Mechanical Engineering.
- VII. Metallurgical Engineering.
- VIII. Metallurgy.
- IX. Mining Engineering.
- X. Transportation.

The course of study in every case extends over four years and leads to the degree of Bachelor of Science or Bachelor of Architecture, as the case may be. Special Students, taking a shorter course and not proceeding to a degree, are only admitted under very special circumstances. The work prescribed for the first two years is identical in all courses except I. and II. At the close of the Second Year the student must elect which of the several courses above mentioned he desires to follow.

The courses taken by students of the Third and Fourth Years in 1910-11 were:—

Architecture.....	13
Chemistry.....	7
Chemical Engineering.....	7
Civil Engineering and Surveying.....	72
Electrical Engineering.....	57
Mechanical Engineering.....	40
Metallurgical Engineering.....	7
Metallurgy.....	3
Mining Engineering.....	41
Transportation.....	8

The Department of Transportation is worthy of special mention. Some years ago the presidents of certain of the leading railway systems of the Dominion, having experienced the need of trained men for their service, arranged with McGill to have men specially trained for railroad work. The Department was established under the supervision of the Railway Transportation Committee, consisting of Sir Thomas Shaughnessy, Mr. C. M. Hays, Mr. D. MacNicoll, Mr. C. J. Fleet, Principal Peterson, Dean Adams and Professor Keay. The Department trains men for the following branches of railway work:—

- (1) Construction and Maintenance of Way (in Course IV.)
- (2) Motive Power Department (in Course VI.)
- (3) Operating Department (in Course X.)

About 60 men were in 1911 receiving training which would fit them for entering the railway service of Canada.

Each year a number of graduates have gone into the service of the Canadian Railways, and their work has reflected credit upon the training at McGill.

The University receives from the Railways the sum of \$12,500 annually, of which \$10,000 is employed in the payment of the salaries of the staff giving instruction in those subjects (Railway Engineering, Railway Economics, Railway Operation, Freight Service, Passenger Service, Signals, etc.), which would not otherwise form part of the curriculum of the University, while the balance of the sum is used to strengthen that portion of the regular work of the Faculty which contributes directly to the training of Railway Engineers.

The cost to the University of training students who subsequently enter the various branches of railway service is probably about \$20,000 a year. The difference between this sum and that supplied by the Railways is drawn from the general University funds.

Certain officers of the C.P.R. and G.T.R. are engaged to lecture on passenger service, railway auditing, etc.

Both the C.P.R. and G.T.R. have scholarships here for some of their own men; \$200 a year; failure in examination loses it. The University has arrangements with the railways for taking men who have been trained.

WHERE THE STUDENTS COME FROM.

The students of the Faculty are drawn not only from the Province of Quebec but from all parts of Canada, from Great Britain and many other parts of the Empire, as well as from many foreign countries, as shown by the following table:—

	1st Year	2nd Year	3rd Year	4th Year	Special	Total
Quebec.....	94	60	54	41	10	259
Ontario.....	37	23	37	25	2	124
Nova Scotia.....	2	2	6	4	—	14
New Brunswick.....	4	5	5	8	1	23
Newfoundland.....	—	—	2	—	—	2
Prince Edward Island.....	4	2	4	3	—	13
Manitoba.....	7	3	1	4	—	15
Saskatchewan.....	—	1	1	2	—	4
Alberta.....	6	—	1	2	—	9
British Columbia.....	9	2	8	9	—	28
West Indies.....	5	4	3	5	1	18
United States.....	9	3	5	1	—	18
England.....	8	9	8	3	—	28
Wales.....	—	1	1	—	1	3
Scotland.....	—	—	1	1	—	2
Ireland.....	—	1	—	—	—	1
Australia.....	—	—	—	1	—	1
South Africa.....	1	1	—	2	—	4
Rep. of Columbia.....	1	—	—	—	—	1

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	1st Year	2nd Year	3rd Year	4th Year	Special	Total
Mexico.....	—	1	—	—	—	1
Brazil.....	—	—	1	—	—	1
Peru.....	1	—	1	—	—	2
Ecuador.....	1	—	—	—	—	1
Switzerland.....	1	—	—	—	—	1
Unclassified.....	191	118	139	111	15	574

These numbers, reduced to percentages, show:—

	%
Quebec.....	45.12
Ontario.....	21.60
Nova Scotia.....	2.44
New Brunswick.....	4.01
Prince Edward Island.....	2.26
Manitoba.....	2.61
Saskatchewan.....	.70
Alberta.....	1.57
British Columbia.....	4.90
CANADA.....	85.21
United States.....	3.13
Great Britain.....	5.92
Rest of Empire.....	4.35
Other Countries.....	1.39
	<hr/> 100.00

These figures do not include the 31 students in the First and Second Years of Applied Science in the McGill University College of British Columbia, which is now one of the Colleges of McGill University.

As will be seen from the above table, about 45% of the students come from the Province of Quebec, while about 40% come from other parts of the Dominion; 83 students come from abroad, 34 of whom come from Great Britain.

The Faculty as compared with the various other seats of learning in North America is thus a very cosmopolitan body, having a greater number of students coming from other parts of the Empire and from foreign countries to McGill than there are students coming to Universities of the United States (with the one exception of the University of Pennsylvania) from countries lying without the bounds of the Republic. A further comparison shows that there are only five Universities in North America, (all of them having a very much larger number of students than McGill's Faculty of Applied Science, or, in fact, than the total enrolment of McGill University) which have by actual count a larger number of students from abroad than the McGill Faculty of Applied Science.

LENGTH OF SESSION AND CHARACTER OF INSTRUCTION.

The length of the college session varies somewhat in different courses and different years; it averages about $8\frac{1}{2}$ months. During this time the students are

receiving instruction at Montreal, consisting of lectures and tutorial work in the class-rooms; demonstrations and practical work in the laboratories and drafting rooms; courses of instruction in the machine shop, carpenter shop, smith shop and foundry; field work in surveying, etc. The distribution of the students' time between the class-room, laboratory, workshop and field varies according to the requirements of the professional work of each course.

The School for Surveying Fieldwork, held each year during September, is under the direction of Professor McLeod, is very thoroughly organised, very completely equipped, and does excellent work. The students taking this work go under canvas during the entire month, the University having one large camp at Bord de Plouffe and another at the top of the Little Mountain. In these camps the students live and devote their time entirely to the practical study of the various branches of surveying.

The Field School in Mining, which is an obligatory part of the course in Mining Engineering, is required in the case of all men entering the Fourth Year. The work of this field class, dealt with more fully in Prof. Porter's statement, has been found of the greatest value, as it at once introduces students to the practical side of their professions, broadens their views on the resources and industries of the country, and prepares them for the advanced studies of the Fourth Year.

There is also a Summer School in Geology for Mining students.

WORK DURING VACATION.

The Faculty of Applied Science owes no small measure of its success to the manner in which instruction in principles and practice of Applied Science have always gone hand in hand. After spending $8\frac{1}{2}$ months at the University in formal instruction as detailed above, the students, although not absolutely compelled, are strongly advised to take up work on Surveys, or in Mines, Machine Shops, etc., thus entering the actual practice of the profession for which they are in training. In the summer work they take their places on the field parties, in the mines, or in factories, doing the same work as regular employees of companies, returning to McGill at the opening of next session to resume their University work. The student spending three consecutive vacations in actual practice in this way, obtains an admirable introductory training for his professional work. Thus 306 out of 354, or $86\frac{1}{2}$ per cent, of the students of the Faculty worked during the summer of 1910 for an average of 3.2 months, the details being as follows:—

1 month or less.....	23
2 months.....	56
$2\frac{1}{2}$ months.....	22
3 months.....	66
$3\frac{1}{2}$ months.....	21
4 months.....	77
5 months.....	41
	—
Total.....	306

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The character of the work secured and the number of men who followed each kind of employment are here shown:—

<i>Employment.</i>	<i>Number of men.</i>
Mining and Ore Dressing.....	30
Surveying.....	67
Prospecting.....	1
Drafting and Designing.....	17
Machine Shops.....	50
Construction and General Contracting.....	52
Electrical Work.....	31
Metallurgical Work.....	4
Chemical Work.....	6
Architectural Work.....	6
Bookkeeping, Clerical Work, Railway Operating, etc.....	35
Farming, Fire Ranging, etc.....	7
Total.....	306

Of these men about 80 were engaged in work for one or other of the Canadian railway systems; some of them in railway surveying, others in drafting or construction work, and others in machine shops.

A course of this kind, combining instruction in the principles and practice of their work, affords an ideal training for students in Applied Science.

READING AND LANGUAGES.

During the vacations at the close of each of the first three years the students are also required to read and pass an examination upon certain books. Those required from the students entering the Second Year are certain well-known English classics. Books dealing with certain great economic problems which present themselves in modern industrial development, are assigned to students entering the Third Year; or, in place of such reading, these latter may submit an essay on some engineering or allied subject, preferably one with which they have been occupied during the vacation. Such an essay is required from each student entering the Fourth Year. We do not require a higher standard in literature and language than the School of Practical Science in Toronto; in French we do. Our English should be much higher, but we cannot get it from the schools. Common schools should teach English better, especially clean and precise composition, and the University would benefit thereby.

BUILDINGS AND EQUIPMENT.

The Faculty is housed and its work is carried on in the Macdonald Engineering Building, the Macdonald Chemistry and Mining Building, the Workman Building and the Macdonald Physics Building. The students also receive a portion of their instruction in the Redpath Museum and the Redpath Library.

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NUMBER OF GRADUATES IN THE FACULTY OF APPLIED SCIENCE.

Total number of graduates now alive, including the Class which graduated in the year 1909.....	879
Number of deceased graduates.....	47
	<hr/> 926

Including the 15 who graduated in the old course of Civil Engineering, which antedated the inauguration of the school in its present form, the following list gives (so far as present addresses are known), the distribution of Applied Science graduates:—

Australia.....	2
Belgium.....	1
British Guiana.....	2
Canada:—	
Alberta.....	29
British Columbia.....	50
Manitoba.....	25
New Brunswick.....	13
Nova Scotia.....	30
Prince Edward Island.....	3
Ontario.....	200
Quebec.....	274
Saskatchewan.....	2
	<hr/> 626
Chili.....	1
China.....	1
Cuba.....	1
England.....	12
Hawaiian Islands.....	2
India.....	1
Jamaica.....	6
Japan.....	1
Mexico.....	7
Newfoundland.....	5
Peru.....	3
Porto Rico.....	1
Russia.....	2
Scotland.....	2
Siberia.....	1
South Africa.....	5
Spain.....	1
Switzerland.....	1
United States of America.....	133
Wales.....	1
	<hr/> 818

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These numbers, reduced to percentages, show:—	%
Alberta.....	3.55
Saskatchewan.....	.24
British Columbia.....	6.11
Manitoba.....	3.05
New Brunswick.....	1.59
Nova Scotia.....	3.67
Ontario.....	24.45
Prince Edward Island.....	.36
Quebec.....	33.49
<hr/>	
CANADA.....	76.51
United States of America.....	16.27
Great Britain.....	1.83
Rest of Empire.....	2.57
Other Countries.....	2.82
<hr/>	
	100.00

A very important movement relating to the work of the Faculty was inaugurated in 1909 by the graduates in Applied Science. This was the organization of the graduates of the Faculty, and the establishment by them of an office in Montreal. Nevil Morton Evans, Esq., M.A. Sc., Associate Professor of Chemistry, was requested to act as Honorary Secretary for the graduates, and in his office (Chemistry and Mining Building, McGill University) a list of the graduates is kept, with their correct addresses, their occupations, etc. From time to time the Secretary also issues to all graduates Bulletins of information concerning the Faculty and its graduates. To the Honorary Secretary also all communications from graduates desiring positions, or from older graduates who desire to secure the services of younger men, are directed. This movement has already proved to be of great value, and will, it is believed, be of ever increasing service and importance as the work of the Faculty develops.

COST OF A COURSE OF INSTRUCTION IN THE FACULTY OF APPLIED SCIENCE.

The fee for the regular course of study is \$200 per annum, except in the case of students in the Department of Architecture, who pay an annual fee of \$150. The total cost of following a regular course of study in the Faculty (including fees) may be stated to be \$450 for each session of 7 months. A student can live more comfortably if he can spend \$550. In certain years of several of the courses an extra month of residence is required, for which a proportionate expenditure must be added.

The great majority of the students, by working during the summer, can not only provide for their summer expenses but can earn enough money to substantially assist in defraying the cost of their education during the succeeding winter while at college. Some few men pay the entire expenses of their college course by money thus earned.

There are a number of prizes and two or three Exhibitions and Scholarships open to students of the Faculty; and a fund has recently been established by the graduates of the Class of 1899 from which loans are made to students who, having completed their Second Year, require financial assistance to enable them to complete their course of study.

Possibly the large fee here tends to keep out shirkers, because if a man fails in three subjects he is sent home. Even with large fees, the Faculty falls behind, for the fees cover only 33% of the cost. The fee was raised from \$150 to \$200 because of the deficit.

SECTION 3: INFORMATION OBTAINED FROM PROFESSOR CLEMENT H. McLEOD.

PROFESSOR McLEOD is Vice-Dean of the Faculty of Applied Science and has had long experience in training Engineers.

The University gives no credit for Manual Training, though this and Drawing would help students in their work at McGill. If the University were to recognise the value of Manual Training for matriculation, the schools would provide it, and if obtainable in schools the University might exclude it from its course and replace it with something else.

Very few students have had good Elementary Drawing at school. If an option were given for Drawing and Manual Training instead of language, it would be diminishing the requirement of general educational attainment in training engineers. Manual Training and Drawing could not take the place of French, for though they are important to develop general intelligence, they do not give the power of expression and of reading works not attainable in English. If the University gave recognition to Drawing and Manual Training, the schools would need a year longer, and students would come to the University a year later. The University is beginning to feel that another year is needed in engineering courses; and this might be the solution. More efficiency will be required in engineering as time goes on, and the University should encourage those things in the school curriculum that would help students to attain that efficiency.

Perhaps school education should recognize a branching off to University and industrial sections before the matriculation standard is reached. If the University recognized Drawing and Manual Training as necessary for matriculation, both would be desirable and the University would get the benefit of them in both places. If students came up a year later with these additional attainments, they would reach a higher standing in the college courses.

Vacation work has proved most valuable; the student is able to utilize his holidays in practical service, applying the theory he has learned. Some think it a good thing to take a year out of college, between the 2nd and 3rd or 3rd and 4th years, in order to mature the student through practical work, teaching him to appreciate better his college work, to realize its value for his own life and to recognize what he needs most in college.

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SECTION 4: INFORMATION OBTAINED FROM Dr. J. B. PORTER,
PROFESSOR OF MINING ENGINEERING.

McGill University students are required when entering to show a good knowledge of mathematics, of one modern and if possible one ancient language, and of the usual English and general subjects of the higher schools. They then devote their time for two years to advanced mathematics, physics, chemistry, elementary mechanics and surveying. They also give a great deal of time to drawing and to shop work. In addition to their studies in the University they are required to do one month of each year of extra-mural work in surveying.

Up to the end of the Second Year, all engineering students take up the same course; after that differentiation begins, mining and civil engineers giving more time to surveying and surveying field work, while electrical and mechanical engineers spend additional time in the drafting rooms and machine shops.

In the Third Year in the Mining and Metallurgical courses, lectures are given on the elements of mining, metallurgy and ore dressing, and final work is done in the more general engineering subjects.

At the end of this year the class is taken to the field and five weeks are spent in studying mines and metallurgical plants under the personal direction of the staff of the department. The district visited is carefully chosen with a view to offering the students the best possible opportunities for observation. This is necessarily at a distance from Montreal, generally either in British Columbia or in Nova Scotia. Special cars are provided, and the class, usually numbering 20 to 25, spends a month or six weeks in studying the mines and smelters in various parts of one or other of these provinces. The method in general is to first spend ten days or a fortnight in one particular mine or works, thus familiarizing the students with the plant and making them quite at home in it. The remainder of the period is spent in visiting other works, one or two days being given to each, and the differences in method, etc. noted and studied.

During these excursions, which are ordinarily carried out in a private car chartered for the purpose, students and staff live together, and informal lectures and discussions are held whenever practicable, in order to call the attention of the men to salient points of interest.

While this class work is going on arrangements are made with the managers of the plants visited to take on individual students for the remainder of the summer as workmen. In this way it has always proved possible to provide employment for all men who have not already secured engagements for the summer, and at the end of the field school the class disbands, not to play for three months, but to go to remunerative individual work.

On the return to the University in the autumn the detailed technical and laboratory work already referred to is seriously begun. Certain typical operations are performed by the whole class, such as a stamp mill run, the concentration of a lead or copper ore, and a short campaign with a copper or lead blast furnace. The main work of the succeeding six months is, however, individual, and each

man is encouraged to take up some investigation which is especially interesting to him, such as the concentration of the ore from some mine in which he hopes to obtain employment, or the smelting of a particular material, etc. This individual study is under the eye of competent instructors, and assistance is given when needed; at the same time, and, when possible, in the same connection, the student is required to design work and to prepare approximate specifications and estimates.

The University course thus closes with a year of work as practical as possible, yet so laid out and directed as to be theoretical as well, and at its end the student is sent out to begin the practice of his profession. His education is, however, but half over, and if he wishes to achieve high success in the end, he must content himself with a subordinate post for many years, and work hard patiently to master the details of his special business, to learn to command men and to know himself.

All students take shop work to a certain extent; the first two years is common to all courses; the mining men also get Chemistry. The equivalent for advanced shop work is work in a concentrator or steel work. While this is almost essential, a certain amount of work under instructors is very valuable. Dr. Porter would be sorry to see laboratory and field work replaced even by a longer experience in the practical shop work. This has been shown in English works, where men taught exclusively in the shop did not have the same intelligent and inspired guidance as those in the same shop under a college instructor.

Under Canadian conditions it is better for men to get experience in summer vacations than by taking shop work for a year or two and then taking a college course.

Considerably over 90% of the students take summer vacation work; the University requires 6 weeks field school in the mines, where every man has to work under the supervision of a professor and assistants. In addition to that, 95% spent 6 or 7 months with mining companies.

Students are ill-prepared in English, and do not realize how unprepared they are; their teachers have been incompetent, and the Faculty cannot get the students interested in English. It is too late when they enter, and they find it hard.

SECTION 5: INFORMATION OBTAINED FROM Mr. R. J. DURLEY, PROFESSOR OF MECHANICAL ENGINEERING.

In the woodworking room they had a pattern maker, assisted by a cabinet maker a few hours each week. The supervisor in the blacksmith shop, who was formerly in charge of one of Angus shops of the C.P.R., gives his whole time here now. The Department has the whole time of 5 skilled mechanics, 2 of whom are machinists.

The arrangement of the shop course involves a course of Manual Training in the first year, e.g. elementary woodwork which would not be given here if students had had it at school.

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Boys are given a piece of work which they should be able to do at the end of the First Year; and if they do it satisfactorily, they are exempted from the Manual Training course; this should encourage schools to give Manual Training. Only five or 10 students in a year come up with proper training of that kind. Knowledge of tools acquired at school would save time here.

It would not be economical for McGill to teach High School mathematics; students now have to get it elsewhere, as it is called for in the matriculation examination. If McGill gave similar recognition to Manual Training, perhaps boys would get it in some schools; but the difficulty would be that such a requirement could not become operative for 3 or 4 years because school courses would have to be changed, and school authorities would object to the additional expenditure; at the same time the requirement would have a very strong tendency towards giving the University what it needs. A man cannot become a Mechanical Engineer without a knowledge of tools; he now has to learn that here. It could have been done better before boys come here.

SHOP WORK GIVEN TO STUDENTS.

Students get shop practice, but not under commercial conditions; our shop work is intended to give them what they cannot get outside—to enable them to understand principles. After the Manual Training course, students carry out graduated exercises to give them an elementary training in handicraft, so that when they go into shops in summer they can save time and drudgery. In the 3rd and 4th year students get the experimental side of shop practice, viz.: learning, by actually doing the work, the effect of changes in tool hardness, cutting speeds, etc. This is really laboratory work, and very valuable, but just what they do not get in a machine shop. Then they do time-work, making notes of time taken and how to shorten it, and thus make an economic study of shop work. They also get talks on particular features of the work in hand. They are assigned a definite course of reading, and have to pass on all three—shop and written work and assigned reading. Such a course has much educational value.

NEED OF SHOP EXPERIENCE.

The Cincinnati system would not do as much as our system unless work were carried on in shop under close supervision of competent instructors; because experience under commercial conditions will not be so valuable unless the boy has to mix with men and carry on work under the routine and discipline of the shop. One reason for insisting on shop experience is that they learn the point of view of men with whom they have to work, and for whom they will have to plan work. The results of taking students to visit outside shops is not always as beneficial as might be, owing to the difficulty of handling a large number in a strange place. The proper way is to map out the visit beforehand and appoint guides for special parts; otherwise the boys do not take in anything; they are unable to do so without a good deal of shop experience. We are trying to do the equivalent of the Cincinnati work in a slightly different way. In the Angus shops of the C.P.R., men spend a year or more in manual work. All our graduates would not be capable of guiding workmen as to their improvement, but some would.

EVENING CLASS WORK.

Most of the evening class students are apprentices, taking 2 to 5 nights a week. The average lad does not get much good from evening class after a day of 10 hours' work. Evening work for apprentices should be abolished; employers should organize their own schools and let apprentices attend in the Company's time. The benefit to Companies in the provision of intelligent men suitable for promotion would be sufficient in the long run to prove the success of the plan. Journey-men should have similar facilities; perhaps they could not have it in the day time, as the loss would be greater to employers. The German Continuation Class system would be best. Our Engineers have no difficulty in obtaining employment.

NEEDS OF TECHNICAL EDUCATION IN CANADA.

Technical instruction for engineering or manufacturing industries should provide for the education of (a) boys learning handicrafts or trades, who are intended to become skilled mechanics, or possibly foremen or shop superintendents; (b) boys fitted by education or natural ability to aspire to higher appointments, who hope to be engineers, managers, and persons in charge of large industrial operations.

The large Schools of Applied Science in connection with the Universities in Canada appear to make reasonably adequate provision at present for the needs outlined under (b), and it seems probable that the demand will continue to be fairly well met as the Universities develop with the country. Experience shows the need of a better standard of general education (especially in English) on the part of men entering technical courses in the Universities; also the need of scholarships to assist needy but deserving students, and those who may be able to rise from class (a). Large employers of labor, who benefit by the provision of a supply of young men fitted for ultimate promotion, should be expected to contribute more largely than at present to the upkeep of the large schools of Applied Science referred to.

SUGGESTIONS FOR TRAINING FOREMEN, ETC.

As regards the needs of class (a) comparatively little appears to have been done in Canada up to the present time. In connection with educational work of this kind, intended primarily to benefit those who will have to earn their living by their own manual skill, the following points suggest themselves:—

(1) The necessary skill in handicraft and in the operation of machine tools which an apprentice must have in order to become a skilled mechanic, can be obtained only by lengthy shop training; and in most trades only a very small portion (if any) of this training can be advantageously given in school workshops. For the machinist's trade, for example, the school workshops have completed their usefulness to the trade apprentice when they have given him instruction in the methods of handling comparatively simple pieces of work with hand and machine tools. His further shop experience, teaching him how to deal with more varied and difficult work, must be obtained in a place where work is

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done under commercial conditions, because no school workshop can afford to carry on its operations on the necessary scale. In certain cases, on the other hand, school workshops are advantageous because they enable a student whose regular work in the commercial shop is monotonous or repetitive in character to see operations which he is not likely otherwise to come across. Thus the machine shop of a school could with advantage give instruction to certain machinist apprentices in tool-making. The construction of gauges, jigs, or machine tool fixtures, which they might use in a commercial machine shop, would rarely form part of their regular work there. School workshops can teach elementary handicraft admirably and with great economy of time, but they necessarily fail to reproduce the conditions of a commercial shop where the time-cost of production is one of the most important considerations.

EMPLOYERS AND UNIONS SHOULD CO-OPERATE.

(2) A demand from employers for skilled mechanics having arisen within the last few years, it seems fair that any scheme of technical instruction should be supported by employers and by managers of large industrial concerns who would be chiefly benefited, and any course of training adopted should be such as to commend itself to industrial leaders of that branch; but employers should themselves be prepared to make some sacrifice, by giving the apprentice or learner at least a portion of the time he needs for self-improvement.

(3) Co-operation and approval of Trades Unions, and the support of workmen as a class, are necessary for the success of any scheme of technical instruction, since students must come from this class of the community, and because the workmen in any shop must assist to a large extent in training the apprentices, not only by imparting information directly, but also by a friendly and sympathetic attitude towards the boys and their work.

(4) Training must include not only shop instruction, but also school instruction in elementary branches of science connected with various trades, in Drawing, and in certain other subjects. The bulk, if not all, of this school instruction should be given during the day-time in hours during which the employer should release the apprentice from work, and the latter should be under works discipline, and should be paid by the employer. Attendance, in my opinion, should be compulsory. Experience has shown that school instruction given in the evening to a youth who has already worked from 8 to 10 hours is very ineffective; in fact only the strongest and most vigorous, physically and mentally, can benefit from such work.

COMBINED SCHOOL AND WORKSHOP.

(5) The course of combined school and workshop instruction should give opportunities for the student to take a certain limited amount of elementary scientific and general cultural work not necessarily connected with his trade. A promising student would thus be able either to fit himself for a higher technical course, of University grade, or to follow some line of intellectual work or course of reading which would be his "hobby" and recreation.

