Ontario Department of Education

BULLETIN NO. 2

1912

INDUSTRIAL, TECHNICAL, AND ART EDUCATION

Synopsis of The Industrial Education Act and of The Adolescent School Attendance Act

Recommendations and Amended Regulations for the Establishment, Organization, and Maintenance of Day and Evening Schools

The Record for 1912 in Industrial, Technical, and Art Education

PRINTED BY ORDER OF

THE LEGISLATIVE ASSEMBLY OF ONTARIO

TORONTO:

Printed and Published by L. K. CAMERON, Printer to the King's Most Excellent Majesty

1913.

Proposed Industrial, Technical, and Art Schools, Toronto.

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PREFATORY NOTE

Part I of this Bulletin contains recommendations and the Departmental Regulations for industrial and technical education, now amended in accordance with the experience gained since their first publication in "Industrial Schools," Circular No. 27, 1911. The Regulations for art and agriculture are contained in separate Circulars. The Regulations for industrial and technical schools, however, are still as elastic as possible, in order to allow this branch of education to develop in accordance with the varied necessities of different centres. This Bulletin contains also a synopsis of *The Industrial Education Act* and *The Adolescent School Attendance Act.* The adoption of both of these Acts is still optional with each locality; but, as is shown in this Bulletin, the former has been put into operation in a very considerable number of the manufacturing centres; and, although passed only last Session, the latter has already been adopted in London, and comes into effect in January, 1913. The provisions of *The Adolescent School Attendance Act* are so far reaching that it will no doubt take some years before it is as generally adopted in Ontario as it is in Germany and some other continental countries; but, if this Province is to hold as important a commercial status in manufactures as it does in agriculture, the general adoption of the Act cannot be long delayed.

The correspondence of the Department of Education during the past two years has shown that more detailed information and guidance are required by school boards and staffs than can be conveyed in Departmental Regulations and formal recommendations. Accordingly, besides the record for 1912 of the advance in industrial and technical education, Part II of this Bulletin contains the complete reports for the same year of the different classes of schools that are at present in operation in Ontario. These reports deal with the systems of organization and management, the courses of study and their organization, the names and qualifications of the staffs and of the Advisory Boards, and, in addition, they contain accounts of the steps taken to secure the establishment of the schools and to give publicity to their advantages. Such details, experience has shown, should prove suggestive to those localities that contemplate the establishment of such schools or desire to improve the condition of those which they have already established. In order also to make the Bulletin more useful, it has been plentifully illustrated with suggestive photo-engravings of school buildings and class-rooms.

In the appendix to Part I will be found important resolutions passed by manufacturers and labour associations in both the United States and Canada since the publication of the report on *Education for Industrial Purposes,* made by Dr. Seath, Superintendent of Education. At the present stage of the solution of our problem of providing for industrial and technical education, these resolutions are valuable as showing the present views of the two classes that are immediately concerned.

In the appendix to Part II will also be found an account of the organization, management, and resources of the Technical Schools at Montreal and Quebec, the former of which Dr. Seath visited last October. This account cannot but prove interesting and suggestive to Ontario at the present stage in the solution of its problem of industrial and technical education.

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PART I

Synopsis of The Industrial Education Act of 1911 and of The Adolescent School Attendance Act of 1912

Recommendations and Amended Regulations for the Establishment, Management, and Maintenance of Day and Evening Industrial, Technical, and Art Schools

INDUSTRIAL, TECHNICAL, AND ART SCHOOLS

SYNOPSIS OF THE INDUSTRIAL EDUCATION ACT OF 1911

Definition of Names

In *The Industrial Education Act* and the Regulations of the Department of Education, the name Industrial is applied to both day and evening schools and classes for the preparation of workmen and workwomen; and the name, Technical, to those for the preparation of foremen and forewomen and the holders of minor directive positions in the trades. Manual Training and Household Science, hitherto designated Technical, are now classed as cultural and practical subjects of the High and Public School courses of study whether they are taken up in day or evening classes. While introductory to Industrial and Technical courses, they are, however, neither Industrial nor Technical themselves. The foregoing distinctions should be borne in mind.

Classes of Schools

At the session of the Legislature in 1911, *The Industrial Education Act* replaced all the preceding Acts which dealt with elementary Industrial, Technical, and Art education; and this Act, it is important to remember, is the only one under which Industrial, Technical, and Art Schools can now be established and maintained at the public expense. Section 4 of the Act provides for the following classes of schools, which a High School Board or a Board of Education of any city, town, or village, or an Urban Continuation School Board may establish with the Minister's approval:

I. DAY SCHOOLS

(1) General Industrial Schools for instruction in such subjects as may form a basal preparation (*a*) for the trades, and (*b*) for similar manual occupations which are not classed as trades; the courses, including work shop practice, with correlated drawing, English, mathematics, and science, and continuing the essential subjects of a good general education.

Such schools, elsewhere known also as Preparatory Trade Schools and Prevocational Schools, have been established at Brantford, Hamilton, London, and Toronto.