(6) The school organization, whether connected with the works or other-

wise, should be such as to cultivate the student's interest and pride in his occupation. The highest ideals of workmanship and conduct should be presented; this can only be done if the teaching staff is very carefully chosen, and if close and friendly personal relations exist between teacher and taught.

(7) With very few exceptions the teachers in such technical or industrial school systems should themselves be working at the industries in connection with which they teach. While this is not absolutely necessary in subjects such as chemistry or physics, the arrangement is very advantageous when it can be carried out, because a teacher of the same trade looks at his work from a point of view which at once appeals to the apprentice. For example, a technical drawing class in connection with a large electrical manufactory should be taught by a man completely familiar with the construction of the factory products, so that he may select and use as examples objects dealt with by the students in their daily work.

(8) The course should be so arranged as to produce not only good and well instructed workmen, but also good citizens. It may be here noted that many of the German continuation schools provide instruction for apprentices in the history of their trade, in hygiene, in civic organization and duties, and in physical training. The latter is especially necessary in connection with trades where the work is hard, confining and monotonous.

(9) Technical school work should, as far as possible, be arranged so as to suit the dull and busy seasons of the trade. In this way it will be easier both for the employers and for the workmen to make the necessary sacrifices of their time, without which the course will necessarily be ineffective.

SECTION 6: INFORMATION OBTAINED FROM MISS CARRIE M. DERICK, PROFESSOR OF BOTANY.

Those who go through the course, which runs 6 hours per week, get sufficient to enable them to teach in the schools of the Province. Forms of plant life, methods of nutrition and breathing, evolution of complex forms, etc., are taken up in the 3rd and 4th years; there is an extensive course for advanced students, 8 and 12 hours a week, dealing with plant life and evolution; a course for teachers, laboratory work and excursions, and a summer class with work bearing on Nature Study in schools; also a 4th year course for teachers of Nature Study. Students of Royal Victoria College can take Botany as an optional subject; an Arts Course can be taken without Botany.

Botany as such is not an essential part of general education but in so far as it helps appreciation of other things, it may be considered so. From that point of view everyone should learn Botany; it should be taught in the elementary schools in a very simple form of Nature Study, because it furnishes material eminently fitted to the simple sorts of lessons which arise in the school, and develops powers which need developing; plants are preferable to animals for this. Children should be taught to understand the principles of life as affecting sex, from an elementary point of view, and Botany can teach that as nothing else can; also it is necessary to know some Botany in order to appreciate the great theories of evolution which are based on it.

CHAPTER XXXIII: THE ROYAL VICTORIA COLLEGE OF MCGILL UNIVERSITY.

SECTION 1: INFORMATION OBTAINED FROM MISS ETHEL HURLBATT, WARDEN.

The Arts Course prepares for teaching, and offers substantially three-fourths of the course considered desirable in preparation for many other women's vocations.

The B. Sc. Course, with possible extensions, goes far to qualify women for specialized work as Chemical Analysts, Health Visitors, Sanitary Inspectors, etc.

By means of work now done in Pure Science, and by the development of work in the Department of Household Science at Macdonald College, McGill is preparing the essentials which will enable women to qualify in the higher study of Home Economics. If the latter is to be pursued as a University subject, it must be based upon a sound knowledge of the sciences upon which it founded, and teachers must be forthcoming able so to teach it. The latter are at present rarely to be found, and must be looked for among Science graduates who shall subsequently devote their attention to the study of Domestic Science.

About 100 students were working for degrees and 50 taking partial courses; some of the latter in teachers' classes. Not many are preparing definitely for professions; most of them take the courses for higher branches of culture. The College has no Department of Domestic Science. The work taken for degrees is practically such as those in Simmons College, Boston, preparing librarians and for higher secretarial work.

Summer Courses in Library Training are offered annually in the Redpath Library of the University.

The general training in language, literature and history helps in various occupations. Some active occupation in vacations might tell on general development, but it is difficult to know just what occupations would bear on the students' courses of study. They get much from activity during the session; what they need to gain from college work is the power of concentration, sticking to things, subjecting themselves to drill; this is the justification for compulsory courses.

A high matriculation standard is kept up here; no student is admitted who has not matriculated and means to take a degree course. The moral effect is very valuable; the College stands for a high type of work, and must use its endowment for that end.

If the special pursuits that enter into women's lives are given place in University training, they should be respected as of equal value and dignity. They should rank with complete studies in higher institutions, as education apart from utilitarian aspects. If they have educational value of a high order, they should

be included with immense advantage to the body politic, but should be taught on the strictest scientific basis.

If the College had enough money and teachers to put Household Science on the same plane as other college studies there would be no objection to having it. The teaching of fragments of cookery would not be college work; but bacteriology and physics and chemistry and finding the value of the oven would be. It takes a while to organize a body of knowledge, because people who have the practical knowledge have not had a sound scientific education. We need people who possess this to apply themselves to giving that knowledge the form for pedagogical uses.

College fees cover one-third of the expenses. The balance comes from endowment.

SECTION 2: INFORMATION OBTAINED FROM MISS SUSAN CAMERON.

MISS CAMERON is teacher of English at Royal Victoria College and also at McGill.

The chief defect in all students is bad speech, bad pronunciation and bad grammar. Slovenly, unfinished speech and writing are possibly due to haste, more often to carelessness. Most students have had a High School course. Compositions differ very much; some write better on personal and practical matters, while others prefer more literary or imaginative subjects. During the first year at the University an attempt is made to level these different impulses. Essays have to be written, and also descriptive narratives and records, describing experiences.

In early life all composition must bear on the child's experiences. When taught to read for the sake of reading, children do not miss getting control over language. Children can learn to express ideas up to the limit of their vocabulary quite fairly in four years. While it may be difficult to teach English to children in the ideal way, it is not difficult in itself; the correcting of bad speech is difficult, and needs constant diligence on the part of the teacher. If children's mistakes are corrected in early life, there is no need to do it later.

Teaching English as a subject connects itself with everything else, and it can be taught either by speech or writing. Our effort is to make students use words so that they express exactly what they mean. If grammar were not taught as an abstract subject it would be better; the rules should be constantly applied practically. In the University the aim is to teach English, to teach students to express themselves well, and at the same time to develop a kindly appreciation of the great things of literature.

It would be a very serious mistake to omit English as a subject; it would narrow the student's heritage and starve the imagination, besides limiting the vocabulary through lack of reading. A special course in English in some form or other is necessary; constant writing is needed, either in connection with history, literature or geography. Students are stimulated by reading masterpieces.

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This College has little formal training for public speaking. There is a voluntary debating society. Girls sometimes teach lessons, which is a help in that direction. Accuracy or inaccuracy in language reacts on other studies. A student who cannot express an idea clearly, and perhaps cannot carry out orders that are given, would not be an accurate worker. Discrimination in the use of language means clear thinking; therefore, a person who cannot speak clearly is hardly likely to be a clear thinker, while one who has learned to use words with care and to report accurately is probably more efficient in the world of feeling and society.

CHAPTER XXXIV: INQUIRY AT ST. HYACINTHE: A TYPICAL TOWN.

We give the following record, practically in full, of the inquiry at the Commission's sessions in St. Hyacinthe. This is presented as being typical and illustrative of the nature of the inquiry and the testimony submitted at other towns and places. (The Commission's records of its sittings at 100 places in Canada cover over 4000 typewritten foolscap pages.)

Names of Witnesses.

Paul F. Payan, Mayor, and Chairman of the Board of Trustees of the Protestant School.

Samuel Casavant, of Casavant Bros., Pipe Organ Builders.

D. T. Bouchard, Secretary, Canadian Pipe Organ Company.

Charles M. Hill, Branch Manager and Superintendent of Penman's Limited.

Hector Monet, representing the Organized Shoe Workers of St. Hyacinthe.

O. E. Dalaire, Director of the Dairy School.

Elie Bourbeau, Inspector-General and Instructor at the Dairy School.

J. de L. Taché, Director of the Quebec Dairymen's Association.

Monseigneur C. P. Choquette.

The session opened at the City Hall, on Monday February 13, 1911. at 2 p.m., about 40 or 50 people being present. Mr. Dutaud, (translator) read the King's Commission in French, after which the Chairman outlined in English the objects and scope of the inquiry by the Commission, Mr. De Serres repeating the explanation in French.

The first witness examined was Mr. PAUL F. PAYAN, Mayor, and Chairman of the Board of Trustees of the Protestant School.

Mr. Payan stated that he knew a good deal about the industries of the place, a list of which was sent to the Commission. St. Hyacinthe is a very suitable place for other industries not yet established there. One of the latest to be established is the new Organ Factory. Two of the Shoe Factories have been enlarged, to about one-third more than their former capacity. Skilled laborers willing to work can find employment the year round.

The city has not grown a great deal in the last 10 years, because of the fire a few years ago that depopulated the town to the extent of 2,000 and set it back; but it has got back to where it was.

There is no place in the town that gives Technical Education, except the classes of the Council of Arts and Manufactures. There are no schools where young men working at their trades would have a chance to improve themselves in these trades. There are very many boys aged between 12 and 15 in the town. Most boys from 14 to 18 have little clubs of their own, and enjoy their evenings

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instead of studying some good knowledge. They go to their little clubs and pass away their evenings in different ways—with cards or something. If there was an attractive school, with a laboratory attached to it, Mr. Payan thought they would take advantage of it. There is no public library; there was one 40 or 50 years ago, but it no longer exists.

If there were evening classes where young men, after they leave school and begin work, had opportunity or encouragement to continue their studies one or two nights a week, probably a good many would attend them. There is no such school at present.

Mr. Payan did not know of any place where the boys had Manual Training. He thought a good many children left school before 14.

Mr. Payan is a partner in the firm of Duclos & Payan, which carries on business in tanning and leather. Of the 150 employees, he did not believe a dozen were skilled. All the men who had learned the tanning trade had learnt it in the business, and the curriers also. Mr. Payan was willing to take on apprentices, but found they would not hire out for more than a week at a time, and left when they were not satisfied, so that there was no way of keeping them. He did not know of any classes that would help his workers to be more efficient, except more general education which would teach them to read, write, figure and think. Information about leather and hides would be helpful to them. Some employees cannot mix things according to any proportion, because they cannot figure enough. The tannery does not attract as good a class of labor as it might if it was clean work; the men have to work among wet and dirty hides.

A few of the employees had taken correspondence courses. The millwright in the shop worked with his father and took a correspondence course with the Scranton School as a draughtsman.

The boys have to leave the Protestant school here before 14, because it is only a primary school. There was a Model School when they had more children, but there are now only about 15 children. The boys leave at about 14 and go to Montreal to finish their education, unless they go to a Catholic College. There is no Manual Training in the school, and no sewing for the girls. This is the only school they can go to, and Mr. Payan thought it probable that Protestant people were kept from working in this town because there was no good school. Some foremen of factories had come enquiring about schools, and would not come unless there were good schools for their children; so that Protestant families with children are not attracted.

The total sum of taxes of the Protestant School Board is so small that they cannot afford to have a very good school. The Board gets a percentage of the taxes from the incorporated companies on the head of population, but there are very few properties belonging to Protestants in the town. Mr. Payan thought \$75,000 would probably cover the assessment that they had to draw taxes from. The Protestant Board only got its proportion from the corporations such as the Grand Trunk, the South Eastern, Ames, Holden & Co., and Penman's. Under the municipal law the owner of the property, not the tenant, determines where the taxes go. Property belonging to a Protestant contributes towards the maintenance of the Protestant school; Catholic property contributes to Catholic schools,

and there is a neutral panel, composed of the property of all corporations such as railway companies, and the taxes paid by these neutral panels are divided up according to the population. The rate on the \$75,000 of property is 50 cents on the \$100, so that \$375 is all that comes in for the school. The Board gets any fees monthly that it can, but some are so poor that it is impossible. To those that can pay, the Board charges 50 cents, and sometimes \$1 a month.

The Government grant is divided according to population, and Mr. Payan thought they got \$10 or \$12 last year. He did not think they had \$400 altogether for teacher's salary and maintenance of the school; in fact they are so poor that they have not got a school building, but use the basement of a church, which is nice and airy and makes a very good room. For some pupils no charge is made, others pay 50 cents, or 75 cents, and at the end of the year, if not paid, the Board has to pay the deficit.

They have a teacher with a diploma from the Normal School. When Mr. Bowman was here he wanted some of his children to be educated, so he helped the Commissioners, and they got two teachers, one with Model School diploma and the other as assistant; but now the Board cannot afford more than one, as there are so few children.

SAMUEL CASAVANT, representing Casavant Brothers, Pipe Organ Builders, examined, said:—

Our business has been established 31 years, starting with one man and now employing 140, having gradually increased all that time. Both of us are practical men. Our instruments are sold all over Canada, and some in the United States. The Customs duty is 45% on instruments going to the States, and our prices are somewhat above those of the American trade. This indicates that the quality of our organs is as good as those we compete with. We go over there and set them up. Of course the U.S. is not our field; still we get orders for large organs. At present we have an order for the Jewish Temple in Chicago for \$20,000.

Of our 140 men, I should say 75% have learned a skilled trade. We need work more skilled than cabinet-making, even in our woodwork. The men who make the lead pipes are all specialists. We have trained every one of those men. It takes 3 or 4 years before they can know their special branches, but we have to start at the very beginning with good cabinet-makers, the best we can find, and then they are trained through their specialties.

We always have a dozen apprentices or so. We have not enough apprentices to keep up our supply of skilled men. We have to deal with ordinary cabinet-makers, and we train them in one or two specialties according to our means. All our men are trained in Canada, except that we happen to have two strangers; it just happened that those two men asked for work, and we got them. Of course there is always room for improvement.

At present we have the School of the Council of Arts and Manufacturers, on the same footing as at Montreal and other places. This is limited to teaching elementary drawing. They practically only copy plans. Of course this keeps

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them in knowledge of drawing and how to read plans, but as regards the theory it is about reduced to the minimum.

Classes for technical tuition would surely do some good provided it is given in such a way that the boys are induced to go. We have to a certain extent trouble to keep up the minimum attendance. It goes all right in the fall when the course is opened; but now the men having families to attend and only the nights to do their small work, miss the school work, and sometimes we are obliged to close the class. I am not prepared to suggest what difference might be made in the course so as to attract those people to stay, but I am speaking more in a general way. Youngsters like amusement, and they have to deprive themselves of that if they go to school. About half a dozen of our men take correspondence courses.

I do not think it would be practicable to allow our apprentices to go to a technical day school 2 or 3 half days a week, because they would have to lose their salaries unless some special arrangements were made with them, and this would of course be a drawback. If there was a really practical technical school I for one would be very much in favor of helping the boys to go, and not cut their salaries entirely in any case, and possibly might pay them the whole of the salary if they were in earnest and seriously wanted to go. I would be strongly in favor of such a thing and would be disposed to assist all I could. I would surely allow a couple of hours twice a week, without cutting their wages at all. As to three half days, that is a matter that would have to be studied. As our business grows larger, it will be very important for us to have skilled and reliable men.

I am a member of the Council of Arts and Manufactures. For painting and freehand drawing, the majority of students are women and girls, with a certain number of young men. For architecture and mechanics the majority are men, working for wages in the day time, also boys about 18. We have about 20 pupils in architectural drawing and 15 in mechanical drawing. We had a class of between 10 and 15 in carpentry for a certain number of weeks, but we had to close it for lack of pupils. We have a little shop and tools, and we supplied the pupils with wood, and they were making miniature doors and that kind of thing.

About one-third of the whole class of men are taking lessons in design. It is now more linear drawing, and some of them will make plans of houses, but it is more to render them familiar with drawing; but we have several of them making drawings of organ pieces. We only have a couple of men in the shop who ornament the pipes. That work is done with stencils. We copy those designs; we hardly originate anything ourselves. The purchasers always leave that to our judgment. The colors of the organ are governed by those of the church.

Our ability to secure orders depends mostly on the quality and tone and general excellence of the products.

In the past 15 years there have been many improvements made in the building of pipe organs; 20 years ago what we call the pneumatic organs were hardly known in this country. We started to work and practically transformed organ building as it was heretofore known in this country. Besides that we have introduced different improvements such as adjustable combinations, and that sort of thing. The organs of today include many shades in tone as compared with those manufactured 20 years ago. We have both followed old makers and originated im-

provements ourselves. As regards mechanical appliances we have originated part of them; in tone structure we are governed by foreign organs, chiefly by England, which to our mind is the best country to be followed in organ building, as it agrees best with our tastes and temperaments here. We have no difficulty in finding all material to suit our purposes. The reeds we get mostly from the States.

An elementary course in music would not be of any value to our tuners. All our large organs are operated by electricity. We don't find difficulty in getting men to look after the wiring. We have trained all our men ourselves; in fact our shop is a technical school.

A knowledge of various woods, as well as of sound, contraction of materials, effect of climate on organs, would be very valuable to our men. It would surely do good to have schooling in those matters, for a man never knows too much. If a technical school were established here to train men in those things it would do good.

We do not necessarily restrict our cabinet-makers to one special sort of work; in fact we are obliged to teach them different branches in this way:—We take a good cabinet-maker and teach him one of the easy specialities, and then from that one he will jump into another one, and so on. Sometimes a man will have to be specialized two or three times. We start with a good cabinet-maker. The apprentices we take at the very beginning, and they go through different courses. The cabinet-maker has the advantage of having his hands formed, and he can make a good job of any mitre or joint, whereas the boys have to work 2 or 3 years before they get the proper skill.

Teaching boys in elementary schools to use tools, making their own drawings as a beginning, would give them a chance to do handwork in different shops, for boys will work with a machine 2 or 3 years and sometimes never get a chance for handwork at the bench. Handwork is what we taught in our school of carpentry, but the carpenters dropped off in attendance because they are employed all day, and when night comes they want to rest, or they have some other little duties to attend to.

The carpenters here work 10 hours. I could hardly say whether men working 10 or 8 hours a day would be most fit to take education at night. I have seen men working only 8 hours who spent the other two hours just about nothing; it would be an advantage if they were working.

D. T. BOUCHARD, Secretary, Canadian Pipe Organ Co., examined, said;—

We have been doing business about 7 months. I agree with what Mr. Casavant said about the need of skilled and reliable men. I think it is a trade that needs well trained men if we could find them. If any opportunity were provided for such training I think our company would be friendly to giving apprentices a chance to spend so many hours a week to learn their trade, because we make more money with people that understand it well.

It would also help us very much if we had public libraries with technical books, even if we could not have technical schools, because such books are very

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expensive for us, as we have to import them from the U. S. or England, and the men generally don't know English enough to learn from them. We have found when we have one of those men that has taken a correspondence course he is very much better than the others. It is only the elements the men could learn in technical classes, and if we had technical books in a public library I am sure they would have the benefit.

It is a very hard thing to say why the public library here was closed. There was a mutual society that had a kind of a library; it was not public; and when the club went down the books went to the National Society. I don't know why the Society shut up the library. The book cases are here, at the disposal of any man that would give the books. I hope we will have a Carnegie Library here.

CHARLES M. HILL, Branch Manager and Supt. of Penman's, Ltd., examined, said:—

We employ between 500 and 600 hands; from 60 to 65% are women. The factories here turn out knitted underwear and hosiery, flannel blankets, men's underwear and felts. We sell our output entirely in Canada, from Coast to Coast. We keep about 25 skilled mechanics for the repairing of the property.

We have no real apprentices; we have a few young fellows, but we don't bind them down for a number of years. We keep men coming forward; we start them at a low wage and teach them. I believe some are taking correspondence courses. If night classes were formed some of them would attend.

We have skilled men in every department, more or less. The weavers at the looms are not skilled, but the boss weavers are. We have no classes for those people, but there are places like the Lowell School, Leeds College, Boston Technical School, etc., that teach those things. They produce the foremen and the best men. A very large percentage of our men could take advantage of such classes.

Those textile schools are usually in places where there are several factories. If a foreman in a mill becomes a teacher a school like that could be started in a small way, and it would be very helpful here. We have some men in some branches that would be competent as night school teachers.

Men in England serve four years' apprenticeship in wool sorting, and then become journeymen; that is a trade in itself; so with the carding, etc. A general man to take charge of a mill is the most difficult man to get, because they usually go into some one branch and stick to that.

I served my apprenticeship in most of the branches we cover, in the mills. I took lessons in textile designing from a practical man who was also good with the theory, and I bought books and studied. I never got a chance to go to one of those textile institutes, because I was working all the time. If I had gone to those schools it would undoubtedly have been of great assistance in my present work. We have no such classes in Canada in the textile business where any instruction is given.

I think a certain percentage of our workers would be willing to go to night classes for two nights a week; but for one thing, their knowledge of English is not sufficient in some cases, and the lessons in those American schools are chiefly in English, and on that account they find it difficult to acquire knowledge.

We have not very many children working in our place. According to the Government requirement they have to be 14 years of age, and able to read and write; we examine them on those subjects. Not very many are found that are not qualified to enter our employment that way. There is not a factory inspector here.

We do not use much dye here in comparison with some textile mills, because our business is chiefly knitting, in which the color is a small per cent. We employ an expert dyer. He is an old man who has been about 30 years in this mill, and I think his knowledge is mostly self-acquired; I don't think he has had technical training. Of course we would prefer a man who had technical training in the first instance, but not entirely, for we prefer a man who has had both the technical and practical. It is very easy to spoil a lot of goods in dyeing. I don't know any place in Canada where practical instruction is given in the art of dyeing. When a Montreal or Toronto house wants an expert dyer they will send a man down to New York so that he can get a certain amount of training in the laboratories down there, which are generally in connection with houses where they sell the dye-stuffs. I know that many American schools teach chemistry in connection with dyeing. I know practically all the textile factories in Canada. There are some Canadians and some of all kinds among the dyers, but the chief ones I know are Scotch. Some have gone to schools in large textile centres where dyeing is taught, either in day schools or night classes.

I suppose it would be possible with our large system, to have some instructors, if the manufactures were willing. In the knitting trade particularly the need for instruction is not felt so much as in the weaving business. This is the only mill in our Company's hands that has both knitting and weaving, so in this plant we feel the need of skilled men, more than we do in any other plant.

HECTOR MONET, representing the organized shoe workers of Ste. Hyacinthe, examined, said:—

All the declarations I have to make are contained in this memorandum which I submit to the Commission. It represents the views of our organization as to Technical Education, and its advantages or disadvantages to us.

I have worked at the trade over 14 years. I got no outside instruction. I believe if we had received technical instruction we would have been in a position to fulfil our duty in a better way. I believe many of our workers would attend night schools if formed, because such instruction was requested by the officers of the Shoemakers' Union.

The kind of school kept by the Council of Arts and Manufactures here does not concern us. What we require here would be one giving special instruction in shoemaking. We could very well benefit by instruction in mechanics regarding

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the machinery used in our trade. Cutting also would be of some advantage to us in connection with pattern-making for shoemaking. There are classes for freehand and mechanical drawing in the school here. The latter would serve as a beginning of knowledge for cutters, but it would not be of any use in connection with pattern-making. I don't know any of our workmen who attend these night schools. What we would like is to have night schools which at the same time would teach reading and writing.

We say that there are several cases of child labor here, but I don't know whether they are of the legal age to work in industries or not. At least people say they are not. In this memo. we are asking that children be compelled to go to school till the age of 14.

MEMORANDUM FROM THE BOOT AND SHOE WORKERS' UNION. STE. HYACINTHE.
(Branch of the American Union.) *Translation.*

The Bootmakers' Union of Ste. Hyacinthe in reply to the request for suggestions as to the best means of promoting and developing technical and industrial education among the working classes, begs to submit the following:—

We beg the Government and Municipalities to establish in industrial centres, public libraries for the general instruction of the people; and further, that a part of the said libraries be specially devoted to literature of direct use to the workman.

In the less populous centres, where it would be too expensive to open a library, we consider that an annual grant should be given by the Public Authorities to properly organized Workmen's Clubs, which would enable the latter to provide themselves with the publications relating to their own trades and to keep themselves posted in the latest scientific developments.

We consider that more courses should be given in the evening schools, especially in the School of Arts maintained by the Provincial Government; that substantial prizes should be awarded to successful students in these courses, preferably in the form of scholarships to enable the children of workmen in rural districts to attend the large technical schools in the cities.

The Public Authorities should publish a Journal for Working Men, on the lines of the Journal of Agriculture, distributed free by the Provincial Government, giving all information on the industries followed in the country.

Lecturers should be provided to Workmen's Clubs, on the same lines as they are now sent to agriculturists, to give addresses, in addition to purely technical subjects, on law, hygiene and accounting.

As working men cannot afford to have their wages further reduced, we beg that laws be enacted to protect the fathers of families against the illegitimate competition of women's and children's labor.

We demand that education should be compulsory up to the age of 14 years, and that books be provided free.

Mr. O. E. DALAIRE, examined (in French) said:—

I am director of the Dairy School at St. Hyacinthe, and have occupied that office 4 years. No fees are charged to those who come to the School. The Provincial Government owns the property and meets all expenses. We give courses of instruction to butter makers and cheese makers; no others. We offer 4 or 5 courses each winter. The course lasts a month or 5 weeks. This Dairy School has been giving those short courses about 15 or 17 years. We don't offer courses to farmers' daughters for home dairying now; we offer courses only in what concerns butter and cheese making.

This winter we will have between 300 and 350 who take courses. Those men mostly all go back into cheese factories in this Province. We give them instruction in the testing of milk as well as making butter and cheese.

The inspectors of creameries and cheese factories come for instruction about every third year; there are 74 of them. A man cannot be employed as an inspector unless he has a diploma from the Dairy School. He might be an inspector for the Government, but it is understood that when all our butter and cheese factories are under syndicates those inspectors themselves will become inspectors of syndicates.

There is no law obliging the butter and cheese makers to enter into syndicate. There are about 2,800 butter and cheese factories in the Province of Quebec.

The farmers and cheese makers themselves value and appreciate the services of this Dairy School. If it was shut up 5 years I think it would be a very bad thing, for no country in the world can stop education for a while. There is still need for its continuance, to keep up our reputation and product.

The School costs the Government \$8,000 or \$9,000 per year. The value of the output of cheese and butter from the 2,800 factories in Quebec Province is about \$12,000,000; so the cost of the School would be less than one-tenth of one per cent on the value of the cheese and butter. The spending of that \$9,000 has been the means of increasing the money from the cheese factories and creameries.

Agriculture generally has been improved by dairying, because the farmers have kept more cattle and had more manure to enrich the soil. We expect to carry on dairying in every part of Quebec, as it is well adapted generally to our products. The going away of young people from Quebec is much less now than it was.

I hope that syndicate inspectors may soon be engaged by the Government; they are now paid about half their wages by the cheese or butter makers, and the other half by the Government, so they are not quite independent. We generally think that because of this they are not entirely clear of suspicion that they might favor certain cheese makers.

Some of our instructors visit dairy farms and give instruction when they think it is necessary to do so, and that is appreciated by the farmers, and often asked for. It is not sufficiently done now; it is now owing to the lack of money for the purpose; they go when asked for.

I have been interested in cheese and butter industries 17 or 18 years. The best butter and cheese of Quebec Province, as shown by the market price, is cer-

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tainly now equal in value to the butter and cheese of Ontario. I would say the cheese made wherever those 74 inspectors go. I suppose Ontario was for some years in advance as to quality, as shown by the market price; at least they said so; I was not sure; I know from what the paper said; of course I could not say whether that was actually so or not. I know that in many cases Quebec cheese was passed off as Ontario cheese, and Ontario cheese as Quebec cheese; and when it was good cheese it was generally passed off as Ontario cheese.

There is no reason now why our good cheese should be passed off as Ontario cheese, because since that time people have so looked after matters that we are now the masters of the situation. I am not ready to admit that our product was at any time inferior to theirs.

MR. ELIE BOURBEAU, Inspector-general and Instructor at the Dairy School, examined, said:—

I have been inspector since 1893; for 12 years before that I was making cheese. The Government pays the whole of my salary. In winter I superintend the instruction at the Dairy School. In summer I oversee those inspectors.

I have oversight of all the inspectors that do inspecting of cheese factories. They are employed by the factory men of the Province, who pay half of the fee, the other half being paid by the Provincial Government.

Their main duty at first was to detect fraud rather than anything else, but the last 10 years they gave more of their time to educating the makers than to detecting wrong milk. They spend their time now chiefly in inspecting. While they are called inspectors, they are really travelling instructors. I think the name should be instructors rather than inspectors; that would be a better definition of their duty.

Taking the cheese that used to come up the St. Lawrence River on the river boats and cheese that was sold on the wharf from the Lake St. John region and away down there, 17 years ago, I think there was at least $\frac{1}{2}$ cent per lb. difference in its selling price compared with the finest cheese from Quebec. We sold as low as $6\frac{1}{2}$ cents in the summer time. Last year the Provincial Government formed a Co-operative Society, and I have charge of grading the cheese, and I took some of the factories from every part of Quebec, and I showed some of the worst sections, e.g. Lotbinière and Rimouski and Chicoutimi, and the price that we got this year was a little over Brockville prices. I think the Brockville market is more even than any other in Ontario, because the other markets are smaller. When a buyer does not want cheese but wants to boom the market, he will go to the smaller market. I claim that Brockville makes a good even quality, and it is a very large market. This year we got beaten 5 times; we beat them 11 times; other times we were even, and so we are a little ahead of Brockville. As inspector I have to be a good judge of cheese.

Taking the quality of cheese at those factories where instruction is given compared with the quality 17 years ago, there is so great a difference to a man who knows the cheese business that we might say there is no comparison. In

those places I have spoken of they made the cheap kind, but now they are making the finest quality. There is no doubt there has been a decided improvement in the quality. That has also helped to establish the reputation of Quebec on the English market, for I went to England in 1900, and again this year, and we saw some Quebec cheese that was equal to any cheese I saw there. There is not so much variation between the different factories now as there used to be, though there is still some on account of some small factories being behind. When the cheese makers come twice to the School there is not much variation. I don't believe the cheese of Quebec could have held its own at all if there had not been some place to give the makers instruction. I believe they would have been out of business long before if they had not had the inspectors and the Dairy School whereas now the value of the trade is about twelve millions a year.

The farmers get a good deal more for their milk now than they did 15 years ago. I had a cheese factory in a parish a few miles from here and used to receive 3,500 pounds of milk a day; but when I left, with only 5% more patrons, I used to receive 12,500 pounds a day. The difference was due to the increase in quantity from each cow; they had about the same number of cows. They now grow more green fodder, and lots of silos have been built the last few years. They grow Indian corn of the early ripening sorts that make good ensilage. Not much alfalfa is grown in Quebec, because it has not been much of a success so far.

If the Government had contented itself with merely publishing bulletins and sending around lecturers to talk about the theory of making cheese, it would not have been as good as sending travelling instructors to the factories; and the supplementing of that by a Dairy School was also necessary.

I think the farmers could get as much good in their business in producing crops, by having competent travelling instructors visit them, as the cheese makers get. The prosperity of Quebec could be immensely increased if farmers could grow bigger and better crops. Such work has been done already to a great extent by agricultural lecturers, but it could still be improved. Before the Dairy School was started and before the travelling instructors were appointed there were a good many lectures delivered in Quebec, but they would not have done as much as the instruction of competent men who go and stay with men in their factories. The same thing would apply to farming to a certain extent. We had a lecturer that came along to the orchards to give information about the trees, and that was worth a great deal more than lectures.

J. de la BROQUÉRIE TACHE, examined, said he was the first Secretary of the Quebec Dairymen's Association from 1882 to 1891. Then he became a Director, and was such when the first Dairy School was built here. Much progress had been made in the quality of the cheese since then.

As Secretary, he came in contact with Mr. D. M. McPherson, who at that time owned a number of factories on the north and south shores of the St. Lawrence River. At that time he had taken the top prices for the Province with his product, and Mr. Taché found that he had had instruction from cheesemakers who

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visited his factories. In 1890 Mr. Taché put before the Board the importance of starting a similar system of instruction in the Province for cheese factories. Up to that time they had had very poor results from their Association, because some people who joined turned out very poor inspectors. At first the inspection was summer inspection, but only on the call of the factories, the inspectors simply going where they were asked. Mr. Taché suggested the importance of a system whereby the factories would pay half the expense, and that was started with a grant from the Government.

In the draft of the rules of the Association, the object of which was the training of inspectors, the idea was embodied of starting a Dairy School; 40 of the members formed a guarantee fund, and the Government gave a grant of \$2,000 for 10 years. The Ottawa Government provided through Prof. Robertson, with the cash at his disposal, to take care of the deficit in the Dairy School. The Association practically left the Dairy School to the control of a committee of 3 members, one appointed by the Federal Government (Prof. Robertson), one by the Provincial Government (Mr. Chapais) and one by the Association (Mr. Taché).

They were surprised when, instead of having few pupils, they had an average of about 250, which average has been kept up ever since.

There are now 75 syndicates. The first year there were 10, and the number has been increasing ever since. The Dairy School, which was a technical school, was founded with the idea of not receiving green hands at all, but cheesemakers. It is a trade and technical school.

Quebec did not suffer any damage and there was no interference with the control for Quebec and by Quebec people when the Dominion Government granted money at that time. Until 1893 sometimes they gave occasional grants; but the Dairy School proper had never been helped more than to the extent of \$4,000 or \$5,000 at the most for the first 12 or 13 years. "Prof. Robertson always did his best for us, and never interfered with the work, and the success was such that when we asked the Provincial Government to help us carry on the school, they said, 'We will take charge of it now'". Mr. Taché said that at the time he was very much opposed to handing it over to the Government, but he could not say now that he was sorry this had been done, because the work is still going on.

This important industry in Quebec decidedly could not have been developed as it has been, or could not have held its own against competition, without trade training or technical education. Similar means would have similar results here in manufacturing and in industries. That sort of education has not in any way interfered with the general education of the children of the Province.

In connection with the Dairy School they had always made it a point—and Mr. Taché had always striven for that point—that the teaching should be confined to the very line in which these men were earning their living. He was opposed to giving agricultural courses at the Dairy School, because he knew that the men attending there had enough to do in their own line without grafting agriculture on to it. Probably 95% of the cheesemakers are not agriculturists themselves, and are not in a position to appreciate what would be given them in agricultural education.

Mr. Taché thought that courses in the same line as those in the dairy school—short winter courses—given at convenient centres, would be equally useful to the farmers as applied to their own occupation. A large number of people are in agriculture who are absolutely devoid of means of culture, and no doubt an efficient school is very much better than any reading a man can do for himself. In addition to those short courses for farmers, there is need for and would be advantage from travelling instructors visiting chosen farms, in the same way as those inspectors visit the cheese factories. Mr. Taché's idea was that those short courses would be given practically by instructors who would give practical illustrations, and those would be carrying on that sort of work in the winter first in centres, and then in summer time on the farms themselves. Mr. Taché thought that would be indeed a good thing to have done in the Province.

Mr. Taché, being recalled near the close of the session, said:—Following the discussions, and the information that was submitted before this Board, I think it my duty to submit to you a schedule which happens to be in my hands, indicating the distribution of the 460 pupils of Girouard Academie, a municipal institution of our city. The course of this Academie is spread over 8 years. The 460 pupils of 1910-11 are apportioned as follows between the different classes: pupils of the first year, 150; second, 98; third, 88; fourth, 79; fifth, 33; sixth, 21; seventh, 7; eighth, 4. I must add that the Brother Director, when I applied to him for the distribution of pupils, told me that one must not conclude from the above that all the pupils give up schooling in proportion to the numbers of such schedule, because a certain number of pupils enter the Seminary at St. Hyacinthe in order to follow classical education, or enter the Commercial College belonging to the same order. At the same time he regrets very much to observe that notwithstanding all the efforts to keep pupils at school for a greater number of years, parents do not seem to sufficiently appreciate the importance and reasons which ought to induce them to leave their children at school. The Brother Director told me he believes that the great inducement of earning money offered to the children is perhaps the principal reason which causes them to be withdrawn from school before having remained there sufficiently long to complete the course of study. This would lead me to think that a certain number of children, notwithstanding the declarations of the manufacturers, enter the factories and various industries before attaining the age of 14, in the same way that they enter the employ of different classes of people.

Regarding libraries, I think that everyone is agreed that a technical library placed at the disposal of our workingmen in the different trades would certainly be useful and desirable. The only danger the Catholic population sees in it is that very often these libraries comprise subjects absolutely outside special lines attributed to them.

MONSEIGNEUR C. P. CHOQUETTE, examined (in French) said he had been in St. Hyacinthe 41 years, and had seen many industries follow each other here. In his opinion it is important to the people that the young people should have

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opportunity of being trained industrially and with technical knowledge. The question of how young men past 14, who have left school, should be induced to spend some evenings in the week in training is really an old question that pre-occupies nearly every great teacher. Mr. Taché is in a position to give you statistics showing that four children attend school till 10, 11 and 12, but they don't afterwards follow the classes in institutions such as academies or model schools.

As to institutions of what may be called superior education, or intermediate or secondary education, specially adapted for those who are to follow the industries, such as are provided for those who are to follow commerce or the professions, he did not know any except the one in Montreal that Mr. De Serres is looking after, or that kept by the Council of Arts and Manufactures, specially connected with Manual Training.

It would be an excellent thing, if possible, to have schools, similar to those for commerce, with an equal part of the time given to work with the hands, tools and materials, to qualify those who are to engage in industries. Then a young man who has followed even the commercial course, would look a little higher towards technical work, and would take pleasure in work of that kind; but he would require larger wages than are paid at present for a man of his qualifications.

It will require large wages to hold young men who have that higher technical education, and Mgr. Choquette feared there would be no situations for them in this country. He believed the Commission ought to find a method of giving more importance to technicians. It is unfortunate in our country that pupils leaving technical schools are not rated at their value. He believed it would be the Commission's principal function to obtain for such instruction the recognition which belongs to it. That would be a great benefit. Take for example the dyeing industry, or where chemistry plays an important role. In such industries only pupils from Universities or technical schools are admitted. In the leather industry it is the same thing; experts are required. Frequently we have men well disposed, but without qualification, who have no practice. In regard to dairying, the inspectors ought to be able to appreciate the quality of the water. Here again technical training is not sufficiently reckoned with. To sum up he would say, "Open careers for young technicians and you will have technicians, and pupils in technical schools." He thought that such young men who have missed opportunities quite young would go to evening classes when they realized that they are missing many things. When aged only 12, 13 or 14 they do not think of anything more than play.

If boys, going to school until they are 14, had a good deal of Manual Training and handling of tools and materials and making drawings during the last 2 years, he believed that would help to indicate occupations they could go into, and make them enjoy them. He would consider that a pleasure to himself. Some of the so-called classical colleges in this Province have tried that. He knew of at least two that had a working shop close to the college, and the students were allowed on holidays to work there; but he noticed they were closed, and deserted. He did not know why.

Mgr. Choquette did not know whether there would be any difference in the love of a boy for taking tools and materials in his school years between 12 and 14 and 16 and 18. If it were a question of directing him to some career or some

way of working, if taken at 12 or 14 years he would have a chance to change his mind.

He thought it advisable that craftsmen should have a technical education of the lesser degree that would help them considerably. For instance, a plumber should know the elements of hygiene and sanitation; a carpenter should know the strength of materials that he uses. In the United States engineers were turned out in great numbers when electricity became popular, and those engineers at first obtained big salaries; but to-day they are so numerous that they have dropped to the level of minor employees. Apart from the salary, of course, there was satisfaction, another aim of education.

He wished that it were possible to start here an institution that would give night classes for instruction in science and art—painting is there already—not for the purpose of training technicians but for the purpose of developing taste and intelligence.

Schools or classes where there was more hand work, more tool work, would surely induce boys to seek more education who now never go into secondary or superior schools at all. To help those who are going into industries to become skilled craftsmen would be greatly desirable if possible, and he thought this might come little by little; it would be a kind of tradition, and they would like it. The trouble now is to bring boys to evening schools. If there was something that would catch their attention, such as some courses of applied chemistry that might be mixed up with some other subjects, he thought they would come.

MEMORANDUM FROM THE CHAMBER OF COMMERCE OF STE. HYACINTHE, QUE.

Translation.

(Submitted by Mr. Bergeron.)

The Council notes with regret that the industrial and commercial firms of the city of St. Hyacinthe find it almost impossible to obtain among the young people leaving our schools, academies and colleges, any who have sufficient practical knowledge of affairs to make good employees, or who, after a reasonable length of service, are able to go into business for themselves. The best of them have their heads full of confused ideas which they are unable to apply in practical life, and very few of them can even write passably well the most ordinary business letters.

This Council is of the opinion that this state of affairs is due to the fact that the instruction is not sufficiently practical, and that memory is too much developed at the expense of individual reasoning. One of the principal causes of this deficiency is the lack of practical knowledge on the part of the male and female teachers of the Province. The majority of our teachers of both sexes are most worthy people, inspired with the desire to do good, but, by reason of their condition or social position, they know nothing of practical affairs, and have no personal experience of the problems confronting a young man when left to himself.

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The Council of this Chamber of Commerce thinks that it would be advantageous to procure for the higher classes, by means of adequate salaries, men who have been accustomed to practical life. In order to secure competent teachers, the Government should fix a minimum salary and insist upon a reliable certificate of efficiency. This Council also considers that the Government should reduce the expense of primary education, either by arranging for uniform books, by distributing them free of charge, or by printing the books themselves and selling them at cost price.

Attendance at school should be compulsory up to the age of 14. This would materially improve the quality of our workmen, among whom there are unfortunately far too many who can scarcely read or write, and who can never aspire to become leaders of industry.

This Council would be very pleased to see the Government and municipalities establish free Higher Commercial and Technical Schools in populous centres, under the direction of experts, at which the sons of business men, workmen and agriculturists could obtain practical instruction which would put them on an equal footing with the young men of the most progressive countries.

This Council also notes with regret that those of our young people who wish to study the subjects relating to their occupation are unable to do so in the absence of a free public library at which they can obtain practical books to help them. This Council expresses the hope that our government and municipalities will establish as soon as possible, public libraries containing technical books.

CHAPTER XXXV: STATEMENT ON BEHALF OF THE SHERBROOKE BOARD OF TRADE.

One of the most serious aspects of the educational question as seen by us, is that of first securing the attendance of the children at our elementary schools. To an extent which is a menace to the character and ability of our future citizens there is a marked disinclination on the part of parents to send their children to school beyond the most elementary stages, while there is an appreciable number who are indifferent to the educational training of their children altogether. In our opinion this is to some extent due to the defectiveness of our school law, which does not provide for the compulsory attendance of the children of school age, although it does enact that the monthly school fee "is exigible for each child from seven to fourteen years of age, whether he attends school or not; unless exempted in virtue of article 249 of this act". (See Sec. 13, Art 247 of the Educational Act). The article furthermore provides that no child from seven to fourteen years of age shall be excluded from school for non-payment of monthly fees. The child admitted under this condition, however, would, under the terms of Art. 249, be practically admitted as a pauper scholar, and as such would be placed under a disability in his relations to the other scholars.

(1) We would suggest that the most practicable way to remove the existing conditions is to make education free and compulsory in the Elementary and Model grades, and that, if feasible, it should be extended to the Academy grades. We believe that the educational facilities and advantages offered by the schools of our province should be equal at least to the best that are in existence, and that the resources for such schools ought to be commensurable with the demand for them. A wider recognition on the part of the Government and the municipality of this demand would awaken a sense of responsibility for the creation of a compulsory school system.

One of the results of the imperfect preparation for their life's work is that when the boys are apprenticed it is found by the foremen that many of them are incapable of working the comparatively simple problems in arithmetic as required by their trades.

(2) We would respectfully suggest that the text-books used in our schools should be uniform, and that they should be changed only when the new books are decidedly superior to those already in use. There have been complaints from parents in the past, because of the frequency of the changes; while dealers have asserted that they run a risk of financial loss by overstocking in text-books that are liable to be changed before the next school-year. It has been asserted, with what degree of truth we are unable to ascertain, that the changes are sometimes due not so much to the superior character of the new books as to the influence that the authors and publishers can exert in the proper quarters. We would recommend that books used in our schools be selected for their merit only, and

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that only after a comparison with the very best text-books used in other provinces or countries.

In this connection we would urge the advisability of inaugurating a series of Inter-Provincial text-books, so that scholars who go from one province to another shall not find themselves at a disadvantage, as they so often do under the present system, when beginning their work in the schools of the province to which they go. Moreover, such a system would facilitate in a large measure the work of students who are preparing for careers in government schools, Military or Naval.

In respect to the uniformity of text-books we would point out that there ought to be no insuperable difficulty here. What has been found beneficial in the Western Provinces of Canada ought to commend itself to the judgment of the educational authorities of this Province and by careful discrimination be effected by them.

(3) We believe also that the time has come for the School Boards of our municipalities to supply all books and school supplies to the pupils free of charge. While this may present itself as a very radical recommendation we would remind your honorable body that where free text-books are supplied the results have been very beneficial. We have already referred to the disinclination of some parents to provide an adequate educational training for their children. While this may be due in part to the indifference of the parents to the advantages accruing from such training, it is also due to some extent to the fact that the cost of books and supplies is frequently a serious burden for those whose incomes are very small relatively, and acts as a deterrent in continuing their children at school. Especially is this the case where the family is large.

Should it not be deemed advisable to provide free text-books and supplies, we would suggest, as an alternative to the present system of purchase by the scholar from the dealer, that the School Board in the municipality or district supply all the necessaries to the children at cost price, thus eliminating the middleman's profit, which would mean a material lessening of the expenses in this particular where several children are in attendance at school from one family.

Another advantage to be secured from the adoption of such a system would be the supply of books without delay to the scholars. Under the present system scholars are frequently placed under a disadvantage in beginning the school year, because an adequate supply of books has not been ordered by the dealers. These excuse the shortage on the ground that they want to avoid overstocking.

(4) We believe that the establishment of Manual Training and Domestic Science classes in all schools where the attendance is large enough to warrant undertaking this work should be seriously considered. Through such classes the interest of the scholars in the other departments of their work would be maintained. It is unnecessary for us to point out the advantages derived from this feature of modern educational methods, but we would lay emphasis upon the fact that not only does the system of Manual Training promote manual dexterity, but serves to retain the scholars for a longer time in the school to receive the necessary training for their life's work.

Speaking for one of the richest agricultural districts, of which this city is the centre, we would suggest the establishment of schools for the teaching of agri-

culture in the rural districts, within a certain radius and population. By the establishment of such schools we believe that the interests of the sons of farmers would centre far more in the farm and that the large exodus from the country to the city would be considerably lessened. We would suggest that such schools should be under the joint administration of commissioners from both panels, since there should be nothing in those schools over which difference of opinion in religious matters ought to exist.

(5) It is the opinion of the members constituting this Board that our schools should provide a more thorough training in penmanship. The defect in this particular is very marked at present. Every teacher should be required to pass an exacting examination in penmanship before being granted a diploma to teach, for, excepting in schools where a specialist is engaged to teach this important subject, the scholar is dependent for his instruction upon the qualification of the teacher. The demand for good penmanship is insistent in the case of those who are looking forward to a business career and must be met.

(6) One of the most serious aspects of the educational question as it appears to us to-day is the lamentably small number of men who are teaching in our schools. In this city, with four schools under the Protestant Commissioners we have only one man, who is principal of the High School. In this particular we are probably no worse off than are many other towns with the same Protestant population. But this fact does not afford us much consolation. We believe that it is necessary in the interests of the boys, and ultimately in the interests of the community, of which they form part, and whose future will be largely in their hands, that more men should be induced to enter the teaching profession. We believe that the best interests of boys would be served if they were entirely under the supervision of masters, after they are twelve or thirteen years of age. They need more masculine influence over them, providing, of course, that it is of the right kind, both in the schoolroom and playground. The boys are practically left altogether to themselves on the playground. It is there they often need instruction in and exemplification of the principles of honor and fair play, and such would be authoritative coming from a master. The Canadian boy is in danger of losing the true ideal of sport because he is too often obsessed of the idea that the necessary and all-important end in playing a game is to win. This danger might be averted by proper training on the playground. To sum up this particular aspect of the question: we believe that there exists a need for organized play in our school system.

(7) The question of inducing more men to go into the teaching profession resolves itself largely into a question of providing adequate salaries for them. But it is even a wider question than this. Not only must we face the question of higher salaries for men, but also for women. The present standard for this province can be characterized only as disgracefully low. Unless it is very materially raised we cannot expect to maintain schools that shall meet the requirements of the age. We wonder that so many enter the profession, both men and women, and that the standard of excellency among them is so high. They deserve better treatment at the hands of those of us who have sufficient confidence in them to leave our children under their training and influence twenty-five hours a week, for forty weeks in the year.

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(8) We believe that the time has come for the general establishment of a system of compulsory medical examination, especially with reference to the eye, ear, nose throat and teeth, for all scholars attending our public schools. Observation makes this necessity very evident. In all schools of any considerable number of scholars, there is always a percentage who are suffering from some physical defect, of which sometimes their parents are unaware, and the teachers are unable to do anything in the matter, should they notice the condition of the defective children. In New York, and other places where this system is in practice, and where schools are specially provided for "defectives", the benefits to those handicapped children have proved immeasurable. Moreover, such medical inspection would to a large extent avert the epidemics that frequently invade our schools, through the lack of proper safeguards in the interests of all the scholars.

(9) In this connection we would also suggest, as far as possible, the general introduction of some form of calisthenics. In the large schools there should be a gymnasium provided under the direction of a competent instructor. Where such equipment is not feasible, as in the small schools, simple exercises of one of the many excellent systems now in vogue might be given under the direction of the teacher. Such exercises, we are convinced, would do much towards maintaining the physical efficiency of the scholars.

(10) We would suggest in connection with our elementary school system the opening of night classes for those who are above school age and who are engaged in some form of employment during the day. The need of those classes is felt by those who have not received a sufficiently thorough elementary education among our own young people, and also by the immigrants who not only need instruction in the elements of education, but especially in the English language, where they are of foreign birth.

(11) Coming now to matters that are of specific local importance, we would draw your attention to the need of a separate and adequate building for the higher grades of our Protestant schools. Our Academy or High School work is carried on in a building which has beneath its roof every grade from the kindergarten to the A. A. Classes, and the Principal of this school has to divide his time between all the departments. We believe that better efficiency in this department could be secured by giving it the distinction of a separate building and staff. It is a very regrettable fact that a large portion of our scholars who might easily continue their schooling cut it short of the higher grades. If the High School were properly housed and supplied with teachers who could give all of their time to its work, it would doubtless appeal to a larger number of the scholars. At all events we ought to have a High School here that would attract a large number of students from the surrounding country.