(2) Special Industrial Schools, providing for instruction in the theoretical and practical work of particular trades, and when deemed desirable, in the essential subjects of a good general education.

Such schools, elsewhere known also as Trade Schools, have been established at Haileybury, Sudbury, and Toronto.

(3) Technical High Schools and departments of High Schools for the training of duly admitted High School pupils for minor directive positions in industrial establishments, and for admission to the higher scientific schools.

Such schools have been established at Haileybury, Hamilton, Sault Ste. Marie, Sudbury, and Toronto.

(4) Co-operative Industrial Classes in which and under such conditions as may be agreed upon between the Board and the employer: (*a*) apprentices, whether indentured or not, employed in the workshops, may receive in the day schools instruction bearing upon their trades; and (*b*) pupils attending the day schools may receive practical instruction in the workshops. The former of these may be known as Factory Co-operative, and the latter as School Co-operative Industrial Classes.

Such classes have been established at Sault Ste. Marie in connection with the technical classes of the Collegiate Institute, and at London in connection with the Day Industrial School. The former are Factory, and the latter School Co-operative Classes.

(5) Schools for instruction in the Fine and Applied Arts.

Such schools or departments have been established at Hamilton, London, and Toronto.

The Legislature also established at its last session the Ontario College of Art, which, though under the direct management of a Council, prepares teachers of Art for the High and Public Schools in the Province, in addition to its other work in the Fine and Applied Arts. Although only a few months in operation, it is well attended and provides comprehensive courses. In 1912, it received a legislative grant of $3,000, and is provided by the Department of Education with free accommodations, heating, and caretaking. It receives also $1,000 in lieu of fees for those teachers, approved by the Minister, who attend its Spring and Summer classes.

II. EVENING SCHOOLS

(6) Industrial, Technical, and Art Schools, in which workmen and workwomen employed during the day may receive in the evening theoretical and practical instruction in their trades.

Such classes have been established at Berlin, Brockville, Collingwood, Galt, Guelph, Hamilton, London, Stratford, St. Thomas, and Toronto.

Advisory Industrial Boards were also recently appointed at Cobourg, Oshawa, and Ottawa. Under them, evening classes will begin as soon as practicable.

At the recent municipal elections in Windsor, the ratepayers voted by a substantial majority in favour of establishing Technical Classes in the Collegiate Institute.

Advisory Industrial Committee

Under this Act also the control of these schools is vested in an Advisory Industrial Committee, composed of twelve members; six members of the Board, and six others, not members of the Board, three of whom are employers and three employees, in connection with the manufacturing and other industries carried on in the locality; of such employees, at least one should be an operative. It is reasonably assumed that these representatives of employers and employees have an expert knowledge of industrial conditions. The powers of the committee are, however, exercised, subject in all cases to the approval of the Board, and, in certain cases, to the joint approval of the Board and the Minister.

The cultural Manual Training and Household Science classes, whether day or evening are still under the sole control of the School Board.

Constituted as they are on a plan similar to that of the Advisory Committees on the European Continent, our Advisory Industrial Committees have turned out to be eminently suited for their purpose. Since their establishment in 1911, more

progress has been made in industrial and technical education in our schools than in all the years that preceded, and recent correspondence with the Department gives good ground for expecting that during the year 1913, a large number of other centres will provide evening classes, at least.

Departmental Direction

Dr. Merchant has been appointed Director of Technical and Industrial Education, and after next midsummer he will visit from time to time the industrial centres of the Province and assist School Boards in establishing and operating their local industrial and technical systems. In the meantime, Inspector Leake has charge of the Industrial Classes.

Applications to the Department for assistance and guidance in the establishment of industrial and technical classes will receive prompt and sympathetic attention.

Admission Qualifications

Investigation of the conditions in Ontario has shown conclusively that at present extremely few Ontario workmen and workwomen have ever attended a High School. Most have entered the trades from Form IV of the Public Schools, having only partly completed the course; and some, indeed, enter from Form III, having reached fourteen, the age of exemption. It is, however, fair to assume that many of such pupils would attend longer if courses were provided leading to the trades, and, especially, courses leading to more lucrative employment than they have hitherto been able to secure. In order, accordingly, that the nature of the provision may be understood by the pupils themselves, it would be well for the Public and Separate School Boards to authorize the Advisory Committee and the Principal of the Industrial or Technical School to bring the subject before the Fourth Forms of the locality.

Section 5 of the Act provides as follows:

(1) Subject to the Regulations and with the approval of the Advisory Industrial Committee, pupils may be admitted to a Day Special or General or Co-operative Industrial School by the Principal thereof from the Fourth Form of the Public or the Separate School, upon the recommendation of the Principal of such school.

(2) Pupils admitted to a Technical School or Department as defined above, shall have passed the High School Entrance examination.

(3) For the Industrial, Technical, and Art Evening Schools, no educational qualification is prescribed for admission. Workmen or workwomen employed during the day may be admitted, but no one should be allowed to attend classes for the work of which they are not prepared.