(12) Finally, we need a thoroughly equipped Technical School here. We are the centre of a population of about 200,000. Within a radius of relatively a few miles we have various mining industries, while in the city our manufacturing interests are increasing and developing to an extent sufficient to warrant the opening of a school in which our young men could receive a thorough training in mechanics and allied subjects. The classes under the Council of Arts and Manufactures have done good work for many years, and are still pursuing their course

with gratifying results. But the time has come when there should be a more adequate attempt to meet the needs of our city, and surrounding country, and we believe this can be done most effectively by establishing a school for technical education.

Funds for the support of public schools in the City are raised as follows:

	Protestant Panel	Catholic Panel
Taxes.....	\$15,350 00	\$16,000 00
School Fees.....	2,972 00	1,700 00
Government Grant.....	543 00	1,050 00
	<hr/>	<hr/>
	\$18,865 00	\$18,750 00

The foregoing report applies particularly to the Protestant Panel, although it is entirely acceptable to the Catholic Panel, with two possible exceptions, namely: Compulsory Education and the Uniformity of Text-Books. But several Catholic members of the Board have expressed themselves in favour of compulsory and free education.

CHAPTER XXXVI: MEMORANDUM FROM THE MAYOR OF VICTORIAVILLE, QUE.

In small manufacturing towns where many men are employed, and where a large number of girls wish to work but cannot find employment it has been suggested that companies should be formed to develop the ready-made clothing industry and thus furnish work to these girls.

We find a sufficient number of girls for the secondary work, but have great difficulty in finding highclass men for the difficult work. We are thus compelled to train these employees at great expense, or else to seek them elsewhere, and even so, we have great difficulties to contend with, as this industry is partly controlled by the Jews; consequently this industry becomes concentrated in the large cities, to the detriment of our smaller towns. However, if our Government would give us a technical school at which tailors who have already served a certain apprenticeship could learn special branches of their trade (for there are two distinct sides to this industry, the practical tailoring and the ready-made), this would be a great help. In one or both branches of this trade we are behind our neighbours in the United States, who have the advantage of the technical schools, at which the theory and practice of tailoring are taught, as well as making up, which latter is our chief lack in the ready-made trade.

The Government would render a great service to Canada, and particularly to the Province of Quebec (since this industry tends to develop chiefly in the small towns of our Province) by establishing one or more of these schools where young tailors could perfect themselves in the art of tailoring, and especially in making up garments.

CHAPTER XXXVII: TRAINING FOR THREE SPECIAL INDUSTRIES.

SECTION 1: THE CANADA PAINT COMPANY, LIMITED, MONTREAL.

MR. ROBERT MUNRO, President and Managing Director, writes:—

Our business, which is the largest of its kind in Canada, is devoted to the following industries.

1st. *The Manufacture of Mineral Pigments.* For this purpose our plant at Redmill, Que., uses bog iron ore (surface and sub-surface) which is made into Reds, Browns, Purple Browns and Purples for all descriptions of outside painting, especially for roofs and freight cars. We also mine, in New Brunswick, Graphitic Shale and manufacture it into Graphite Paint for bridge and other iron structures. In the same Province we are also mining Sulphate of Barium, (commonly called Barytes) which is used as a base in our Chemical Color Department and also for cheaper paints.

2nd. *The Manufacture of Chemical Colors* from the essential chemicals which are imported free. These represent Chrome Yellows, Greens of all kinds, also imitation Vermilions, and Red Lakes. These are developed in great variety, mainly for industrial paints.

3rd. *The manufacture of Varnishes, Japans and Dryers.*

4th. *The preparation of Linseed Oil from Flaxseed.*

5th. *The preparation of White Lead, White Zinc and other Paints.*

The foregoing are supplied to the general painting trade for household use, but more especially for use in the industrial arts, especially by such companies as manufacture agricultural implements, carriages, pianos, furniture, wagons, etc.

A large proportion of these paints are sold in liquid form (ready for use) and it may be interesting to the Commission to know that the greater portion of paints manufactured and sold in Canada is of a high class. The intelligence of the people contributes to this as they generally understand that the best are the most profitable. Legislation in this regard is more advanced in Canada than in any other country, inasmuch as we have a clause added to our Adulteration Act forbidding the marking of White Lead as "Pure" unless it is absolutely so. The British people have endeavored to secure this through their Trade Marks Act and have had a measure of success, but the result of this legislation in Canada is that over 80% of all the White Lead sold is absolutely pure.

The manufacture of *Paris Green* for the potato bug and tree spraying is quite an important item of our manufacture. The Dominion calls for about three hundred tons of this necessary product per annum, the expense to the agricultural community being about \$120,000 per annum.

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The chemical section of the evening technical classes is appreciated by our employees and will be increasingly taken advantage of.

SECTION 2: THE C.P.R. SYSTEM OF TRAINING APPRENTICES.

The Canadian Pacific Railway Company inaugurated at their Angus shops, Montreal, a system of training apprentices. This includes a course of theoretical instruction in a class connected with the works. The training is progressive, starting first with general educational instruction for the young employees, then advancing to shop and technical instruction, and finally to educational facilities for journeymen which enables them to qualify for minor positions on the staff.

There is no night work in connection with this course, the classes being held during the Company's time, and apprentices being paid as if at work in the shops.

For two or three years the Company ran evening classes for their journeymen, but this work was eventually taken over by the Council of Arts and Manufactures.

The primary education for young employees consists of (1) Reading and Writing; (2) Elementary Arithmetic; (3) Geography of the C.P.R. system; (4) Biographical Sketches of past and present eminent Canadians; (5) Freehand Drawing; (6) Punctuality and Regularity; (7) Thoroughness, Application and Self-reliance; (8) Cleanliness and Thrift; (9) Recreation.

The young employee, after he has received the above training, is put through courses of instruction in shop arithmetic, shop mechanics, shop practice and mechanical drawing, which enables him upon completion of his apprenticeship to qualify as a skilled mechanic. Then, if necessary, he may take advantage of the advanced classes in mechanics, electricity, locomotive and car construction, and workshop practice.

The young clerks in the general and other offices at Montreal have equal opportunities with the apprentices in the shops for equipping themselves for their life-work. Schools of Telegraphy and Shorthand have been in operation for some time, and the advantages they offer are being eagerly seized by a number of ambitious youths.

The Company also provides instruction cars with competent men in charge to give instruction in the mechanism, operation and care of the Westinghouse Air-Brake, steam heating and safety appliances. One of these cars is employed on Western lines and another on Eastern lines.

INFORMATION FROM MR. LACEY JOHNSTON, ASSISTANT SUPERINTENDENT OF MOTOR POWER.

In the Angus shops there are a good many departments, and a regular course of instruction through which the apprentices are put. It has really become a department, and was in charge of a graduate of Cambridge University. For 250 apprentices, he has under him 3 technical and 7 practical shop instructors, the

latter having been taken from the shops—expert men that have shown themselves by their daily work not only expert but able to instruct boys in the work they have to do. The salaries of these instructors are paid entirely by the Company.

Before the boys enter the works as apprentices they must pass an examination on Canadian Geography, Railway Systems, Arithmetic. The applicants take the examination in French or English, according to their nationality. On passing, they fill in a form, and when a vacancy occurs in the shop the boy wishes to join, he gets Mr. Johnston's approval, and is sent to the shop.

When a boy becomes an apprentice, if French he gets class instruction in English, to enable him to mix and converse with the men and boys in the shop. After a French-speaking boy gets away from Montreal or Quebec it is as necessary for him to know English as to know his trade. English boys brought up in Montreal as a rule understand a little French, because they have mixed with French boys at school. If a boy has been brought up in English, he chooses whether he will learn French or not. Thus there is enough French, and there is no need to teach it. In the car department probably 75% are French. English is taught to the French boy because he is to work in an English-speaking country. He is being taught for the whole system, and would be at a disadvantage if he did not know English.

After a boy has been accepted as an apprentice, instructors working about in the shops with the boys take hold of them and teach them the proper way to handle their tools and set up a machine, how to fix it, and the best way to handle work when it is in the machine, etc. There are instructors in all the different departments to teach the boys, independent of foremen and workmen. These men have nothing to do but instruct the apprentices in their group; they are practical mechanics, chosen because of their fitness for the position.

The boys serve from 4 to 5 years as apprentices, and their whole course of instruction and work is planned out for them from the day they enter. The shop instructors have a regular schedule by which the boy is moved from one department to another. After he has been in such a place for 3 months, he is moved to another place, so as to give him a general understanding of the work.

In addition to all this shop work, the apprentices get a little elementary education which enables them to become general mechanics. The aim is not to make either steam or electrical engineers of them, but rather to make them good intelligent mechanics. To this end the schedules show when they are to be moved from one place to another, and the man in charge is held responsible for seeing that the boys are moved from schedule to schedule. Human nature is the same all the world over, and the tendency is that if a man gets a boy who shows himself very apt on certain work, to keep him at it to the boy's disadvantage, but the Supervisor steps in and says, "Here, that boy is due to move to such and such a place", and he has to go. The shop instructor is under the Supervisor of Apprentices.

All boys have also to spend two hours a week in the instruction room, and there is a schedule drawn up for that. Boys go in certain groups and on certain days, as not more than 20 are taken at a time.

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The shop instructors do not leave the shops, but there are instructors in the drafting room for the purely technical side of it. In the last 6 or 8 months a little change has been made, so that instead of taking them in the technical work they are taken in the practical work too; they have a hammer, chisel, and vise there, so that when they go into the shops they are not altogether green on it. If a little shop work were taken in our schools, it would relieve the instructors of this. The boys in the High School who are taught Sloyd work, are able when they come here to go ahead with hammer and chisel, and thus save all the time in this work for more advanced work. Consequently they go more easily through that advanced work. These boys would be very apt to get a scholarship under the Company's system, because they are advanced beyond the other boys. So far very few boys have come into the shops who have gone through the Manual Training schools in Montreal.

In the instruction room the 3rd, 4th and 5th year boys are grouped under different grades of instruction to suit their different years. Boys have an opportunity of passing an examination at the end of every year so as to pass from one grade to another.

The 6 boys who pass the best during the year get scholarships. Those boys who are practically out of their time, but are backward and not able to take the advanced course, get scholarships after their time to keep them in this class and bring them up to the boys who have had better advantages. In addition to that, the directors of the Company give two scholarships at McGill for some of their workmen.

Until this apprenticeship system was established, the Company used to get a very poor class of boys, simply taking them because they were the sons of workmen, or something of that kind. When Mr. Johnston came here, he found a class of undersized, weakly little boys that could not do a day's work under any consideration. Then there were a lot of boys who were thrown in there by their parents to get rid of them and earn some money. Now the boys are picked, and there are plenty on the waiting list, so that they are getting a different style of boy altogether; consequently they will get a different stamp of mechanic. The work the boys are doing in the shop can be traced accurately, which heretofore was never attempted; consequently it is known that the Company gets compensation for the work of the apprentices.

The advantages of this system are found to be very great when the apprentices become journeymen. Of course a large proportion of them always go away to other shops, and some go out of the machine work. Even if they are not filling railway positions they are filling positions that railway men would have to fill, and it is no loss to the Company. The Company rather likes them to go out and get experience in other shops and come back. In nine cases out of ten they return and bring back special ideas for the shop. The Company looks upon it as a winning proposition all around.

Boys are not indentured, but there is an agreement signed by the parent and the boy, undertaking to abide by the rules.

The journeymen do not need more than they have now the opportunity of getting. For two or three years classes were run for them, but this work has been

taken over by the Council of Arts and Manufactures, and the Company advised its men to attend their evening classes. Some of the men have won medals in these classes. There are several men holding positions on the road who went through McGill University, and they are useful for carrying out tests, etc.

The Civil Engineers do not come under Mr. Johnston's department at all; that is an entirely different branch.

Large numbers of McGill students come there during the vacation for practical work. They are put into the shops and paid like ordinary workers. All who come can be accommodated, and they usually put in 2 or 3 months.

The output of the shop is better because of this system of instruction, because the shop work is done more intelligently. Other manufacturing concerns, in Mr. Johnston's opinion, would get the same benefit from such a scheme, and it would be a decided advantage if it became general all over the country. The smaller manufacturers could not do it, but if there were schools in the neighborhood that their men could attend, it could be managed. Some men and boys are not very keen to go to evening school, but the more ambitious ones would avail themselves of it. If they went in the employer's time, some time would be lost in getting to and from the school, and if 100 apprentices from 6 factories were to attend, this loss would be appreciable. If it were taken once a week, time would be saved, and that would be satisfactory. The smaller concerns would thus be put on an equality with larger ones, and probably many boys would attend.

Mr. Johnston stated that they had to keep quite a strict discipline on their boys. He was willing to be quoted that the training of the apprentices is a proper and profitable piece of business management. He was prepared to stand by that.

ORDER OF TALKS ON SHOP WORK FOR APPRENTICES IN THE TOOLMAKING, BRASSFINISHING, STEAMFITTING AND MACHINIST TRADE.

- I. The use of hammer and chisel and the reading of the shop scale.
- II. The use of centre-punches, scribes, dividers, inside and outside callipers, squares and straightedges.
- III. The handling of all classes of wrenches and spanners.
- IV. The use of level, plumb-bob and surface gauge.
- V. Description of the Drilling Machine and the manner of setting up work on the machine.
- VI. Rose-bitting, reaming and counter-sinking.
- VII. Handling of taps, stocks and dies.
- VIII. Classification and use of files.
- IX. The use of scrapers and hack-saw.
- X. Description of the Shaping Machine Shaper Tools and method of setting up work in the machine.
- XI. Description of the Slotting Machine, Slotting Tools and method of setting up work in the machine.
- XII. Description of Planing Machine, Planing Tools, and method of setting up work on the machine.

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- XIII. Description of the Milling Machine, Milling Tools, and method of setting up work on the machine.
- XIV. Description of the Lathe, Lathe Tools and method of setting up work on the machine.
- XV. Description of the Grinding Machine and its uses.
- XVI. The reading of Micrometers and Vernier Callipers.
- XVII. Laying-out of work on the marking-off table.

SECTION 3: DOMINION BRIDGE COMPANY'S CLASSES FOR APPRENTICES.

This Company established night classes for their employees. The first year the courses were structural drawing, mechanical drawing, and arithmetic, but the two latter were discontinued as they did not prove popular among the men. The structural drawing was a complete success in regard to the number of pupils and results obtained.

MR. H. J. GRISWALD, the Assistant Superintendent, explained that the establishment of the classes was a purely commercial proposition from the Bridge Company's point of view, as were all schools carried on by Corporations. They were running the night school because they needed the skilled men; and the man who could demonstrate in the school that he could "deliver the goods" was promoted by the Company. The most important positions in the shops were the most difficult to fill.

YOUNG MEN BENEFIT BY CLASSES.

The bulk of the young men were eager to take up the classes, said Mr. Griswald, not so much with a view to changing their position, but to improve in the one they occupied. The classes lasted from 7.30 till 9 o'clock, the full course being divided into two terms of ten weeks each. The men were charged a fee of \$2.50, which was returned in full if they attended 80% of the classes and made fair progress. Out of a total of 47 students in 1911, only two forfeited their fees. An increase in wages was practically assured to those who made progress, 15 of the students in 1910 having been advanced in both wages and position until they had ceased to be helpers and were themselves in charge of men before the summer months were out.

In addition to structural drawing, Mr. Griswald thought that physics and geometry would be of most use to the men, and he was hoping to extend the classes to include these. There was a great deal of heavy hoisting in connection with the work of the Company, and although men of long experience rarely made a mistake in judging the size of chain to use on a certain piece of material, yet they seemed unable to impart this knowledge to the younger men. He realised that accidents would occur with less frequency if the men had some knowledge of the fundamentals of physics.

CHAPTER XXXVIII: SUMMARY OF OTHER TESTIMONY AS TO INDUSTRIES.

Much of the testimony submitted to the Commission, although voluminous in quantity, may be summarized by omitting repetitions, reiteration and elaboration. Under a few chief headings, therefore, a mass of evidence is grouped in the form of a narrative, the exact expressions of witnesses being reproduced as far as possible.

The groups are headed as follows:—(1) Industries and Workers (including Foremen); (2) Apprentices; (3) Kinds of schools called for. Some of these topics are treated elsewhere also, especially that of Apprentices.

SECTION 1: INDUSTRIES AND WORKERS (INCLUDING FOREMEN).

It may be said that manufacturers generally heartily support Technical Education in any and every form, many of them expressing willingness to have apprentices trained in shop time. There is a loud and general demand for workers of greater intelligence and ability to understand orders as well as special skill in the operations of the particular industry. A better class of operatives would increase production. Besides "trained intelligence and quickness of mind make better workmen, and they make more progress and get better wages."

Ability to read blue prints would very much improve many industries, but this is often lacking even in machinists, though they would increase their competency and wages by learning this. Drawing and mechanics would be valuable knowledge for men who take care of machinery.

The testimony is general that skilled and reliable men are difficult to get, and in some lines this difficulty is increasing.

In several industries workmen have to be imported from other countries; this applies more particularly to artistic crafts like lithography, and those involving knowledge of chemistry, such as paper-making. Even in these lines, however, a change is coming, for our technical and art schools are beginning to supply these needs; already the large pulp and paper company at Shawinigan Falls is "training natives on the spot."

Workers should know the reason for things they do; lack of this causes friction between workers and foremen. Canadian operators are being replaced, but if these were well trained they would be good foremen and even manufacturers.

It was urged that women should be put on Boards dealing with technical education, so as to watch the interests of women in industry.

The call for greater skill in industrial work may be summed up in the expression of one witness. "To-day industry needs a host of educated workers familiar with laboratory methods."

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In *Textiles, Clothing*, etc., technical instruction would improve the workmen's ability and cause a rise in wages. Operatives in clothing need elementary instruction to inculcate taste, and many would go further and develop this. In spinning, education is the only thing that can develop a girl's ability. Knowledge of how to keep the machine clean would not only afford discipline, but the girl could do more work than others. A cutting school where drafting or pattern-making was taught would be good. Superior training in the different processes of silk, cotton, woollen, linen and jute industries—in fabrication, dyeing, chemicals, etc.—would enable young women to fill positions now taken by outsiders. In the cotton industry, evening instruction in chemistry, mathematics, design and drawing would be a great help. In the manufacture of corsets a school of design would help very much. It was stated that there would be advantage to men in this industry to have places like the Lowell Textile School, Leeds College, Boston Technical School etc., which teach industrially.

In *Leather, Boots and Shoes*, etc., lectures on different kinds of leather would be good for apprentices; also practical illustrations of fitting and shaping the shoe upper to fit the sole, showing by the actual skin the good and bad parts, and how the leather goes into the shoe.

Lessons in pattern-making and design, drawing and artistic taste would be a great help. Manual Training in schools would make boys more skilled workmen.

To produce the right leathers, tanners must know chemistry and coloring, as chemical tanning is in vogue now. Tanners would be helped by more ability to read, write, figure and think—especially the latter.

Technical education would improve a worker's ability and increase his earnings. A practical knowledge of leather is needed to avoid mistakes. Cutters have to be skilled to use leather to advantage. The more training a foreman acquires, the better for himself and the concern. In the manufacture of boots and shoes there are a hundred operations, in every one of which the operator has to use brains combined with the machine; hence the better trained he is, the more and better work he will do.

In *Glove-Making*, leather for some lines must be imported from the United States, England or Germany, as Canadian tanners do not supply it. In explanation it was stated that Canadian business is not large enough to afford a market for those special lines. The only form of Technical Education said to be useful to glove makers was on glove cutting, in which department 40% of the men would be benefited by Technical Education. There was much loss on stock by men having only a general knowledge of construction.

In *Rubber Works* employees need Technical Education outside the factory. Apprentices need instruction. One employer said he would reduce apprentices' time in the factory to 5 hours if the other 5 were spent in school. The factory has to get foremen from the United States. One Rubber Company has three college trained chemists for analytic work.

In the *Building trades* there was said to be room for improvement. One witness suggested that men should be graded into classes and paid according to the certificate of the foreman; also that the Technical School should teach the principles underlying all trades.

In *Furniture, Cabinet Making, Carpentering*, a night school to teach drawing would be useful for those who make patterns for bedsteads, etc. A knowledge of cabinet making given in schools would make men better workmen, and save manufacturers' material. Carpenters need technical education for stairs and roofs, and should learn to read plans. In the manufacture of doors, sashes, furniture, etc., men who understood drawings would be worth fifty per cent. more, because they would not waste as much material, and also would be able to work without supervision by reading the plan.

Wood work in the finishing of buildings is now of better quality than 25 years ago, and calls for better trained men and better machinery. Drawing and mathematics would do a lot of good; instruction in the use of the band saw would also help.

In *Terra cotta* works men are mostly skilled, but need chemistry.

Bricklayers need training in straight wall work and art panelling work.

Tile Makers should know chemistry, as they have to burn the material.

In *Organ Building* a knowledge of sound, contraction of materials, effect of climate on organs, etc., would be valuable to the workmen.

In *Pulp and Paper Making*, technical education is favored because men could then be got in Canada who would know how to make paper scientifically and practically, and more men would be capable of taking higher positions. Before entering the factory they should have a knowledge of mechanics and general application of tools, also if possible some Manual Training. This would help the manufacturers very much.

For *Foundries and Machine Shops* men need instruction in geometrical drawing, mathematics, mechanical science, and knowledge of metals. If men could read plans, even though they could not make them, and those plans could be distributed to the workmen, the cost of production would be reduced.

In *Steel Work* all leaders must nowadays be college trained men. They need shop and college education together. Hence many of the McGill engineering students go to the Angus railway shops in summer for practical work.

In *Bridge Work* accidents would be avoided if men understood the fundamental principles of physics. Men with some knowledge of physics would be safer to entrust with the maintenance of bridges. Technical education would improve men in the Bridge Co.; older men are not quick enough. The number of machinists would be considerably increased if they had technical education directly bearing on mechanical work.

In *Railway Work*, mechanics must have technical education along with experience; practice combined with theory; head and hands working together. Locomotive engineers are taught by travelling instructors, road foremen and district mechanics. Men are trained for airbrakes by means of travelling equipment.

In *Aluminum* manufacture, in drawing wire and making cable, men should understand the fundamental principles of mechanics.

Barbers should know the dangers of disease; also should be able to detect skin diseases from appearances, so as not to pass on diseases by their tools.

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SECTION 2: APPRENTICES.

The "boy problem", always interesting, especially to parents, becomes pathetic—sometimes even tragic—in view of the lamentable but patent fact that Canadian schools are not holding and training boys during the critical years—14 to 17—and in too many cases not even as long as to 12. The boy's independence causes him to leave school, or his parents (perhaps with a large family) encourage him to turn out and work. He is thus deprived of schooling by pressure on his time for labor to help support the household. Under good conditions the average boy of 14 ought to be sufficiently educated to begin work, but few of them are.

When the boy goes to work the problem changes, and the worry is transferred from teacher and parent to employer. How to train the boy for work, and how to hold him when trained, are questions with which employers in Quebec, as elsewhere, are continually wrestling. The conditions are practically the same in all the Provinces, varied only or chiefly by the character of the elementary education, the opportunities for further education in evening schools and special classes, lack of desire for study, fondness for amusement, the temptations to shift from one factory to another, or to leave regular factory work altogether for outside employment which, though only temporary, pays better for a time.

In the case of girls the problem is perhaps less acute, but it has an added element of pathos in view of the fact that the future mothers of Canada are being deprived of domestic training and mental enrichment through deadening factory processes.

Testimony touching the points noted above is monotonous in its uniformity and repetition. The brief space at disposal may be usefully employed by citing suggestions for improvement.

Employers all prefer boys trained to habits by discipline. [If they were taught the importance of details, they would work more conscientiously, and fewer foremen would be needed. Manual Training and drawing in elementary schools would greatly help boys by accustoming them to use tools, enabling them much sooner to learn a line of goods, and to do handwork in different shops. Without such preliminary training, boys now have to work two or three years to acquire the proper skill to make a good job of a mitre or joint.

The Canadian Pacific Railway shops teach boys the proper way to handle tools, to set up machines, to repair them, and to handle work when it is in the machine.

An employer of fine machinists said apprentices should be taught mechanics generally, drafting and geometrical drawing, the latter being the most serviceable of all. A manufacturer of sashes, doors, etc., went further and said that a boy with a little knowledge of geometrical drawing would be a very good workman in six months, instead of requiring two or three years, as now; hence his schooling would enable him to earn more money and to do better work. This employer always gave the preference to boys who had Manual Training. If apprentices to bricklaying were well trained, one witness declared, it would improve the conditions of bricklayers and also of the bosses, as well as that of the apprentices themselves.

Boys need and should have systematic training while working in factories. There should be day and night schools for them. One factory had an instructor from the United States at \$15 a day to teach machinists. With three months' teaching boys were worth 10% more. One witness thought that 4 hours a week out of the Company's time is not too much to extend to the boys in their railway shops. It would be better to allow an hour a day, or 5 hours weekly.

A manufacturer of foot-wear declared that it would pay him to reduce the work of apprentices to 5 hours daily if they attended school the other 5, because, as he phrased it, "our success depends on getting good workers."

The part-time system was well thought of, though some witnesses considered that by involving double the number of apprentices it would be difficult to work. It has not been tried to any considerable extent in Quebec.

SECTION 3: KINDS OF SCHOOLS CALLED FOR.

In all the towns and cities visited the Commission found a desire for Evening Classes where they did not exist, and for more technical training where a start had been made in any form, correspondence courses not being considered satisfactory. Teachers are available at once in many places. Some towns have professors and also able architects who could carry on Technical Education. Free rooms are offered in some cases.

It is interesting to note that over 50 years ago Seigneur Joliette left funds for an Industrial School in the town called by his name.

It is recognized on all sides that a certain amount of elementary education must be obtained so as to prepare pupils to grasp Technical Education. It would be a help to Technical Education in after years to have free, compulsory education. A fear was expressed that a Technical School would not succeed because the standard of common education was not high enough to build on. This statement was challenged and stoutly denied. Technical Education would mean higher branches of arithmetic, mathematics, algebra, elementary chemistry and mechanical drawing. Drawing considered as a higher kind of penmanship would form a good foundation for Technical Education. One witness said: "Our workers most need reading, writing, arithmetic, geometrical drawing, a little mechanical science, chemistry and physics."

There must be correlation between primary and technical education, as the primary schools will have to supply the technical school with scholars. Teaching of drawing should be compulsory as a means of training children to observe closely. "Before going to a technical school solid elementary knowledge must be acquired to prepare for it. Better schools are needed".

Evening Schools were favored, though it is sometimes found difficult to secure attendance. Boys would be better for Night Schools, while older workmen would not object. Some Public School buildings are being used for Night Schools under the authority of the Provincial Secretary. Night Schools are said to be much better than Correspondence Schools. They are chiefly needed as Schools of Design, as employers have to go abroad for designers.

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It was predicted that the working people of Quebec city would be enthusiastic over the new Technical School.

Comparatively few young men from 15-18 attend Night School. Those schools should be made attractive, for a boy who goes to a factory at 14 and works all day is very often too tired to attend, having spent all his strength during the day. What a boy goes through as apprentice militates against the Night School. Pupils in an Evening Technical School who work during the day demand theory more than practice in their classes.

The work done in the evening classes under the Council of Arts and Manufactures is everywhere well spoken of. Many students who have gone through those classes have done well. Young men learn to read plans. Cases are known of men making \$1.50 a day who had, by diligent study in those classes, worked up into positions worth \$1,800 a year. Freehand drawing for a year is insisted on, and does great good. Many firms apply to the Montreal classes for designers. One lady pupil gets \$18 a week as draftsman in a factory. The newspaper illustrators were drawn from these classes. The freehand drawing taught at the Monument National compares favorably with anything in the United States.

The ideal plan was a school in which a boy finishes with a good education; then public schools devoted to technical knowledge, in whatever branch the boy has undertaken; next shop work as an apprentice. Such a boy would be splendidly equipped. It would be good thing to have a Technical School for apprentices, provided the matter of their wages could be arranged.

The example of France was referred to, where Manual Training is established in connection with primary education. Manual Training helps those who want a technical course; it would induce a boy to find his own disposition; it trains the hands to obey quickly the impulse of the will. Some boys, while dull at book work, are clever with their hands. Boys from 12 to 15 want to do things; they are constructive. Manual Training sets the boy thinking, and the physical exercise in making things in Manual Training is good for his health. Opinion as to ability cannot be based on what a boy does at College.

Instead of teaching a girl the same drawing as a boy who is going to be a workman, she ought to learn to draw in connection with clothing, cutting, etc.

It is believed that Technical Education has made modern France, Germany, and Great Britain what they are, and some witnesses sadly stated that skilled foreigners hold the best positions in industrial establishments in Canada today.

It was asserted that with more practical education the moral standing of the population could be raised, and better citizenship acquired. There are many openings for those who have technical or commercial education, while the professions are overcrowded.

The need for Technical Education of a higher sort, such as the Polytechnic School and University give, was emphasized. The cost of technical education in one establishment should be shared by other manufacturing concerns.

In Montreal there is a forward movement for Industrial Education. The new Technical School there uses both the French and English languages. The dual system works harmoniously, and both classes wish to help Technical Education. An advocate of the Technical School for 20 years thinks that instead of

one Technical School in Montreal, they should be established in all industrial centres of the Province to suit the industries of each place.

"The two Technical Schools in Montreal are the best things done here," said one witness.

One witness said he could get 50 or 60 children in Valleyfield for a Trade School.

Various other suggestions were made, such as these:—Instructors travelling among various branches of industry would accomplish something. There should be exhibits of industrial art work, also pictures in schools. Co-operation with business men for an exhibition of Canadian Art would lead to interest in Art. The Dominion Government should train its own workers. A Technical School is a question of competent instructors, and the Dominion Government should help it. If a certain sum of national money were given towards Industrial Training for efficiency, a certain part of it could be used for the education and training of teachers as a means of industrial efficiency for the nation, which is a concern of the Dominion Government.

CHAPTER XXXIX: OKA AGRICULTURAL COLLEGE.

This establishment was affiliated with Laval University in March 1908. It had existed prior to that date, under the name of the School of Agriculture, having been opened in 1893 by the Trappist Fathers of Notre-Dame-du-Lac, at the request, and with the liberal assistance, of the Provincial Government.

Since that date, the work has continued to make progress in training men for the administrative services for rural and agricultural industries. The College was reorganized in 1907, at the request of the Provincial Minister of Agriculture, the religious authorities, and the agricultural missionaries, with the full approval of the Council of Public Instruction. It was decided that the School should retain all that experience had proved to be effective and desirable, whilst adding new improvements and equipment suitable for modern requirements and a more extended course of instruction. These additions were completed in the spring of 1910.

The Course at this College covers 3 years. A preparatory course is provided for pupils whose previous education and knowledge are found to be inadequate. There is also a special course for older pupils who are unable to take the full course. This comprises various short courses, of a practical character and of varying length, according to the subjects taken up.

The College has 1,800 acres of ground, 700 being under cultivation. It offers to its students wide facilities for the practical study of agricultural conditions. Nearly all the varieties of soil found in the Province of Quebec are represented, and cultivated with extremely profitable results, thanks to the economical and intelligent methods of the cultivators. All kinds of vegetables which can be successfully grown in the Province are cultivated to great advantage. Many kinds of cattle are kept on the farm. The strictly agricultural industries are carried on in great variety, together with other rural industries, such as blacksmith's work, harness-making, carpentry, baking, soap-manufacture, etc.

Practical work is given the foremost place in the instruction. Under the direction of the instructors, students learn to do the work themselves in connection with the preparation of the soil, feeding of cattle, fruit-culture, draining, management of machines, gardening, etc. By this means they are able to master the numerous details of supervision, handling and execution connected with farm work, as well as learning to observe, judge and decide for themselves. The farm and lands attached form the professor's principal laboratory.

Whilst giving young men intending to take up agriculture all the vocational instruction required in their business, attention is paid to scientific methods applicable to the cultivation of the soil. The aim is to turn out men who, in addition to the technical details of their business, are sufficiently familiar with science to be able to judge for themselves, in given conditions, of the value of various methods of agriculture or rural economy.

THE LIBRARY.

The Library of the College contains a collection of Canadian works on agriculture and rural industries, as well as many foreign works on agricultural and scientific matters, biography, travels and popular technical books.

LABORATORIES.

These are equipped with modern appliances for chemical, physical and other experiments, natural history specimens, examples of vegetable and animal biology, zoology, zootechny, entomology, mineralogy, botany and geology related to agriculture. Apparatus for making experiments with soil and grain, meteorological instruments and appliances for rural engineering, a herbarium containing Canadian plants, and a collection of insects, etc., complete the equipment. Mural charts, diagrams, lantern views, and modern appliances are placed at the disposal of the teachers and students.

ENTRANCE REQUIREMENTS.

Students applying for Scholarships must be British subjects and domiciled in the Province of Quebec. All students must be at least 15 years of age, produce a certificate of good conduct from their priest or last schoolmaster; be strong enough to work about 5 hours a day round the farm or grounds; intend to take up agriculture or a rural industry; undertake to observe the rules of the establishment, and pay all necessary fees. All students, except those exempted according to the regulations, must pass an entrance examination, which covers the program of the Elementary Schools of the Province of Quebec. Students unable to take this examination, but who show promise of success, may be admitted to the preparatory course. Exempt from entrance examination are:—Graduates of Classical colleges affiliated with Laval University, having the bachelor's diploma or equivalent certificate; students of normal schools with the primary certificate, and those who have received diplomas from the Central Board of Catholic Examiners of the Province of Quebec.

The entrance examination is written only, and must not exceed the limits of the program of elementary schools. It comprises the following subjects:—French language, arithmetic, accounting, geography, Canadian history, natural sciences, elementary agriculture, and drawing.

The year is divided into 2 terms, commencing in the first week of September, and concluding in the middle of July, with one month's vacation at Christmas. No other holidays are given, except Sundays and church festivals.

In the preparatory year, the time is divided as follows:—French language, 50 hours; English language, 30 hours; arithmetic, 50; accounting, 30; geography, 30; Canadian history, 20; natural sciences, 30; agriculture, 50; drawing, 20; astronomy, 6. In the second term, drawing receives only 14 hours, and astronomy is omitted. The total number of hours are, in the first term, 316, in the second term, 304.

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In the Regular Course, the time is divided as follows:—

<i>1st term.</i>		<i>1st Year.</i>		<i>2nd term.</i>	
	HOURS		HOURS		HOURS
Large Cultures.....	20	Large Cultures.....	40	Large Cultures.....	40
Fruit Culture.....	70	Fruit Culture.....	30	Fruit Culture.....	30
Live Stock, Hygiene and Veterinary Science.....	105	Live Stock, Hygiene and Veterinary Science.....	60	Live Stock, Hygiene and Veterinary Science.....	60
Rural Engineering.....	20	Apiculture.....	50	Apiculture.....	50
Botany and Biology.....	30	Rural Engineering.....	20	Rural Engineering.....	20
Chemistry.....	25	Agricultural Bookkeeping.....	20	Agricultural Bookkeeping.....	20
Physics.....	25	Botany and Biology.....	20	Botany and Biology.....	20
Meteorology.....	10	Chemistry (organic).....	20	Chemistry (organic).....	20
Physics.....	25	Physics.....	30	Physics.....	30
Language and Composition.....	11	Meteorology.....	5	Meteorology.....	5
		Language and Composition.....	9	Language and Composition.....	9
Total.....	316	Total.....	304	Total.....	304

<i>1st term.</i>		<i>2nd Year.</i>		<i>2nd term.</i>	
	HOURS		HOURS		HOURS
Large Cultures.....	20	Large Cultures.....	40	Large Cultures.....	40
Horticulture and Floriculture.....	40	Horticulture and Floriculture.....	15	Horticulture and Floriculture.....	15
Fruit Culture.....	30	Fruit Culture.....	30	Fruit Culture.....	30
Live Stock.....	90	Live Stock.....	75	Live Stock.....	75
Apiculture.....	25	Aviculture.....	35	Aviculture.....	35
Rural Engineering.....	20	Rural Engineering.....	50	Rural Engineering.....	50
Political Economy.....	20	Rural Economy.....	20	Rural Economy.....	20
Entomology.....	10	Bacteriology.....	10	Bacteriology.....	10
Organic, Analytic and Agricultural Chemistry.....	30	Agricultural Geology and Geography.....	20	Agricultural Geology and Geography.....	20
Mineralogy.....	20	Language and Composition.....	9	Language and Composition.....	9
Language and Composition.....	11				
Total.....	316	Total.....	304	Total.....	304

<i>1st term.</i>		<i>3rd Year.</i>		<i>2nd term.</i>	
	HOURS		HOURS		HOURS
Large Cultures.....	40	Large Cultures.....	60	Large Cultures.....	60
Forestry Culture.....	20	Live Stock.....	100	Live Stock.....	100
Live Stock.....	110	Rural Engineering.....	35	Rural Engineering.....	35
Rural Engineering.....	45	Rural Legislation.....	30	Rural Legislation.....	30
Rural Legislation—civil law, administrative and municipal law.....	40	Science applied to agricultural industries: food, drink, vegetables; animal products; chemical products.....	60	Science applied to agricultural industries: food, drink, vegetables; animal products; chemical products.....	60
Geology and Geography.....	30	Agricultural Geology and Geography.....	10	Agricultural Geology and Geography.....	10
Bacteriology.....	20	Language and Composition.....	9	Language and Composition.....	9
Language and Composition.....	11				
Total.....	316	Total.....	304	Total.....	304

MANUAL WORK.

In summer, students work 6 hours a day out of doors, in winter, 4 hours. In addition to lessons in classrooms, meetings of agricultural societies held at the Institute several times a year, and experiments in laboratories, students receive a thorough and graduated training through daily work and observations made in

the different departments. Students have to perform in rotation every kind of service in connection with the farm, orchards, live stock, dairy, sugar-making, cider-making, wine-making, etc. They thus learn every detail of agricultural and allied industries, and acquire manual dexterity, intelligence and endurance. Great stress is laid on practical work in awarding diplomas.

Students have the opportunity of studying every phase of rural industries, selecting the branch they wish to take up, among those practised at the College. They can study electric heating, lighting, etc., in the plant at the institution itself and thus acquire a working knowledge of power and heating apparatus. Those who desire it may take up forestry, and study the various kinds of woods.

SHORT COURSES.

The short courses are a special feature, especially intended for adults who are unable to take the regular course. Each is distinct and complete in itself. They are entirely practical, and vary from 2 to 6 weeks, being held at all seasons. No examination is required for admission, but students have to give references, undertake to follow the whole course, and pay all fees in advance.

The following are some of the subjects dealt with:—

Breeding and feeding of stock (2 weeks).

Preparation of the soil for seed and selection of seed-grain; rotation (2 weeks).

Fruit culture (3 weeks).

Aviculture—birds, poultry and their products (6 weeks).

Horticulture (3 weeks).

Apiculture (4 weeks).

A special certificate is awarded to those who are successful in these short courses.

Younger pupils may be admitted to short courses by special arrangement only.

EXAMINATIONS.

Periodical examinations are held during the course, and a written examination once a month and at the end of term. These are conducted by the authorities of the University, who also award degrees. Oral, written and practical tests are set, the latter being conducted by the heads of the departments concerned. Pupils failing to pass the practical test, even if successful in the theoretical part, are considered as having failed. The same rule applies to students failing in the theory, but passing the practical test.

Students who have received the diploma of Bachelor, may one, two or three years later take the examination for the degree of Doctor of Agricultural Science.

FEES.

Scholarship pupils pay: Registration Fee \$1; Laboratories and Library, \$5, Deposit for breakages, etc., \$10; Laundry, \$10; Bed-linen, if furnished, \$5.

Ordinary pupils pay \$100 a year for board, lodging and instruction, other fees as above; total \$131 per annum.

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Fees for examinations and diplomas amount to \$19 in all.

Students pay their own medical and infirmary expenses.

The authorities announce that it is very desirable that students should come to the College with as complete preparation as possible. They would then be enabled to take up at once the physics, chemistry and natural science applicable to agricultural and rural industries. Every effort is made to simplify this part of the instruction by object-lessons, laboratory work, demonstrations, and exchange of ideas between teachers and students.

The authorities do not overlook the fact that nowadays it is not only agricultural instruction that is required. Commercial, economic and social questions more than ever before enter into the life of the agriculturist, and he has to consider not only the climate and the soil, but markets and transportation. He has not only to select produce which is suited to the soil, but that which sells the best. He has to find new outlets, understand transportation questions and the preservation and storage of foodstuffs. Further, in order to protect his own interests, it is incumbent upon him to understand how individual, isolated forces may become powerful through association, co-operation, clubs, syndicates of all kinds.

The Announcement affirms that such is the work undertaken by the Oka Agricultural College. "Not a student of our best schools, or even of our colleges, but would obtain here, for his own happiness and for the general prosperity of the nation, a suitable and earnest preparation for what is perhaps the most desirable of all careers. The future of the race lies in agriculture. 'Let us be a nation of agriculturists', said Arthur Buis, at the close of one of his most remarkable pamphlets on agricultural propaganda, 'and we shall soon become a nation. The earth contains the supreme resources and power; it is through it that everything is renewed and fructified. Agricultural tastes and agricultural education produce a virile nation'."

SECTION 2: THE WORK OF THE AGRICULTURAL MISSIONARIES.

Information obtained from MR. J. C. CHAPAIS, Assistant Commissioner for Dairying for Canada.

An Association which merits special mention is that of "The Agricultural Missionaries," organized by the Catholic Bishops of the Ecclesiastical Province of Quebec in the year 1894. It is composed of one or more parish priests, selected in each of the Quebec dioceses by the local bishop to take in hand the interests of agriculture amongst the farmers. They strive to show that idleness, want of method, the habit of drinking strong liquors, and luxury, are among the worst foes of agriculture, and their authorized voice is listened to and is a means of producing wonderful results.

The 6th Report of its operations gives very interesting information regarding the work done by these valiant apostles who preach Agriculture at the same time as the Gospel. No subject in connection with the practice of agriculture is unfam-

iliar to these zealous priests whom the Reverend Bishops of the ecclesiastical Province of Quebec have specially delegated to look after the material and moral interests of the agricultural classes in this province. A study of this Report reveals that the branches studied by these industrious Missionaries in their conventions, and dealt with by them during the last 3 years before meetings of agriculturists at which they were present, comprised the following:—manuring, melon culture, the care of bees, the best fruits to grow on the farm, the Experimental Union of Quebec, the Schools of Agriculture and the Experimental Farms of the Province of Quebec, the breeding of horses, co-operation in agriculture, dairying in all its branches, aviculture, apiculture, horticulture, domestic schools, school gardens—to mention only a few among many others. 770 circles have been visited by the Missionaries or their deputies; and 145, 250 agriculturists were able to benefit by their instruction, the latter being of a very varied character, covering 236 subjects dealt with at lectures.

The same Report shows that the following lecturers, all expert in their respective branches of agricultural industry, were asked to give the Agricultural Missionaries the benefit of their advice at the annual conventions, or to represent them in visiting the agricultural circles:—Messrs. G. A. Gigault, the Rev. Trappist Father Athanase, Brother Liguori, Dr. W. Grignon, O. E. Dalaire, Dr. Dauth, G. Reynaud, J. C. Chapais, G. Dimitriou, J. B. Blanchard, J. D. Leclair, J. N. Lemieux, L. M. Grignon, and others.

The question has often been asked whether French-Canadians know how to appreciate at its full value the devoted work of the Agricultural Missionaries. It is known that the effectual assistance given to agriculture by the Catholic priests in the Dominion of Canada from time immemorial, dating from the days of New France to the present time, is recognized and commended by fellow-citizens of a race and creed different to theirs. Fresh evidence of this appears in the issue of the "Farm and Dairy," published at Peterborough, Ont., which shows how much of the work the agricultural priests is appreciated. The article is entitled "Priests as Agricultural Experts," written by Mr. J. A. Macdonald.

In the eastern parts of Nova Scotia and in Cape Breton, as well as in Prince Edward Island, the Catholic priests take a great interest in agriculture, dairying and stock-raising.

In organizing the system of co-operative dairying in Prince Edward Island in the ten years following 1890, Professor J. W. Robertson would never have met with the marvellous success which he did, if he had not had the advantage of the enthusiastic co-operation of the Catholic priests. He himself frequently admitted this.

I observed, in the course of my travels in eastern Nova Scotia, that the Catholic priests in many cases filled the rôle of agricultural experts to the people. This is particularly the case in the County of Antigonish, and in almost all the counties of Cape Breton. Before I reached Pictou last week, two Catholic priests, the Rev. Fathers Tompkins and McPherson, of St. Francis Xavier College, gave lectures on agriculture in various parts of the county, on the rotation of crops, the cultivation of turnips, methods of cultivating the soil, etc., and were to speak in several other places.

These reverend abbés are experts in the solution of agricultural problems, and their lectures are very instructive. Instead of the small audiences of Farmers' Institutes in Ontario, organized by the Provincial Government, these priests gather together 150 or more farmers. This large attendance at the beginning of the harvest season is a splendid evidence of the confidence entertained in the good fathers by the farmers of eastern Nova Scotia.

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It may be mentioned that in the Provinces referred to above, no organization of Agricultural Missionaries exists, this being peculiar to the Province of Quebec. In view of the fact that efforts due to the individual devotion of a few priests to the temporal welfare of their parishioners are so highly commended by those not sharing the Roman Catholic faith, how much more should the patriotic work inaugurated by our Reverend Bishops in the organization of a band of agricultural Missionaries to ensure the material advancement of the agricultural population, be appreciated? As his late Eminence Cardinal Taschereau said in 1879, in a circular addressed to his clergy, "the welfare of their souls is dependent in a large degree on this material progress."

CHAPTER XL: MACDONALD COLLEGE.

SECTION 1: GENERAL STATEMENT.

Macdonald College, which is incorporated with McGill University, was founded, erected, equipped and endowed by Sir William C. Macdonald for the following among other purposes:

(1) The advancement of education, the carrying on of research work and investigation, and the dissemination of knowledge; all with particular regard to the interests and needs of the rural population;

(2) To provide suitable and effective training for teachers, especially for those whose work will directly affect the education in schools in rural districts.

The College recognizing the importance of education, adequate and suitable for the needs of the rural communities which are the great producing class of the country, works in sympathy with all other educational effort for the development and increase of intelligence, power, ability and skill, and willingness to co-operate for the common good in each locality and in the nation at large. The work is arranged into:—

A School of Agriculture;

A School for Teachers;

A School of Household Science.

Increase of productiveness, improvement of products of the field and the industries of the farm and the town, greater comfort and enjoyment in the home, a better taught school for the children, and a nobler sense of the duties and responsibilities of life,—these are among the advantages which the College assists in providing for Canada.

The College property, situated at Ste. Anne de Bellevue, Que., twenty miles from Montreal, comprises 561 acres, divided into (1) The Campus, (2) Experimental grounds with illustration plots; (3) the Small Cultures Farm for Horticulture and Poultry, and (4) the Live Stock and Grain Farm.

Macdonald College is a College of McGill University, the Principal and some members of the Staff being members of the Macdonald College Committee, which directs the educational policy and internal government of the College, subject to the Governors of McGill. All courses at Macdonald College leading to a degree of McGill are subject to the control and approval of the Governors, while the courses for training teachers for the Protestant schools of Quebec are under the direction of the Teachers' Training Committee and the Protestant Committee of the Council of Public Instruction.

ENTRANCE REQUIREMENTS.

School of Agriculture (Faculty of Agriculture of McGill).—Candidates must be 18 years of age, of satisfactory moral character and health, must have been

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vaccinated, and must have worked for a season on a farm. In addition, candidates for the one and two year courses must be conversant with the English language and elementary mathematics, history and geography.

The course extends over 4 sessions of about 7 months each, and leads to the Degree of Bachelor of Science in Agriculture.

School for Teachers.—Teachers to be trained for the schools under the Protestant Committee of the Council of Public Instruction for Quebec Province are admitted under the conditions prescribed by that body; others under the Macdonald College regulations. Such candidates must be 18 years of age, in good health and of good moral character, and recommended by the Department of Education or School Inspector of the Province where they reside.

School of Household Science.—Candidates (a) for Home-makers' and Short Course must be aged 18, and (b) for Housekeepers' Course, aged 23, with evidence of good health (including vaccination), satisfactory moral character, and ability to read and write English, with proficiency in elementary mathematics.

In case of accommodation not sufficing for all candidates, preference will be given to those from the rural districts of Quebec, the Maritime Provinces and Eastern Ontario.

LIVING EXPENSES.

For board and lodging, double room, \$4 per week; plus laundry fee \$1 per session, (for use of laundry); doctor's fee, \$3 per session. All students must deposit \$5 caution money on entrance.

TUITION FEES.

School of Agriculture.—Students from the farming community of Quebec Province are admitted free for the first two years; for the third and fourth years at \$50 per year. Other Canadians, all years, \$50 per year. Students from outside Canada, all years, \$100 per year.

Laboratory Fees, 1st and 2nd years, \$5 per year;
3rd and 4th years, \$15 per year.

Registration Fee for Short Courses, \$1 per course.

School for Teachers.—

Residents of Quebec Province, free;
Other residents of Canada, \$75 per year;
Students from outside Canada, \$100 per year;
Laboratory Fee, \$5 per year.

School of Household Science.—

Students from the farming community of Quebec Province, free;
Other residents of Canada, and students from outside Canada, \$25 per year.
Laboratory Fees for Homemaker and Housekeeper Courses, \$10 per year.
For Short Courses, \$5 per year.
Partial and special students (Schools of Agricultural Science) \$5 per subject per term of course, and laboratory fee covering cost of material.

BUILDINGS AND EQUIPMENT.

The buildings are constructed with all modern improvements, a complete system of ventilation being furnished to every room.

The Main Building forms the centre of the group, around it being the residences and laboratories. It contains a Reading Room and Library, Assembly Hall with pipe organ, and accommodation for the School for Teachers, the laboratories and rooms for Nature Study and Manual Training, and the School of Household Science.

The class rooms and laboratories of the latter occupy the end portions of the second and third floors. There are two large kitchens, each with working places for 28 students, for practice work in cookery; a dining room where experience is obtained in serving simple meals and special menus, and in the decoration of the table; a large sewing room for practice in hand and machine sewing; dressmaking and millinery rooms; a laundry for practical work in best methods of washing, cleaning, and ironing; and a house decoration room for the study of the principles and methods of the furnishing and decoration of the home.

The Biology-Bacteriology Building contains the laboratories and equipment for these departments, the dairy and soil laboratories, and four private research laboratories.

The Chemistry-Physics Building is well lighted and ventilated, with all necessary apparatus, and special arrangements for flues to carry off noxious fumes. There is a special laboratory for elementary work in Mechanics in the School of Agriculture, with simple farm appliances; as well as a large workshop with full equipment.

The Agriculture-Horticulture Building is devoted to Home Dairying, Horticulture, Agriculture, Live Stock, Cereal Husbandry and Farm Machinery.

The Poultry Building is thoroughly equipped for instruction in the management of poultry, with sections containing pens of the various breeds, illustrations of the intensive and extensive systems, and an excellent brooder house.

DAY SCHOOL AND STUDENTS' RESIDENCES.

The Day School for the Protestant children of the district, which is a practice and observation school for the School for Teachers, contains a Kindergarten room, four other class-rooms, and a large assembly hall, all suitably equipped. It has a School Garden, containing plots for the children and for the student-teachers, together with illustration plots used in Nature Study and for the instruction in the selection of seed, rotation of crops, the protection of crops from diseases, etc.

The Women's Residence has accommodation for over 200 women, with reception and music rooms, apartments for the Superintendent and Housekeeper, a hospital, rooms for women teachers; large dining room, swimming pool and gymnasium, etc.

The Men's Residence is on the same plan, and contains accommodation for over 175 men, with reception rooms, gymnasium, etc.

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FARMS, GROUNDS, ETC.

The Main Farm consists of a farm house, several cottages, barns, stables, etc. The dairy herd supplies milk for the College, and calves are sold to Agricultural Societies.

The Cereal Husbandry Department works for the improvement by selection and breeding of all classes of field crops. Five rotation farms have been laid out for the study of rotation and good seed, and four acres are devoted to illustration work with cereals, where experiments are carried on.

The Horticultural Department, with its laboratories and greenhouses, gives students the opportunity of studying practical horticulture during the winter. The Horticultural Farm covers about 70 acres, 30 acres of which are orchard; 20 are devoted to apples, on which cultural experiments have been made since 1909, with a variety orchard.

SECTION 2: THE COLLEGE IN DIRECT RELATION TO AGRICULTURE.

DR. F. C. HARRISON, Principal, gave the Commission an interesting outline showing the relation of the Federal Government in the United States to the development of agricultural education, and pointed out something of the opportunity and obligation in Canada. The following³ are the points presented by Dr. Harrison:—

We see in the United States a body of workers of extreme accuracy and keenness, and a scientific superintendence not possessed, in his opinion, by any European country. This impetus to agricultural education came about the year 1862, when Senator Morrill, by what is known as the Morrill Act, got through Congress a grant to each State of 30,000 acres of land for each Senator and Representative in Congress to which each State was entitled under the Census of 1860.

The moneys derived from sale of these lands were to be invested at not less than five per cent., and this interest was to be appropriated by each State to the "endowment, support and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches as are related to agriculture and the mechanic arts, in such manner as the legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life". (Sec. 4)

Some of this land was sold, some still remains to them, but the average annual income which individual States receive from those grants of land amounts at present to some \$15,000 a year.

LIBERAL ADDITIONAL ENDOWMENT.

An additional endowment was granted under the second Morrill Act, (1890), which appropriated, out of any money in the Treasury not otherwise appropriated arising from the sales of public lands, "the sum of \$15,000 for the year ending

June 30th, 1890, and an annual increase thereafter for ten years by an additional sum of \$1,000 over the preceding year, and the annual amount to be paid thereafter to each State and Territory shall be \$25,000 to be applied only to instruction in agriculture, the mechanic arts", etc.

By the Nelson amendment (1907) Congress added to the above the sum of \$5,000 for the year ending June 30th, 1908, "and an annual increase of the amount of such appropriation thereafter for four years by an additional sum of \$5,000 over the preceding year, and the annual sum to be paid thereafter to each State and Territory shall be \$50,000, to be applied only for the purposes of the agricultural colleges as defined and limited" (in the Acts of 1862 and 1890).

Thus the State Agricultural Colleges have from the United States Federal Government an income of \$50,000 (from the second Morrill Act and the Nelson Amendment) as well as an income of \$15,000 from the first Morrill Act passed in 1862, while some of the land granted them is still unsold, and yields an average return of 6% or 8%. This is what the Federal Government did for the Governments of the individual States.

FURTHER FEDERAL GRANTS.

In addition to all the above, by what is known as the Hatch Act, 1887, the sum of \$15,000 annually was given to each State for the purpose of promoting scientific investigation and experimental stations where the various phases of agricultural research might be carried on in each State. That amount was increased by the Adams Act of 1906, so that by the provisions of those two Acts each State experiment station will shortly be receiving from the Federal Government the sum of \$45,000 per year.

Disbursements from the United States Treasury for the period from 1888 and 1907 for the experiment stations alone amounted to \$11,000,000.

This is what the United States Government has done for the State Governments. Now, what has been done in Canada during this period? We find there were certain experimental farms founded through Mr. (afterwards Sir) John Carling, that at Ottawa being the first, together with certain branch institutions which are not run by the various Provinces in which they are located, but which are run by the Federal Government from Ottawa.

Now, it is impossible for an ordinary director at Ottawa to look after experiments as far west as Agassiz, B. C., and as far east as Nappan, N. S. To look after the various phases and interests of agricultural life requires constant supervision. In each of those experimental farms there is not a complete scientific staff, as there is in the States, but usually just a few men who are interested along one or two phases, and who have not had the education that is now given to graduates from agricultural colleges; yet many of their experiments require a good deal more exact knowledge than we have at the present time.

PROVINCIAL GOVERNMENTS SHOULD CONTROL FARMS.

If those experimental farms were turned over to the respective Provincial Governments, and a sum given them every year, the people living in those Provinces would get greatly increased benefits from those stations.

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Macdonald College has a scientific staff which we think is unsurpassed in Canada. Our men are capable of and willing to do good work, such as requires a great deal of money as well as thought to map out. If we could get the Dominion Government to take the same part as the Federal Government in the United States, our work would very quickly spread over those Provinces, first by getting ourselves better known in Ontario and the West, and also by experiments which would be of direct benefit to the country.

It is true that we have here both French and English. In places in the United States where there are two institutions the money is divided by law; so in this Province it could be divided. We would attempt to serve the English interests in the Province, and we could both work together on many points of common interest.

OTTAWA STAFF A RESERVE CORPS.

The corps at the experiment station in Ottawa should be looked upon as the reserve, so that they could throw their scientific weight and knowledge and acumen into some problems that come up year after year—first helping the Province of Ontario, then the Western or Eastern Provinces on the particular problems in which they are engaged, and thus helping the various Provinces to do their work. Thus all could work harmoniously together in the interests of agricultural research and agricultural education.

Another way in which the United States Government helps the various State experiment stations is by allowing them the privilege of free mailing of bulletins, publications and newspapers to the farmers. Our Dominion Government only allows the franking of parliamentary papers from the Provincial Legislatures. If correspondents were allowed to write to the various Provincial institutions without affixing postage stamps a great deal of information could be given to them by that privilege.

COURSES IN SCHOOL OF AGRICULTURE.

(A) *Short Courses of Two Weeks Each.*—These are as practical as possible, and cover Live Stock, Cereal Husbandry, Horticulture and Poultry. They are designed to help practical men, who cannot attend the regular courses, to a better understanding of the methods in different branches of agriculture, and to enable them to carry on their operations and management with greater success and satisfaction. The courses consist of lectures, discussions, illustrations, demonstrations and laboratory practice.

(B) *Two-year Course leading to Diploma.*—This covers Animal Husbandry, Field and Cereal Husbandry, Horticulture, Poultry Husbandry and Home Dairying. It is eminently practical, being intended to meet the needs of farmers' sons who purpose returning to their farms. During the first year the practical subjects such as Animal and Cereal Husbandry, Horticulture and Poultry are emphasized, as it is believed that the valuable but rather indefinite information already possessed by the student can be used from the outset in building up a superstructure of agricultural knowledge, enlarged and strengthened by the in-

roduction of scientific principles gained in the laboratories. In the second year more attention is given to the sciences bearing on agriculture, and the facts on which the principles of agriculture are based, together with a continuation of practical subjects. Drawing, English, History, Manual Training, Mathematics, Physical Training are included with the agricultural subjects.

(C) *Four-year Course leading to Degree of Bachelor of Science in Agriculture. (B.S.A.).*—This is a continuation of the two-year course for more advanced knowledge of rural economy, the natural sciences and their application to the conditions, processes and organization of rural life. Four-year Students have to prepare a thesis at the end of the Third Year on some subject of original investigation in their department.

CEREAL HUSBANDRY.

Statement by MR. LEONARD S. KLINCK, Professor of Cereal Husbandry at Macdonald College.

In class work here we grow material for the advanced men. For the first two years we obtain material from the plots. The advanced men get special work because of special treatment. In growing material for the advanced work we create certain conditions and get certain results. In research work the content of life is varied by crossing or selection, or by varying the conditions of planting.

In cereal husbandry research work has had results of economic, profit-making value, especially in oats, new varieties having been discovered and old ones improved by the means mentioned in conjunction with soil management and the rotation of crops.

This work is valuable to students, both by what they see and hear, and by what teachers obtain in doing it, because laboratory work adds so much to the interest of lectures, having a direct bearing on the problems which confront the students. This has much greater practical value than merely speaking of the matter without presenting the materials. A student in this way gets much more out of it than a farmer merely reading or hearing of it.

VALUE OF RESEARCH WORK.

This research work is of great value to the country in the case of all cereals. The best results come from having students present in summer when the crops are growing; such men become "live wires" in this line of work, while those who visit the stations only once in a year or two, and do not spend sufficient time to get acquainted with the actual work done and learn the underlying principles, are not influenced to anything like the same extent as the man who understands his work.

Money spent on experiment work in an agricultural college would be of much greater advantage to a crop-growing Province than if expended where no students are trained; because when a man is brought into contact with students he cannot afford to be lax in his work, and in teaching his subject he gets so

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many ideas from wide-awake pupils, who are every year up against problems of vital importance, that if he has the money to do work, he will plan an entirely different line of experiments to meet the demands of the Province, through being in close touch with its conditions. He has also greater opportunities for disseminating the information obtained. He would thus be making research meet the pressing problems of the times.

Federal money where needed, associated with Provincial money, would make an agricultural college more effective as a research station, and if safeguarded, as in the United States, the money would be wisely expended. In the past there has been too much duplication, but this has now been overcome, with the advantage that the work of different stations is much more closely related, results are given greater publicity, and workers in different stations know more of results obtained outside.

IMPROVEMENT IN CORN CULTURE.

A good beginning has been made with classes to improve the corn crop of Western Ontario, where they are beginning to produce corn that was not produced before. This would revolutionize the fodder crop in Quebec in ten years if the campaign were kept up and worked from both ends; i.e., Ontario should produce a kind of corn that will enable Quebec farmers to grow better fodder, and in that way Technical Education up there would have an influence down here. The only reason for going to Western Ontario was that the farmers of Eastern Ontario and Quebec needed just such corn, and it was a question of bringing producer and consumer together. I have gone there to give special training to the farmers for growing seed for fodder crops for our farmers down here; the seed obtained there is better for forage crop.

There has been much gain to the country as a whole as a result of Technical Education from the use of pure seed as distinguished from mixed strains, and the tendency towards the latter in the wheat growing prairies has been corrected, so that the quantity of reasonably pure seed available is greater now than ever before. A farmer who grows a good quality of Red Fife can now get \$1.50 per bushel by the carload, whereas formerly he could hardly get a few cents above market price. That is how the public value that grain, which does not cost the farmer any more to grow, so there is no reason why that method should not be extended over greater areas.

ALFALFA FOR QUEBEC FARMS.

Alfalfa requires three years to come to full development, and in ordinary farming conditions a man could not depend upon its reaching the third year with as much certainty as other crops; but where conditions can be controlled it is just as certain. A man can learn to grow alfalfa with certainty under ordinary conditions here, and it would be very useful to the farmers of Quebec if it were generally grown. Illustration plots might be necessary to impress upon them the special requirements of the crop, and also to convince them of its success, the latter being the greatest difficulty. One of our plots last year brought 9 tons per acre of cured alfalfa, and none were under 8 tons. The same land in mixed hay

would yield 2½ tons. For young stock and milch cows alfalfa is far better than ordinary mixed hay; besides, the soil would be more productive after three years of alfalfa, whereas with mixed hay it would be impoverished. Alfalfa is richer in nitrogen, and there is no question that it would greatly increase the value of farms. If ten stations were established, costing \$1,000 each, they would be profitable in every way, as farmers would be properly directed.

HORTICULTURE.

Statement by MR. WILLIAM S. BLAIR, Professor of Horticulture at Macdonald College.

The Quebec climate is good for vegetables, and also for apples and small fruits. A vegetable grower is a skilled tradesman; he requires special training, and different from that for horticulture.

Technical education could increase the output of orchards in Quebec; the apple product could be doubled in value.

There are four demonstration orchards, financed by the local Government, this College being associated with that work through the Pomological Society; those station gardens provide information for students here. This work is done in old orchards which are in fruit, and is of value, as many things can be demonstrated there. Demonstration work done outside of a central institution, where more careful and broader-line work is conducted, is important. One of the most important things is to have proper equipment, so that proper training can be given for supervision of the smaller work outside. Such work requires men who have been both scientifically and practically trained; those with practical training only cannot carry on such work.

The short courses at the College are made as practical as possible, and farmers get a good deal that they can put into practice at home. 5 or 6 consecutive lessons in the summer at an apple orchard in connection with the demonstration work would be of great value. Demonstrations could also be given in vegetable growing and in connection with the marketing and business end, which at present is neglected. Apples and potatoes would give the best response for the best practice resulting from technical education.

FARMING AT MACDONALD COLLEGE.

Information obtained from MR. JOHN FIXTER, Farm Superintendent at Macdonald College.

The impression farmers carry away from a visit to an illustration or experimental farm is worth two or three times more than reading bulletins. There is nothing as good in the way of educating people as showing them what they can do on their own farms. Men should go from central stations to help the farmers themselves on their farms; this encourages competition on the part of the neighboring farmers, thus raising the level generally. If the College were associated with alfalfa demonstrations by successfully growing alfalfa on its own farms, more farmers' sons would come to the college; and if the college sent men out for illustration work, they would come more in touch with the people, and the farmers would have more faith in them.

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A COLLEGE FARM THAT PAYS.

The College farm crops are the same as those grown in the Province—cereals, fodder, hay, etc.,—but the following table shows that the crops on this farm were twice as large as those of the balance of the Province of Quebec, and they were also worth more than twice the value, while the land is getting richer under our system. We raise enough manure to enrich the land, and our methods of cultivation make it cleaner. In $4\frac{1}{2}$ years fields have been cleaned which were dirty on taking over the farm; and systematic rotation prevents the fields from getting dirty again.

We keep account of every hour's work, and pay for everything. The accounts show profit on the individual crops, so that the farm pays. The average farmer who follows our instruction can double the product of his farm without increasing the labor account disproportionately. There is no reason why the same methods cannot be applied to the whole Province.

COMPARISON OF CROP YIELDS.

AVERAGE CROP YIELDS, 1910	HAY tons. lbs.	CORN tons. lbs.	OATS. Bus. lbs.	BARLEY Bus. lbs.	ROOTS Bus. lbs.
Macdonald College.....	4 984	18 657	56 17	46 13	1000 23
Quebec Province.....	1 1560	9 240	29 22	24 2	324 30
Ontario Province.....	1 1680	9 800	39 13	29 36	426 54
Canada generally.....	1 1640	9 760	32 27	24 30	402 20

A study of the above table will show that there is great room for improvement in the methods carried out on the average farm of this country.

COMPARISON OF VALUE OF CROPS.

Taking as a basis the above actual figures of yields of various crops at Macdonald College in 1910, the following comparisons are still more astounding, showing how crop values could be more than doubled by adopting the methods in vogue at the College.

Crop	Value of 1910 crops of Canada according to Census Bulletin	Value of 1910 crops in Canada if yield equalled College crops	Value of 1910 crops in Quebec by Census Bulletin	Value of crops if yield equalled College crops.
Hay and Clover.....	\$149,716,000	\$374,290,000	\$51,114,000	\$127,785,000
Oats.....	114,365,000	197,000,000	21,626,000	41,185,000
Barley.....	21,400,300	40,277,000	1,816,000	3,208,000
Roots.....	21,444,000	53,823,000	3,556,000	11,074,000
Corn.....	11,957,000	24,000,000	1,703,000	3,518,000
	\$318,882,300	\$689,390,000	\$79,815,000	\$186,770,000

IMPORTANCE OF DEMONSTRATION FARMS.

While a vast amount of information has been distributed from Experimental Farms, which has been put into practice by the up-to-date, shrewd business farmer, very few of the many who attend institutes, visit experimental farms and colleges, and listen to addresses, put such advice into practice, although it is practice rather than knowledge that makes the successful farmer. The reason for this apparent indifference lies in the fact that the advice given by experts at meetings, etc., must necessarily be of a general character, and as no two farmers have the same conditions to contend with, and therefore cannot carry out the needed improvements in the same way, the individual farmer is afraid to venture on new methods without being sure that they will be successful. What is needed is that the expert should help the farmer on his own farm to achieve the desired result, after which financial result through his own efforts would follow. This would arouse general interest in the neighborhood, and public meetings could be held on the illustration farm for the discussion of farm management, with practical demonstrations.

KIND OF DEMONSTRATIONS NEEDED.

Rotation of crops; its benefit in enriching the soil. Selection and cleaning of seed. The growing of alfalfa and corn and roots. The advantage of thorough preparation of the soil; deep in the autumn with implements that will not bring the subsoil to the surface; shallow and thorough preparation in springtime, and especially working the soil when it is in the right condition. Importance of intensive tilling during the period of the growing crop. Conservation of soil moisture. The importance of a high content of humus in the soil. The uses of legumes, their value as fertilizers. Best methods of applying barnyard manure. Destruction of weeds and insects. The accomplishing of more work in a day by using more horse power and better implements, and the use of implements on hand to do better work. The value of underdraining, how to instal it. Keeping an account of each farm product in order to know from which the gain or loss arises.

HOW BOYS PROFIT BY DEMONSTRATIONS.

Mr. Fixter submitted a list of 100 boys in the Corn Clubs of the Southern States who, under the Farmers' Co-operative Demonstration work of the United States Department of Agriculture, made an average of 133.7 bushels of corn per acre in 1910. These are not all the boys who made large yields; reports received duly show yields above 100 bushels although the highest average yield recorded in the United States for that year as made by farmers is 47.9 bushels per acre, while the figures run as low as 12.6 bushels per acre.

SECTION 2: THE COLLEGE IN RELATION TO THE TRAINING OF TEACHERS.

Information obtained from DR. S. B. SINCLAIR, Head of the School for Teachers of Macdonald College.

Undoubtedly a teacher requires, in addition to ordinary scholarship, professional training—which in one sense is technical training—and the teacher's

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value is increased thereby. This training should combine the investigation of the child mind and social conditions, supplemented and reinforced by the history of education in other countries and comparative studies of different educational systems.

No training is worth while unless it brings the teacher into actual contact with conditions of school practice and particular forms of work (such as Manual Training, Nature Study, etc.) which she will be expected to teach; but experience of that sort alone, without enlightened education would not be sufficient. All the help of accumulated knowledge should be given, plus experience in actual teaching and doing and managing.

The modern movement in education retains the best elements of the older education—what might be called the “sound training” or the “three R’s”, and without having the child ignorant of these “core” subjects, he can add other and more practical subjects admitted by modern life and modern society. Manual Training in any form is not a hindrance to progress in the three R’s.

THE IDEAL EDUCATION.

The best education for a child would be to devote a third of the time to the “humanities”; a third to science including arithmetic, Nature Study and natural science in various forms; and a third to sensory-motor forms of activity, such as Manual Training, oral reading, writing, vocal music, relief-map-work, and later on, woodwork, cooking and sewing. That would be a working hypothesis.

Reading can be taught faster in connection with words that concern a child’s active operations; and the modern method of teaching reading—by phonetics on one side and the sight reading on the other—renders it necessary from the very beginning for the child to have books that interest him, i.e., on subjects closest to his own experience. Children who a year ago did not know a letter, now recognize at once such words as “manipulation” and “Macdonald College” when written on the board. They have in themselves the power to recognize as a form almost any word that is presented to them, and this power is gained by teaching the sounds of those letters and by having the child read silently a word in which he is interested. The words have, in the main, a direct meaning to him, and the lesson correlates them more closely to his activity. A reading lesson under a trained teacher on something that the child has been doing in his garden will enable a child to read in half the time of the old method. On the whole children are more interested in the Nature Study lessons than any others.

NEED OF TRAINING THROUGH WORK.

There should be sensory-motor training for all children, not necessarily technical or conventional, but something that issues from labor that satisfies the child; and it is well to have such work grow out of some life experience which leads somewhere, as in the planting of a tree, etc. If a child does no work till it reaches adolescence it may be neither able nor willing to work afterwards; and the prevention of a child from doing useful and beautiful work with his hands till 14 would prevent him from becoming a satisfied workman.

Cooking is a particularly good form of Manual Training activity, hence Domestic Science should come under the head of Manual Training, because it lends itself specially to the carrying out of design and the working out of the idea of the child in expression, and the getting of results fairly quickly—all of which are necessary at that time of life. It would not be a good plan to leave Manual Training, Domestic Science and Nature Study out of the elementary schools and give them more time in High School, because one-third of the time should be devoted to preliminary training leading up to this work.

WHEN STUDIES SHOULD BEGIN.

A child of seven or eight is just where Nature Study proper should come in, for he is at the stage when he is looking for the beginning, middle and end of things, and is working to develop skill in certain ways; and while he would not be a scientific gardener he would be learning the elements of gardening and learning what would prepare him for the elements of work in later years. Cooking also should be begun at 10 years of age. Postponing Manual Training and Nature Study subjects till High School would not give a child as good a chance to learn the 3 R's, nor to become a good citizen. Elementary science as a preparation for the science work of the University would give pupils a better sense of proportion as regards values of knowledge.

The introduction of sensory-motor activities in earlier years is necessary, but difficult, and can only be done by trained teachers who know how to deal with those subjects. Hence, unless the rural school is large and the population wealthy, consolidated schools would be better, with male teachers in some of them. The expense of consolidated schools could be largely reduced if the teacher lived in the smaller of two sections, and drove the children to school and back; and this would also give the benefit of supervision. This and the training of teachers are the conditions, and the Government should assist.

NATURAL POWERS SHOULD BE DEVELOPED.

In a system of elementary education the children should be trained how best to use the powers naturally developed by education so that they could not be easily exploited by more powerful and more intelligent people. The pupils' activities should be so directed that they will develop individuality, initiative, leadership and strength of personality. Social ethics can be taught in the lower school to a certain extent if the teacher's personality is strong enough; and at the beginning of the adolescent period a training in the facts of industry, the production of wealth and its distribution, might be brought in, correlated with other work. Civics and history can be taken together. Children in the fourth book should know something of the changes in production and distribution brought about by machinery, and the consequent relationship of the worker to his employment. Of course this should not be introduced too early, but the beginning of the adolescent period would be about the right time.

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SECTION 3: THE COLLEGE IN RELATION TO HOUSEHOLD
SCIENCE AND ARTS.

Information obtained from MISS CATHERINE A. FISHER, Head of the School of Household Science of Macdonald College.

The students in the School for Teachers take a short course in Domestic Science, but they merely get an initiation into the subject, and not enough to carry on much work in their schools. It would help them if the course were modified so as to teach the value of foods, and methods of sanitation and ventilation.

Girls take up Domestic Science as an entirely new subject after spending several years in academy subjects, and consequently cannot make as rapid progress in it unless they give it more time. Domestic Science subjects should be introduced into the elementary school, so that girls know something of it before they come for their professional course.

A two years' course would probably give them enough to teach the subject in an elementary school in a limited way, but in order to make the work valuable in a school it is necessary for teachers to be thoroughly acquainted with the subject-matter, which can only be done by giving as much time to it as to other subjects.

DEMAND FOR TRAINED WOMEN.

There is an increasing demand for trained women in institutions, and the supply is not sufficient. Native talent does not take the place of training, but the higher the talent, the better is the result of training.

The professional course should be developed in Canada, as there is such a demand for trained women. Hospitals demand trained dieticians, and we have to take American-trained teachers.

Dressmaking and millinery should be taught in elementary schools, and very young girls can take sewing as manual training, purely from the manipulative side. Millinery could be developed to great advantage in a professional way as well, by trade schools which prepare supervisors and leaders and teachers, because we have not got these, and need them.

TRAINING OF SUPERVISORS.

It would be a splendid thing for Canada in adopting technical training for women, to attempt first to train supervisors and teachers. This would be advanced technical training; but girls at school could be taught sufficient to use it in their own homes, without taking the more advanced work unless they had special aptitude. The harmonizing of colors can be taught and cultivated to a certain extent; there is prime need for this knowledge, and all girls taking household science should include the study of color.

There is so much science involved in cooking that girls should take pure science subjects along with it, and it is not the best use of time to give them that until they are able to take it along with pure science.

SECTION 4: THE BEARING OF SCIENCES UPON EDUCATION AND RURAL LIFE.

BIOLOGY.

Information obtained from MR. WM. LOCHHEAD, Professor of Biology at Macdonald College.

It is very difficult to ascertain the percentage of injury to cereal crops from diseases and weeds, because so many farmers do not recognize them; 10% would be a low estimate of the loss through smut and other common diseases in Ontario, and 60% to 75% of that loss could be prevented without much expense by good farming, good drainage, good cultivation, by keeping down weeds which harbor fungus pests, as well as by spraying and using chemicals and treating seed. The crop would be increased by good farming, and thus compensate the farmer for his trouble. The healthier the plants are kept, the less danger of fungus there will be. Some diseases cannot be treated except by good farming, but smuts and many others could be prevented, and from 50% to 75% per cent. of diseases can be treated. By an intelligent knowledge of insects and their habits many diseases could be prevented, and the best remedy for insect pests is rotation of crops. In orchard crops the codling worm and plum curculio can be controlled almost entirely by spraying, and 90% to 100% of the fruit sold as first-class.

In teaching Biology, it is preferable to use the common things with which students are familiar, and make them apply their knowledge to everyday life. This makes it more interesting and consequently a better means of education, strengthening the science rather than weakening it. A subject of economic importance should be chosen as an illustration. Owing to the difficulty of getting material for Biology in winter, it would be a good plan to take this subject in spring and fall, and Physics in winter.

Students who take the long course are well trained in Biology and understand the principles of processes of prevention of insect pests, and the courses are so correlated that while they are getting the course in Biology proper, weeds and insect pests, they are also getting a course in farm crops, which prepares them for the question of remedies. Students in the School for Teachers get a course in Physiology.

SHORT COURSES, ILLUSTRATION PLOTS, ETC.

Short course students get more information relatively than any other class, for they come with definite purpose, are mature, and have had practical experience, all of which helps them to realize the importance of the teaching and to assimilate a large proportion of it. Their training is best described as elementary rather than superficial; it is really intense, for as they cannot cover a wide field, the information must be confined to a few topics in order to make it valuable.

A central illustration plot and School Garden at a place convenient for farmers, where short lectures on weeds, insects and diseases could be given in summer evenings, would be helpful. The difficulty would be to make the lessons short

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enough. The best way to reach such people is by demonstration, and with specimens in that School Garden much could be shown in an hour regarding the loss caused by pests, weeds and fungus diseases.

The Quebec Society for the Protection of Plants has done good work, and the Pomological Society does similar work for fruit growers, the Department of Agriculture providing the money.

If the students could have access to the Experimental Farms for research work, it would make a greater impression on the farmers. A contribution from the Dominion towards the training of students to carry out investigations would be excellent, and it is most difficult to get such men.

The College is connected with the Journal of Agriculture, and by this means is able to reach the farmers better. Dominion funds might be legitimately used for the dissemination of knowledge through a subsidized press, in the form of bulletins, etc. The more intelligent farmers appreciate the bulletins, and the demand is increasing rapidly.

Some farmers claim that cultivation and drainage, without spraying, will check codling moth, but the best fruit growers adopt all three, and find it pays.

With regard to the best plan to adopt for the improvement of rural education much has been said in recent years, but still there is room for discussion. Just what form the initial movement should take is an important matter. It seems to me, however, that the following plan would be practicable and would at the same time lead to most valuable educational results:—

(a.) The Government to build, equip, and partially maintain, six or more schools in those rural parts of the province where the grade of school is elementary.

(b.) Each Government school to serve specially the needs of the more advanced pupils of several sections, and to act as a continuation agricultural school where, in addition to the ordinary school subjects, elementary agriculture and household science are taught;

(c.) The employment of well-paid, qualified teachers for these schools, preferably graduates of Macdonald College;

(d.) The employment during the summer months of such of these teachers as are specially qualified, as agents of the Provincial Department of Agriculture to help and advise the farmers of the district to organize active farmers' and women's institutes or societies, and to conduct special short courses in agriculture as time will permit; and

(e.) The Government to add to the number of such schools year by year or as fast as the supply of qualified teachers can be found for the work.

This plan does not disturb the existing order of things, but does provide a means whereby the older boys and girls may secure some adequate preparation for their life work. It would involve an outlay of, say, \$20,000 a year on the part of the Government, but the ultimate benefit to the province would, I feel sure, be beyond money value.

PHYSICS.

Information obtained from DR. C. J. LYNDE, Professor of Physics at Macdonald College.*

There is no difficulty in finding subject matter for Physics courses relating to the common things of the house and farm, and this gives a boy a much better grip on the subject than the old classical course, whilst not in the least limiting his understanding of the big things of Physics.

Boys at Macdonald College are not allowed any textbook for the first three months, and are kept down to the ordinary things they have known all their lives in connection with farm and domestic operations, with the simplest material borrowed from their homes or stores.

The principles of Physics could be easily taught to young children in connection with Nature Study, because they are naturally of an enquiring turn, and want to be experimenting and finding out things. Boys would understand mathematics much better if they were given Physics sooner, in connection with it; and the elements of Physics could well be taught in connection with Manual Training, part of the time being taken from the arithmetic period; and a fundamental knowledge of Physics would be of great benefit to boys going to a more special industrial school after 14, as it would enable them to understand mechanical drawing, while, on the other hand, they cannot understand mechanical drawing without knowing the fundamental principles of Physics.

Machinery is becoming more common on the farm, and the farmers' children should know more about Mechanics and Physics. The pupils of the School of Agriculture and the teachers-in-training are given instruction regarding water supply, which is not a difficult matter for anyone who understand Mechanics and Physics; and a water supply in country districts would improve the standard of living, make things easier for the women, and thus leave them more time to devote to their families.

CORRESPONDENCE COURSE SUGGESTED.

A correspondence course could easily be arranged on the Physics of soil, the handling of farm machinery, and kindred subjects; and such a course would mean money back to the whole country in increased crops. Instead of bulletins from the Experimental Farm at Ottawa, as now issued, a general course could be systematized, and the bulletins amplified so as to form a reading course for farmers. This would not be regarded as interfering with Provincial privileges in education. The staff of Macdonald College could easily perform such a service for a given area, if the money were furnished, and institutions would not need to be increased. \$1,000 thus spent would bring back more good to Canada through existing institutions than through new ones.

* For Dr. Lynde's valuable memorandum "Suggestions regarding the Teaching of Physics and Chemistry in the Elementary and High Schools of Canada"—see Part II, page 124.

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WHAT A BOY SHOULD KNOW.

A boy of 14 going into industrial life should have been taught enough Physics to make him useful. He should be familiar with the lever principle, which he will constantly find applied, also the principles of pulleys, wheels, axles, inclined planes and ordinary simple machines; perhaps he could also have learned the theory of liquids, pressure, pumps, etc., the principles of heat, and the various kinds of heat engines, which knowledge would make him still more valuable. A boy of 14 could easily be taught all that, but not on the old methods. The valuable principles can be reduced to a fixed number, which he should know at 14; after that more new principles could be added, and a course could be carried right through to Secondary and University Education, so correlated that it would be of value to those going into professions. It is merely a matter of going deeper into certain principles for those who wish to proceed further.

Boys here are taught simple experiments with ordinary tools and implements involving the lever principle, and they make the application—e.g., they will select the best fork for loading a hay wagon, and know the reason. A boy going into a factory would have made the principles he has learned part of his life so that he does not forget them, and thus becomes a far more intelligent man. He would do things for a reason, and would be more valuable for having learnt Physics, as he would know what is behind what he is doing; and this study will also make him more adaptable, because if he has been properly taught he sees all that is correlated to his work. The interest in Physics is a natural one, which will grow with the boy, and it is one of the studies that lends itself as impressively as any to getting a boy to understand the relation between cause and effect.

NATURE STUDY.

Information obtained from DR. JOHN BRITTAIN, Professor of Nature Study at Macdonald College.

In teaching Nature Study to students, it is preferable to use familiar objects from the fields and neighborhood. Botany is here taught to show students how plants live and grow, not for the sake of classification. The old botany text-books would rather repel children than attract them.

Children should learn some things about plants when they are quite young; others they cannot learn till their reason is more developed. It is no use appealing to a child's reasoning powers before 10 years old at the earliest. A child of 11 or 12 could begin to understand and appreciate instruction which he could turn to account on the farm, and at that time there would be industrial as well as educational or cultural value in the teaching.

The beautiful should be taught as well as the useful, for a child sees the beauty of a flower before it knows how it grows. The economic or homekeeping value can be given at an early age, and the mind can get some benefit for economic use afterwards in the house from the Nature Study work in the class room.

NATURE STUDY IN LANGUAGE TEACHING.

Nature Study work for observation and subsequent recording trains children to express themselves accurately and reason to a definite conclusion. Every child should base its compositions, or efforts at expression in language, on observations of things which it has seen, felt and understood. Nature Study properly carried on may be a means of improving the use of language.

Cheap and simple equipment of a Nature Study laboratory is preferable for an elementary country school. The average cost would be \$5 or \$6 a year, perhaps a little more the first year.

A School Garden is a desirable part of the equipment, but to be any use it must be well kept. If a proper one is not possible, it is better to have just a few small plots or window-gardens.

A School Garden should be at least an acre; half for playground, the rest for trees, shrubs and plots. Two acres would be better, so that they might grow some of the native trees and study them. Thus the school would be made a centre of attraction, and at the same time would teach the children to enjoy country life. Young people might go a School Garden occasionally on summer evenings if it were made interesting. It might be made a centre for social gatherings, thus uniting social and educational opportunities.

Illustration plots would be of advantage to parents, but children are too young to care for economic problems, and have to be appealed to through their sentiment and emotions. We can only get young people to stay in the country by getting them interested in country things—birds, cattle and plants; people stay where they love to be and where they are interested.

MEN AND WOMEN ASSIST TEACHERS.

A young teacher of 18 who has been well trained in Nature Study could teach many things about plants and animals that would make boys more intelligent farmers, though she could not teach practical agriculture, which cannot be taught in school. Capable men in the locality who understood children, and how to teach them, might give volunteer service for half a day once a month to the older boys. Both men and women are needed in teaching, and as rural teachers are usually young, it might be well to associate with them maturer men and women from the neighborhood, provided they were well prepared for the work; but some men would do a lot more harm than good. It is easier to find County Councillors than right men for teaching. While the school merits more service than do roads and bridges, public sentiment does not yet recognize that.

The surroundings of a school should have natural beauty, and be well kept. The children should be encouraged to grow things at home and exhibit or study them at school.

There is no reason why they should not be successful farmers, and no need for them to be poor in the country. Young people leave the country because they see their way to better advancement in the cities, and if there were a wider dissemination of the knowledge of good things in the country, perhaps some of these young people would stay.

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CHEMISTRY.

Information obtained from DR. JOHN SNELL, Professor of Chemistry at Macdonald College.

Chemistry is to a certain extent an abstract subject, and not easily grasped. It is usually introduced with a study of water. A paper-maker could hardly learn the constituents of subjects such as cellulose if he had only the elements of education.

Evening classes for bakers and confectionery makers could be arranged without much cost. Students here should get a reasonably clear knowledge of flour and water. Such a knowledge would be of value to bakers, as also would a knowledge of yeast processes and their bearing on the making of bread. It is proper for the High School to include work in Chemistry as related to the value of foods.

Students in agricultural chemistry here make determinations of fertilizers, but could not make an analysis. They should do enough to give them a clear idea of the fertilizing constituents and help them to understand terms met in their reading, but it is not necessary for them to make an analysis of soil. Demonstrations in class give them a chance of finding out whether they really understand or not.

CHAPTER XLI: SUMMARY OF REPORTS BY THE LOCAL COUNCIL OF WOMEN OF MONTREAL.

The following reports, including statements of individual members and affiliated Societies, upon the industrial and technical education of women, were submitted by the Local Council of Women.

In so far as reference is made to the school system and to educational establishments, *Protestant institutions only* are considered. In treating of women in industrial and commercial pursuits, no distinctions of religion or race were drawn.

SECTION 1: GENERAL REPORT ON WOMEN'S WORK.

(By MISS C. DERICK, M.A., Assistant Professor of Botany at McGill University, and President of the Local Council of Women.)

Many people are uneasy at the employment of a large number of women and girls in wage-earning positions (probably about 33% of those between 15 and 24.) Economic changes have taken women's work from the home to the shop; the home is still the centre, but has become the centre of consumption instead of production, thus losing many of its educational functions. It has therefore become necessary for girls to take up definite work outside the home, to gain the mental and moral discipline resulting from the performance of regular duties and save them from seeking idle tasks to fill idle days.

A woman's work is to her the same source of strength and pleasure as to a man; self-respect is deepened by economic independence and her true womanliness is only fully revealed when every power is given opportunity of exercise. But this ideal has yet to be realized. In partial adjustment to new conditions, abuses have arisen; the remedy is not in restriction, but in liberty, provided that protection is given to children, that a good primary training followed by vocational training is open to all, and that reasonable hours, sanitary surroundings and fair remuneration are secured for all alike through legislation. This would deplete the ranks of the unskilled and thus improve the conditions of the labor market. The power derived from training and the stimulus given by the opening of all the highest positions to women would combine to produce desirable changes in their economic and social condition which restriction could never secure.

Fuller opportunities for vocational training are likely to be afforded. The Commercial and Technical High School has evening classes for both sexes, and others will follow soon. In the medical profession especially there is room for women as sanitary and school inspectors, teachers of hygiene, etc. There are post-graduate courses at McGill, but no undergraduate courses for those.

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The aim of the inquiry was to include as many kinds of industries as possible, and more than one establishment of each kind, in order that a general view of the whole situation might be obtained. The establishments visited were with few exceptions of the larger and higher type, so that the facts represent the highest rather than the lowest level of the existent industrial conditions.

The scope of the inquiry was broad in character, and questions were addressed to both employers and representative employees.

The employers were asked to give the *number* of women employees, the minimum age of admission; the minimum, average and maximum *wage*, the proportion of *skilled* and *unskilled* workers, the manner or place of training, the possibility of promotion, the desirability of previous industrial or technical training; whether this should be included in the public school system or in day continuation schools; the desirability and value of evening classes, both educational and technical; the educational standards of employees; whether difficulty existed in enforcing labor laws, and the relation thereto of compulsory education; also the possibility of co-operation of employers in industrial training.

The employees, in addition to many of the foregoing questions, were asked what they would consider a living wage, whether they desired or would take advantage of evening classes, whether comfortable boarding houses were easily obtainable, and desirable recreations within their reach; if they had any knowledge of labor laws, and what improvements in the condition of women wage-earners they would suggest.

The results of the inquiry may for clearness and convenience be grouped under three heads:

1st. Women in clerical and commercial positions, e. g. secretaries, typewriters, book-keepers, stenographers, etc., in banks, offices and industrial establishments. Telephone operators were here included.

2nd. Saleswomen in shops.

3rd. Women in industrial establishments (excluding clerks, etc.)

GROUP 1: WOMEN IN CLERICAL AND COMMERCIAL POSITIONS.

This class of occupation offers suitable employment for properly qualified women. There is a constant demand for women stenographers and clerks in business and professional firms, and within the last few years this has extended to the banks. Clerical work is congenial, the surroundings are generally comparatively good, the hours of employment reasonable, and the chance of a living wage and of steady employment is afforded. Women who have received a good secondary education and are well grounded in English, and who have had a thorough business training have no difficulty whatever in obtaining good positions, with the prospect of rapid advancement.

Women employed in banks begin at \$400 or \$500 a year.

Stenographers earn from \$600 to \$1,200 a year, in exceptional cases even as high as \$1,500, although young girls may begin at \$25.00 a month. The majority are handicapped by a deficient education; the lack of knowledge of their own language, of spelling, punctuation, and of elementary composition and letter-

writing is a matter of general comment. After short courses at one of the private business schools, these young women seek employment for which they are only partially trained. Small wonder if their work is more or less unsatisfactory to their employers; nor can they themselves ever hope to attain to the more responsible and remunerative positions. These are reserved for the exceptional or thoroughly trained woman.

In this group of wage-earners have been included the telephone operators. In Montreal there are at least 800 women employed who earn from \$20.00 to \$80.00 per month, according to their efficiency. These employees are trained by the Company, and the work is arranged in three shifts. Work at night and on Sundays is more highly paid. Apart from the nervous strain, which appears unavoidable, telephone operating seems a desirable employment for women.

Business and commercial training—apart from the four years' course offered by the Commercial and Technical High School—is at present chiefly to be obtained in private business schools. Short courses undoubtedly appeal very strongly to the immature and inexperienced and to those who are anxious to earn a living as soon as possible. The business school not only gives the desired instruction, but quite frequently acts as an employment bureau.

The advisability of instituting short commercial courses in Technical Schools, open to those already well grounded in English, and affording a thoroughly practical business training, is, we believe, worthy of consideration. There is an ever increasing demand for such courses.

GROUP 2: SALESWOMEN IN SHOPS.

There are many women wage-earners in shops who come under Group 1, and some, those engaged in millinery and dressmaking, are included in Group 3. In Group 2 are included only those engaged in selling.

In the higher grade department stores there are very few girls of 14 years of age, and these few generally act as errand girls. In less highgrade establishments and smaller shops, young girls may more frequently be seen, but at present not to such an extent as some years ago, before the introduction of the various cash-carrying systems.

Comparing the position of the shop-girl with that of the girl in domestic service:—

The shop-girl has clearly defined duties, and her hours of work have a definite limit, generally from 8 o'clock in the morning to 5.30 or 6 at night (with some exceptions), all her evenings and Sundays are free, and during these leisure hours she is her own mistress. At her work she is under the same supervision and discipline as her associates; from the moment she leaves her work till she returns to it, she is practically free to choose her own society and take what recreation she prefers without let or hindrance. She considers that her social position is superior to that of a domestic servant, and as evidence of this she is addressed as Miss (or Mrs.), while the domestic is called by the Christian name. Again, she is not at the constant beck and call of one individual, confined to one house and the monotony of the daily round, but goes to and from her work, and is brought in contact

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with an ever varying stream of life which lends an interest and even a charm to her environment.

The disadvantages, not always realized, are sufficiently grave, but might be easily obviated. She often has but scant home comforts, perhaps has to prepare her own hurried breakfast, she must face the weather at all times; in many establishments she is required to stand the whole day long, not being permitted to sit down for an instant, a requirement most assuredly injurious to her physical well-being. Frequently the ventilation is extremely bad, and the employee constantly breathes a vitiated atmosphere, with sometimes extremes of temperature and exposure to draughts. Her wage is very often barely sufficient for her maintenance, and she may have difficulty in making both ends meet. In her leisure hour she naturally seeks amusement and relaxation, only to find that, as a general rule, recreation of a desirable character is offered to her only at prohibitive prices. If she is boarding, she seldom has any place in which to receive her friends, and very often there is no one to whom she can look for authoritative guidance. And thus it is that in an innocent search for pleasure natural to all, she is frequently exposed to temptations of a particularly insidious nature, the true character of which she sometimes does not recognize till too late.

There is a distinct need for comfortable and respectable boarding accommodation at reasonable rates, for working girls of all classes. It is to be hoped that there may soon be a business women's hotel. There should also be social clubs for working girls, affording parlours and halls, where innocent and desirable recreations might be provided and where both men and women might pleasantly mingle together in a thoroughly wholesome environment.

The work being done by the Y.W.C.A. is most excellent, but does not more than begin to meet the need.

GROUP 3: WOMEN IN INDUSTRIAL ESTABLISHMENTS.

In this group the inquiry was addressed to seventy-one (71) establishments. In about 22 instances no report could be obtained. There was either an absolute refusal to answer, a polite but repeated evasion, or a failure to send the promised answer.

Out of 71 establishments, 49 employers responded to the enquiry. 25 different kinds of industry were included, and reports were given of 22. A table is appended giving the number and varieties of industries, with approximate number of women employees, wages, hours of employment, standard of education, etc., etc., from which particular conclusions may be drawn if desired. The more general conclusions of the committee may be summarized as follows:

In most of the industries there is very little demand on the part of the employers for girls under the legal limit. Often the work is too heavy for young girls. In some instances no effort is made to ascertain the ages of the younger employees, more particularly where there is a scarcity of hands; this is more especially the case in large mills, and it is in such cases that the labor laws need stricter enforcement.

The minimum wage in most factories is about \$2.00 per week (occasionally as low as \$1.75) for untrained hands. In factories new and inexperienced hands

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are at first put on a weekly wage while being taught the work, but are in a short time advanced to piece-work. For piece-workers there is very seldom any promotion other than increased earning power up to a certain maximum limit. Only in very exceptional cases has the worker an opportunity of being transferred to a different department or a higher grade of work. She is doomed to go on working at one little process—and her wages depend entirely on the degree of manual dexterity and unremitting industry of the individual. If she is deft and industrious and works full time, she can earn a comparatively good wage—from \$10.00 to \$15.00 per week. A few exceptional women in exceptional industries earn as much as \$20.00 or \$25.00 per week. In laundries the workers have more chance of learning the whole process and those who are skilful ironers may earn on piece-work \$12 to \$15 (max.) per week.

The conditions in dressmaking and millinery establishments are somewhat different. Young girls absolutely unskilled are taken in as apprentices, and not paid at all or begin with an allowance for carfare or 50 cents a week. They have a chance of learning most parts of the business, with the exception of cutting and fitting, and are paid according to their ability from \$1.00 to \$10.50 per week. Really skilled workers get from \$11 to \$25 or even \$30 per week.

In the custom tailoring establishments the work is nearly all skilled and wages range from \$5.00 up—the maximum for women being about \$20 or \$25 per week. There is a demand for skilled workers for which there is no corresponding supply here. The tailors state that they find it necessary to import labor, under great difficulties. There is no opportunity for acquiring such training at present in Montreal.

There is a demand on the part of the employers and employees alike for training in needlework and machine operating—also for skilled workers in leather and for skilled laundresses.

Employees desire opportunities for the acquirement of French or English, a better primary education, facilities for training not only in hand sewing, machine operating, cooking, millinery and dressmaking but an opportunity for obtaining such a training as would give them at least a chance of entering the various industries as skilled workers, at a fair wage. When they enter as unskilled hands, there is no prospect of promotion before them. The vast majority of women workers fall into the unskilled class—those ranked as skilled are frequently merely deft at one small process.

Factory employees place the minimum living wage at \$7.00 per week, but others place it at \$8 or \$9 or even \$10 per week, and as an ordinary worker earns from \$4.50 to \$5.50 per week, the average worker is not paid a living wage and is therefore not economically independent. A great many girls live at home or with friends and relatives, and in this way are boarded at low rates or contribute to the support of the family. Board outside the family cannot be obtained under \$3.50 or \$4 per week. The balance of the wages has to go for clothing, car-fare, recreation and incidental expenses.

Employers, as a rule, approve of evening classes, in theory at least. It is felt that the opportunity should be afforded workers of improving their education, academic, commercial or industrial. In practice, however, many disapprove

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strongly. They state that after working ten hours a day, the body and mind are fatigued and the evening should be spent in recreation. The strain of attending classes in the evening is too great and unfits them for the daily work.

As a matter of fact, there is small evidence of women in factories taking advantage of the evening classes already opened. It is the wage-earners of the 1st and 2nd groups and domestic servants who attend evening classes at present.

Women wage-earners are absolutely ignorant of labor laws, only being familiar with the particular conditions which affect them individually. Some of them suggest shorter hours or better pay.

Finally, in regard to the educational standards, the average shop woman has had a primary education of some sort, but seldom up to the highest grade—she can read and write and do simple arithmetic. In many factories the majority of the employees are utterly illiterate, others can barely read, or read and write with difficulty. In no single instance has the standard been considered sufficiently high. There has been an almost unanimous expression of opinion in favor of compulsory education. At present whether the child attends school or not rests with the parents; it is impossible to obtain statistics in regard to the number who never attend school. The question arises: What are the girls doing who leave school at from 9 or 10 to 14, who are not permitted by law to work in shops and factories?

RECOMMENDATION OF THE LOCAL COUNCIL OF WOMEN.

The results of the inquiry which have been submitted to you are in harmony with those obtained in the United States and Great Britain, and lend support to several reforms which the Local Council has tried at various times to secure. The conclusions of the Local Council may be summarized as follows;—

1. A school census should be taken yearly.
2. Education should be compulsory, at least between the ages of 5 and 14, and devoted entirely to general education. Vocational training should be deferred until this preliminary training is completed.
3. In order to supplement the work of the primary schools by giving opportunities for further training to those who are already at work, evening classes should be provided. They should be of three types:
 - (a) Continuation classes giving the elements of a general education.
 - (b) Recreational classes, for developing varied interests and for imparting a knowledge of domestic science.
 - (c) Trade classes for teaching all parts of different industries, increasing skill and serving as an aid to promotion.
4. Free Day Trade Schools should be established for those who have completed the Primary School course.
5. There should be Commercial and Technical High Schools, qualifying students to enter into higher grades of work and meeting the needs of those who can continue in school for at least four years after the Public School course has been completed. Shorter courses might be arranged for those who are obliged to enter gainful occupations before they are 18.

6. Provision for higher technical and professional training should also be made.
7. Employment Bureaux, making a close connection between schools and employers, should be established.

SECTION 2: AS TO THE CANADIAN HANDICRAFTS GUILD.

(By Miss PHILLIPS.)

The aim of the Guild is to encourage, revive, retain and develop Canadian Handicrafts and Art Industries throughout the Dominion, such as,

Weaving	Lace-making
Woodcarving	Embroidery
Pottery	Leather-work
Basketry	Metal-work
Rug-making	Bookbinding
Sewing	Knitting
Furniture	Glass-blowing.

This is done by,

1. The establishment of good standards.
2. Educative exhibits sent to provincial exhibitions and county fairs.
3. Judges supplied to such exhibitions who give criticisms to those who desire them.
4. Instruction given by correspondence.
5. Literature and magazine on special crafts sent to workers in out of the way places.
6. Advice given by members of our Committee during the summer in country districts.
7. Lessons given by volunteers.
8. Prize competitions judged by experts, whose criticisms are passed on to craftsmen when advisable.
9. The offer by the Guild for selling good work.

Notices have been sent to craftsmen and women now on the Guild books, for a prize competition to be held in February.

Many classes have taken advantage of the opportunities offered by the Guild. We welcome work from the highly cultured or from the unlettered peasant. Prices are fixed by the worker to the Guild, no commission being charged for selling. When prohibitive prices are asked, the Guild advises the craftsman that sale will be difficult, perhaps impossible, and they are at liberty to reduce or not at their discretion. The Guild has paid to workers within the past five years about \$24,000 to \$25,000.

The number of crafts represented is increasing; the quality of the work is improving; colors are combined more harmoniously, and the use of the vegetable and natural dyes better appreciated. Workers begin to understand the value of promptness and precision in the execution of orders, and are generally better

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able to understand business-like ways and to conform to them. At first it was difficult to get some of them to keep their promises.

The Guild is prepared to give lessons in certain crafts and is planning to send out instructors in the near future.

There seems to be a growing feeling that the curriculum of schools is already over-crowded. The Guild holds that instead of adding to the burden of the growing child, the study of the arts should be delayed and taken up when the young people, having left school, are first feeling their way toward balance and self control, a way that is made vastly more attractive by the existence of an absorbing interest in congenial and beautiful work.

We desire to bring particularly to the rural population through those means contentment and well-being, and to stem the stream from country to town, which is recognized as a strain on both town and country. We wish to bring to the country people the advantages of the town and to avoid concentrating in the town such advantages as can, with our organization, be carried to even remote parts of the Dominion.

It should be remembered that though the Guild buys and sells, it is not, and is not intended to be, a money making business.

We should not be able to carry on the work at all had we not enthusiastic volunteers. While by the utmost care, our manager is making the shop pay its expenses now, promotive work, exhibitions, prizes, teaching, and many branches of our work must be supported in some other way. Members' subscriptions have long ceased to cover even printing and stationery.

During a recent trip through the North west, we found not only the riches of soil, water and forest, but also the wealth of an extraordinary amount of skill and knowledge brought to us in Canada by men and women from many countries. In addition to the wonderful basketwork of the west coast Indians, who have raised this industry to an art, there are the various characteristic peasant crafts and the work of the trained educated craftsman, such as Chinese jewelry in B.C. This wealth is hardly appreciated at its true value. The intuitive sense of colour and knack of hand in the Indian and peasant, the growth of centuries, will soon die out or become degraded if not encouraged properly. The younger generation, both through ignorance and a natural tendency to over-estimate the new and undervalue the old, are not likely to continue their parents' crafts and are inclined to look upon them with contempt as evidences of a less prosperous condition of life. It may be noted that their taste in these new forms of work is not so pleasing, possibly because they have not the opportunity of seeing the best.

Without encouragement the right hand of the craftsman will soon forget its cunning, or he will go further south and we will be the poorer for the loss of skill needed in the near future.

The Guild realizes, therefore, even more fully the work it can so inadequately accomplish. It urges that all means be taken to maintain a right view of every kind of manual labor and to ensure for knowledge and excellence in craftsmanship that honor and respect willingly accorded to other forms of knowledge.

Much could be done to keep a right point of view before the child even in school life, and afterwards by means of special classes and schools, the characteristic

industries and crafts of each locality could be maintained with benefit to the individual, the community and the country at large.

A well balanced education would be achieved and an efficient population result.

The work extends from Prince Edward Island to Vancouver. Many settlers are abandoning their crafts for want of a market, and the Guild furnishes this. Nearly \$25,000 was distributed between 1905 and 1911.

The Guild forms a bond of union for the many races composing Canada's population.

SECTION 3: AS TO DOMESTIC SERVICE.

(By MRS. RADFORD.)

We believe that there are about 8000 maid-servants in Montreal. The returns of the immigration agencies show that of the 3364 women and girls, who arrived in Montreal during the past year, 1001 remained in the city, the majority entering domestic service.

The replies given to questions sent by this committee to a large number of families were almost unanimous in regard to the following points:—

1. There is great difficulty in securing competent domestics, especially cooks.
2. Employers prefer experienced, well-trained maids, although a few mistresses are both able and willing to train their own servants.
3. The wages offered vary from \$8.00 to \$10.00 per month for an untrained girl to \$40.00 per month for a first-class cook.
4. Indefinite hours of service and false ideas in regard to the status of domestics, and the mistresses' own lack of training in housewifery probably account for the fact that there is an insufficient supply of efficient maids of all kinds.
5. Employers are usually willing to allow domestic servants time either in the afternoons or evenings to attend classes in domestic science.
6. The demand for such classes is great, not only on the part of those born in Canada, but on that of immigrants. Although many of the latter have certificates from European institutions, they should have and are anxious to secure further training.

Courses in Domestic Science in the day schools and in evening classes are being provided by the Protestant Board of School Commissioners. At the Commercial and Technical High School, there are now eight classes in cookery, five in sewing and two in dressmaking. But more extended opportunities are being demanded by girls who wish to become expert in the various branches of housework, and in the care, feeding and training of young children.

So, too, courses which would rank with other departments in a higher technical college or in a faculty of Applied Science in a good University are necessary in order to train the teachers of housewifery in schools, settlement workers and the housekeepers of large institutions. The demand for the services of such women seems in all places greater than the supply.

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The further provision of continuation schools or classes from which servants might obtain diplomas, certifying to their efficiency in various branches of housework, and the training of mistresses not only in household arts but in the underlying sciences, will do much to improve conditions. But as Miss Mabel Atkinson of King's College, London, has pointed out, housekeeping will remain a backward industry until there has been worked out a method of organization which will secure co-operation without detracting from the privacy of the house.

SECTION 4: REPORT OF SUB-COMMITTEE ON EDUCATION.

(By MISS HUNTER, Principal of the Girls High School, and MISS HIBBARD, Supervisor of Primary Work in Public Schools.)

The Superintendent of the Protestant Board of School Commissioners reports that in the year 1909-1910, 7218 girls were enrolled in the Commissioners' schools. That very few out of this number completed the public school course is shown in the Commissioners' report for 1909-1910, where it is stated that less than fifty per cent of the Fourth Year pupils finish the Public School course.

There is little doubt that these children, leaving school at such an early age and with so meagre an education, generally enter some occupation which is unsuitable and physically, socially and mentally retrograding.

In 1909-1910 only 52 out of the 266 pupils who entered High School remained to finish the course of four years.

From the Commercial Department of the Commissioners' Commercial and Technical High School about 100 girls leave usually to become wage-earners, and from the Technical Department about 40 girls leave for the same purpose. These girls enter offices as stenographers, typewriters and general office assistants, or business houses as book-keepers, assistant book-keepers, saleswomen and cashiers, having been in attendance at the Commercial Department; those leaving the Technical Department generally become teachers, while a small number become dressmakers' assistants and others go into millinery. Should these girls remain for the full four years' course, they might become skilled workers. Those girls leaving generally supplement the training they have received with a short course in a business college, especially those not remaining for the full four years' course, but, while the girls are taught sewing, and the facilities and equipment are adequate in the Commercial and Technical High School, the time—a few hours each week—cannot prepare them for wage-earning. Should these girls have one, two or three years' work with lessons in sewing every day, they might then become expert dressmakers and milliners; this not being the case, it is impossible for girls to pass from the Commercial and Technical High Schools into commercial and technical industries as skilled workers.

The minimum salary earned by these girls leaving the Commercial and Technical High Schools is \$4.50 per week, the average wage \$5.50 per week, and the maximum \$8.00 to \$10.00.

There is at present in Montreal little opportunity offered to young girls who have completed the public school course to secure training that will enable them to enter industries capable of becoming skilled workers, if not as skilled workers. A trade school offering opportunities in training in Millinery and Dressmaking, Designing, Book-keeping, Stenography, Chemistry, Electricity, etc., should be within reach of those wanting it.

Entrance to such a Trade School should follow the full Public School course, pupils being admitted only after the completion of the Public School course or its equivalent, which would be ascertained by an entrance examination. To put any of these specialized subjects into the Public School course would be a mistake, as the early years of a child's life from a psychological and sociological standpoint, are best spent in acquiring the foundation studies necessary to an intelligent, economic and happy pursuit of any trade or industry.

At present teachers for industrial and technical classes have to be obtained from other cities or centres, and it is desirable that a training school for such teachers should be established within our own Province.

The number of teachers employed in the Commissioner's Schools is 455. Of this number 408 are women, 22 of whom are University graduates.

The salaries for teachers are as follows: Minimum salaries for men \$600, for women \$430; the maximum salary for men is \$2,000, for women \$925.

The proportion between the salaries received by men and those received by women is thus: women receive $\frac{1}{2}$ in the Public Schools of the amount men receive, while in the High Schools women receive one-half of the amount men receive.

SECTION 5: REPORT OF A SUB-COMMITTEE OF NURSES.

(By MISS GRANT and Representatives of the three Societies of Nurses.)

There are about 351 trained nurses carrying on their profession in Montreal; of these 35 have maternity training only and 85 are from Hospitals in other cities and towns.

Three years is the general course; it has for the last six or seven years included maternity training and is considered adequate.

Applicants generally enter the hospitals directly from their homes; a few have been teachers or stenographers. All must possess a good grammar school education or its equivalent, preference being given to those who have had a course in Domestic Science.

The addition of Elementary Chemistry, Physiology and Hygiene to school courses would be helpful.

Only women from 23 to 35 years of age are admitted.

The average income of a trained nurse is \$600 per year. Ten to twelve years is the average length of time during which a nurse actively engaged in private nursing can expect to continue her work.

There are many untrained nurses in Montreal. Of these, some are graduates of small hospitals, others have failed to take the full hospital course, and many have

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only home experience. If the fact that they are not trained were fully recognized, they would not interfere to any great extent with the trained nurses. Provincial registration for every graduate of a recognized training school, entitling her to the use of the letters R. N. (Registered Nurse) after her name would probably diminish grievances which arise from the competition of untrained or partially trained women with trained and would give the graduate nurse a better standing in the community.

SECTION 6: EDUCATIONAL AND EMPLOYMENT BUREAUX FOR YOUNG WORKERS.

(By MISS ETHEL HURLBATT, Warden of Royal Victoria College.)

In England and Scotland the local authorities are empowered to carry on Bureaux for helping boys and girls to choose suitable vocations. (See Mrs. Ogilvy Gordon's book). Some knowledge of the needs of the workshop must influence the schools, whether primary, continuation, industrial or technical, and they should prepare workers. Industrial and technical education cannot be within the reach of the majority of workers unless employers co-operate.

It is desirable to direct children to occupations for which they are most suited and in which there is a demand for their labor, and to prepare them to enter these employments; to protect them from the injury resulting from unfavorable conditions of unskilled labor, and to prevent their drifting into casual employment. The Bureaux are under the management of the Education Authority, co-operating with the City Council, Board of Trade, Trade Council, etc. The employer and Educational Authority are mutually benefited by the interchange of information and understanding; the children are guided into suitable employments, and kept in sight until ready to start work for which they are adapted.

Montreal is particularly liable to suffer from the evil of casual employment, owing to lack of compulsory education. The raising of the school age to 14, whilst useful as factory legislation, still leaves children the victims of the necessity or cupidity of parents, and liable to enter the ranks of the unemployed and unemployable in later life.

The whole value of these Bureaux consists in their intimate connection with the school.

SECTION 7: GIRLS' CLUBS IN MONTREAL.

(By MISS ETHEL HURLBATT, Warden of Royal Victoria College.)

Clubs may have an important influence on girls between 14 and 17 who are under no formal educational influence; this has been shown in England. Opportunities for further education do not appeal to those who pass out of the primary school, still less to those who have not even had that much education. 50% of the children in Montreal leave before the end of the school course. Working girls are too tired for ordinary night school, but carefully managed clubs might in the

end afford more effective stimulus. Other clubs teach recreative handicrafts, such as plaiting, needlework, paper-flower making, leading to more advanced work in dressmaking, millinery, cookery and laundry work. Singing and physical culture are also popular subjects, and have a good influence, by bringing girls under discipline. The clubs attract the girls by their social, moral and recreative influence, and the classes need not be of the rigorous type of the ordinary evening school, while they can and do gradually interest the girls in education. In Boston the club has a beneficial effect upon the girls' condition by pledging them not to accept less than \$5 a week.

SECTION 8: AS TO VOCATIONAL SCHOOLS.

(By Miss HUNTER, Principal of the Girls' High School.)

Girls have not sufficient opportunity for getting vocational training in Montreal. Two things should be aimed at—(1) training the powers of judgment; (2) habits of accuracy. In Boston the Girls' Club gives them training for trades from 14 to 18, and helps them morally and physically under factory conditions, and when they go into the factories, they have their power of judgment strengthened. We do some work in the 5th and 6th year, but it does not keep them in school; 50% leave after 4th year, at 10 or 12; even at 14 a girl is not equipped to make a success of her life. Parents and teachers should co-operate in helping girls to choose an occupation—the State should provide for the 50% waste who leave the public school before completing the course. The girls hasten themselves out of school; they are eager to begin earning; they should be taught to see how bad it is for them to leave school so soon, but the schools also should manage to interest them. Trade schools are needed, and should be managed by those knowing factory conditions as well as more academic people. The Government should help; it is a Federal duty and opportunity.

SECTION 9: THE UNIVERSITY SETTLEMENT OF MONTREAL.

(By the Alumnae Society of McGill University and the Settlement Workers.)

The boys and girls in our clubs show lamentably the lack of early school training—a lack which has unfitted them to receive later the benefits of technical and special training. There are cases of Canadian girls of 16 who have received no education, being unable to read or write—who now eagerly grasp the belated opportunity of evening classes.

Girls of 14 to 16, compulsory wage-earners receiving wages averaging \$4.00 weekly, would gladly take advantage of business college classes, were they fitted by early education to receive such training. Under present circumstances, they cannot hope for reasonable advancement. The same may be said of the boys, especially in regard to preparation for vocational work.

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It would be futile to stand for the abolition of child labor if this means turning the children into the streets. It is pitiable to see children of school age wandering aimlessly around the streets in the absence, often, of both parents, who are at work. Most heartily do we believe in and would endorse any movement towards compulsory education.

All settlement experience thus far has shown us that which has been so tersely expressed by Dr. Eliot of Harvard. "If we are hoping to reform mankind, we must begin with the children, in the home, the school, the street and the playground."

These children frequently drift into our kindergarten with disorganizing effect upon the little children—are they to be turned away? Is the responsibility with the parents or with the city?

CHAPTER XLII: LA FEDERATION NATIONALE DE SAINT JEAN-BAPTISTE.

This French-Canadian Roman Catholic Women's Society works in 3 departments, viz:—Charitable, Social and Educational. This work is done by Special Committees and a Permanent Committee, composed generally of members of the Federation, but outsiders may be included for special duties. Conferences are held, at which papers are read on various aspects of women's work and interests, such as careers and professions for women, measures of assisting their development from the hygienic, moral and social point of view, the education of women and children and kindred subjects.

WOMEN AS INDUSTRIAL WORKERS.

At the 1909 conference a paper was read on the proportion contributed by women of the industrial production of the country (by Mlle. M. Auclair, President of Manufacturing Employees) of which the following is a summary:—

Women's work is a question touching not only the individual interests of the worker, but those of the entire nation. The education of the young, the conservation of the race, and the moral and physical welfare of the people depend on the organization of women's work in the industries of the country. Woman has always worked—as witness the Greek goddesses and heroines, who are always represented as sewing, weaving, etc. For many centuries women's work appears as a specially domestic industry, and in the middle ages much beautiful work was produced. The workroom was an integral part of every nobleman's house, this being the forerunner of the factory of our own day. A German writer says the industrial position of women was spoiled by the corporations, which left them nothing but the arts of the home, and that ever since corporations came into existence, women have been more or less excluded from industry. This opinion, however, is not supported by facts, for corporations have a large share in the employment of women. In 1901, out of a total of 313,344 people engaged in wage-earning occupations in Canada, 61,220 were women, viz 27% of the number of men in wage-earning work and 14% of the number of men in professions. In 1905 there were 68,001 women in wage-earning occupations in the whole of Canada, as against 288,033 men; whilst in the professions there were 4,951 as against 31,545 men. These figures apply to manufacturing industries only, and do not include women in business, shops, teachers or domestics. The proportion of salaried women as against that of men is a little under one-seventh, whilst the proportion of wage-earning women is rather above one-quarter. Out of the 15,796 manufacturing establishments referred to, 650 employed men only; thus, deducting the products of these from the total manufacturing products of Canada, we get \$661,750,600 as the product of factories employing both men and

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women, which divided by 4, gives \$165,437,650 as the product of women's work, out of a total of \$718,352,603 produced in the country.

DOMESTIC SERVANTS

A Commission should be appointed, giving interests to all who are already working at the problem. Research should be made as to how immigrants could be taught here to be domestic servants. The chief difficulty lies in the fact that the girls depreciate service and find no dignity in it, and the mistresses give too much discredit to the occupation. A kind of self-respect takes them away from the career, and a change of name to "aide-ménagère" helps to raise the dignity of the position.

NURSES.

The President of the St. Gustin Hospital states that a 3 years' course is given there, as well as in the General Hospital and the Hotel Dieu, and a 1 year maternity course at St. Gustin. The supply of nurses does not meet the demand.

St. Gustin's has a dispensary and distributes modified milk. The City Council gave \$1,500 to start the movement, and \$1,000 the following year, but the work is expensive and the demand great. The Government should help in this work, as it reduces infant mortality and improves the health of all children. Visitors are appointed to see that instructions are followed.

LES ECOLES MENAGERES PROVINCIALES.

MME BEIQUE, Montreal, writes:

This school of Domestic Science was established by the ladies' section of the St. Jean Baptiste Society; a committee of gentlemen agreed to see to the finances of the institution.

The aim was to give practical lessons on housekeeping in all its branches, and also to have a normal course of domestic science, so that teachers could be trained for the schools of the Province. Hence the name: Provincial School of Domestic Science.

Two young ladies were sent by the Committee to study in Europe. Miss Anctil graduated in Paris, France, and Fribourg, Switzerland. Miss Lajoie graduated in Fribourg, Switzerland. They afterwards visited other schools in France, Switzerland, Belgium and England, to study the different systems followed there, and report to the Committee.

A program was decided upon with the idea that a woman, whether she is rich or poor, ought to know everything about housekeeping, the care and rearing of children, and a good deal about sick nursing. With this end in view, the teachers gave day and evening lessons in cooking, sewing and cutting, laundry work and so on; and the public were admitted to the lessons given by nine doctors to the pupils of the normal course, on hygiene, care of children, care of the sick and injured, practical family medicine. Cooking lessons have been given to the young girls of different societies affiliated to the Federation St. Jean Baptiste.

A course of cooking for invalids will be given to the nurses of the Hotel Dieu Hospital, and probably later on to the nurses of the Notre Dame Hospital.

One of the teachers gave weekly lessons last year and this year to the pupils of a convent at Mile-End; the same room is used for a public evening lesson.

The Committee, besides the annual normal course for teachers, will try to establish the system called *système rapide* in France and Belgium, for the benefit of teachers having their diplomas in other branches of learning. A course of six weeks is given during the summer vacation; weekly lessons during the year, and a rehearsal during the vacation following, complete the course. The diplomas are granted after an examination by competent judges. During the summer of 1910 a course was thus given to eight teachers. This system would be useful to many teachers, if Domestic Science is added to the program in the primary schools.

The Committee beg to recommend that no teaching in Domestic Science should be given by incompetent persons. They also think that they are justified in thinking that this branch of learning is one of the best mediums of education against the dangers of alcoholism, tuberculosis and infantile mortality.

CHAPTER XLIII: SUMMARY OF OTHER TESTIMONY AS TO WOMEN'S WORK AT MONTREAL.

SECTION 1: AS TO DOMESTIC SCIENCE AND ART.

The St. Jean Baptiste Federation (French) have been trying to establish Domestic Science in the schools since 1906, and have sent young women to Europe to study for 2 years. This Society gives a Normal course which is more advanced than the general public course. Their classes prepare for technical courses of various kinds, e.g. lessons on hygiene are useful for future nurses, washing and ironing for girls who intend to become laundresses, sewing and cutting out for dressmakers and seamstresses, etc.

Domestic Science should be taught in all elementary schools, and would be for the benefit of the country. The most important thing is to train teachers so that all children may get it. Vacation courses are recommended for this. It is important that teachers of Domestic Science should have a high idea of it, because women should have a high idea of the work which is to be their life-work. Girls should be taught how to buy as well as how to prepare food. The Federation is trying to train mothers and housekeepers, but the school for mothers is very poorly attended and not appreciated. Instruction should be begun when the girls are still at school.

Domestic Science is taught in the Technical School. Many nurses need it; 'they cannot cook an egg'. The girls like the work and take great interest in it. It is important to have one large centre, and small departments in all the schools.

Every teacher in all the schools should have special teaching in Domestic Science, and teachers in country schools should be able to teach hygiene, etc. If they had it in the public schools, very little training would be required in the Normal. Sewing should be taught by a different teacher to the one for cooking; 15 lessons in cooking and 10 to 15 in sewing in the first year is enough.

Miss Anctil was 1 year in Switzerland training for a teacher's course. She said that they also had training for domestic servants there. Previously she took a preparatory course in France for 6 months, and then studied for an examination. Domestic Science is compulsory for all girls and all teachers in Switzerland; it is not compulsory in France, but the Government took it up and have courses for teachers also. It has been compulsory in Switzerland for 15 or 20 years, and the results on the children have been most satisfactory; they take their leaving school diploma at 13. Domestic Science teaches them to reflect and think for themselves, and thus helps their general development.

Two Ladies Superior stated that Domestic Science had greatly helped girls in their Convent, and seemed to develop their intelligence, by making them reflect.

The Technical School has a very good equipment for Domestic Science; but care should be taken to have equipment such as girls are likely to have to work with, and not too elaborate.

Girls should have compulsory sewing and cutting in the Public School. Mme. Gagnon stated that the Dressmaking and Hat-making School has 534 pupils; its chief aim is to fit factory girls for better positions. The classes are chiefly held in the evening, but some pupils come in the day, there being 190 in the day and 185 at night, exclusive of the hat-making class. Classes are held 3 nights a week, 2 for sewing and 1 for hat-making. Some pupils take only one course, others take both. They learn to design patterns and cut material by them. They have a special drawing course to make the ornaments by linear drawing, so that they can adapt sizes; they learn to draw, design, cut, fit and sew. There are 15 pupils to one teacher, and Mme. Gagnon herself signs all drawings before they are cut. Girls find good positions; some in families at \$2 a day and meals; others in general stores in the country, earning \$12 a week and board, and some open hat-shops for themselves and do well. The average wages for hat-making in stores are \$7 a week, but girls with taste can earn more. This school cannot accommodate all applicants. It has 7 courses in all; 2 dressmaking and 2 hat-making day courses, and 3 evening courses. Pupils come from all parts of Eastern Canada.

Miss Reid, head of the subscription department of the "Witness" office, is a graduate of McGill, and has found University education of great advantage to her. She would have liked more Domestic Science, and favors its introduction into the public schools, as it trains the judgment. What contributes most to efficiency is ability to distinguish the important from the unimportant, and Domestic Science teaches the exercise of judgment, close observation, and doing things without waste, all of which are important factors in education. Girls should be taught the duties and responsibilities of life, and made to feel that thoroughness and dependability are qualities which have a wage-earning value as well as a moral one; they can only learn the value of responsibility by taking it. This may be done in actual work after leaving school. One year in an office may be worth a year in college, but college training enables one to make the best use of the office training. Girls should stay at school longer; the short business course is very detrimental, as the girls are inadequately prepared and enter business before they are fitted for it.

Miss Hibbard, Supervisor of Primary Work under the Protestant Board, considers handwork (modelling, etc.) a fundamental subject in the public school. Other subjects can be taught in connection with it, and children make more progress in them, e.g. in reading. Manual Training enlarges their vocabulary.

SECTION 2: AS TO INDUSTRIAL OCCUPATIONS.

A witness from the Shoe Company said that operatives need industrial training to teach them the reasons for things, so that they would work better and need less supervision. At present foremen and superintendents have to be imported from the United States, but Canadians would be just as capable if they had the training.

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This Company would be willing to adopt the half-time system to get apprentices to attend school. "There is nothing automatic in the shoe business; there has got to be brain combined with machinery." Co-operation between employers and instructors to avoid duplication of machinery is desirable.

Mlle Bouthillier, President of the Business Women's Association, wants opportunities provided for Technical Education. Girls can acquire the knowledge, but not the experience, before going into offices. There is a need for "formation offices." Evening schools afford great advantages, but not the experience, and without experience girls cannot get positions, except by taking low wages or none at all. As a rule they are well prepared except for the technical part of the work. Girls should be indentured, so as to ensure their learning their work thoroughly.

Miss Mary Desmond, of the Ames-Holden Shoe Company, said that girls go in at 15. Many of them are very uneducated, but get on just as well. They do one thing over and over until they acquire skill by practice. They work sometimes till 2 or 5 o'clock on Saturdays, and have no time to go to classes except in the evening.

Miss Marie Lomax, saleslady in John Murphy, Ltd., said she had no special training. Girls get short courses in selling in the shop. They start at \$7 and may rise to \$18 and \$20. Girls help one another, and the firm is always willing to teach those who have aptitude. The hours are 8 to 5.30; Saturdays close at 1. All holidays are given, and overtime is paid for. The firm thinks that if the women are well treated, they will be better saleswomen.