ESTABLISHMENT OF SCHOOLS

In establishing Industrial, Technical, and Art Schools and Classes the Advisory Committee is usually confronted with three main difficulties:

1. Indifference on the part of those for whose benefit the schools and classes are intended. Notwithstanding the constitution of the Advisory Committee it is important that a general canvass and study be made of the local industrial situation. The Advisory Committee should, accordingly, confer with other employers and employees concerning the organization of the school. The sympathetic co-

operation of all ranks of labour is essential to success, but on the employer in particular rests the chief responsibility. In other countries, where a compulsory attendance law is not in operation, he offers his employees inducements of various kinds to attend—a reduction, for example, of the hours of day labour, and, especially, increased wages and more rapid promotion. The experience of the last couple of years has shown that a similar course will be necessary in Ontario.

2. The lack of competent teachers. Each teacher must possess suitable expert knowledge of his subject. For the academic subjects the ordinary certificated teacher will suit, provided he has duly familiarized himself with industrial requirements; but, for the shop-work, foremen or forewomen, and for the theoretical and practical technical work, teachers specially trained at industrial or technical colleges are indispensable. In Montreal, as will appear later in this Bulletin, the shop instructors were appointed from the ranks of the mechanics after a competitive examination, and, as has been shown in the Superintendent's report on *Education for Industrial Purposes,* this system of selection has been carried on for years in Paris, France. Not only will such teachers give, as, indeed, only they can give, the necessary practical turn to the work, but they will command the confidence and sympathy of the students.

Special difficulty will, however, be experienced in securing teachers for the elementary courses of the General Industrial Schools. To maintain the necessary correlation amongst the subjects, the teacher, when there is only one, should be conversant with the whole course, and where there are more than one, each should possess this qualification; for although in the organization he may be called upon to teach only part, to teach this part well he must know the whole. Few such teachers are as yet available in Ontario; but, as soon as practicable, courses of instruction will be provided by the Department. For the Day Industrial School, the Manual Training and the Household Science teacher who holds at least a Second Class Certificate would suit after some training specially adapted to the school course of study.

While the Advisory Committee will take a general oversight of the organization of the classes, it is important that they should be under the charge of a principal teacher who possesses both executive ability and general mechanical knowledge. Such principal should have full control of the industrial courses, subject to the Advisory Committee.

3. The difficulty of constructing courses of study suitable to the requirements of the locality.

The needs of the different localities vary so much that any settlement of the details of the courses must be made by the local authorities. The Industrial Education Act, accordingly, leaves the initiatory steps to the Advisory Committee. After the subjects have been selected, the next step should be the submission of a report by the teacher in charge to the Advisory Committee upon the details, equipment, etc., followed by due consideration by the Committee and the Board, before submission to the Minister for his approval. The first year must, however, be more or less one of experiment, and the organization should be modified from time to time in accordance with the experience of those concerned. For the same reason, the Minister will be prepared to approve of any modification of the regulations that, in his judgment, local conditions may justify.

For suggestions in constructing the courses recognized by *The Industrial Education Act,* all concerned should refer to the various systems and courses of study which for this purpose were included in the Superintendent's report on

Education for Industrial Purposes, published in 1911, and to the General Industrial courses detailed further on in this Bulletin, and especially to the Technical and the Industrial courses, also included in this Bulletin, which are now in successful operation in different centres in the province.

As soon as an industrial, technical, or art course is comprehensive enough, the Minister will be prepared to co-operate with the local authorities in awarding diplomas. A specimen copy of this diploma will be sent the Principal on application to the Deputy Minister of Education.

MUNICIPAL GRANTS AND DISTRIBUTION OF LEGISLATIVE GRANTS

For Day and Evening schools, Section 11 of *The Industrial Education Act* provides that the cost of establishment and the cost of maintenance, in addition to the Legislative grants, shall be defrayed as is provided in sections 33-34 of the High Schools Act.

For some years the Legislature has made special grants of $5,000 each to a few of the High Schools for the promotion of industrial, technical, and art education, and, under the Manual Training and Household Science Regulations, a sum was distributed annually amongst a few High Schools which were specially organized and equipped for giving instruction in the theory and practice of the Mechanical and Industrial Arts and Sciences, whether such instruction was given in day or evening classes. In 1911 the Legislature took another step in advance; it voted $20,000 for Evening Industrial Classes, and repeated the vote in 1912.

As the establishment of Day Industrial, Technical, and Art Schools will entail a large expenditure and as there is ground for the expectation, that, as it has already done munificently in the case of agriculture, the Dominion Government will recognize the claims of the industries by giving grants to the provinces for industrial and technical education, the Ontario Government has delayed the settlement of a comprehensive scheme until the amount and terms of such grants are known. At its last session, however, the Ontario Legislature voted $25,000, as an initial grant, for the establishment and maintenance of Day Schools, with the result that, although only a few months have since elapsed, a number of efficient schools are already in successful operation, and a considerable number of others are at present in contemplation.

When the accommodations, the equipment, the text-books, the qualifications of the staff, and the courses of study are satisfactory to the Minister of Education, and when the Board is not in receipt of a special Legislative grant for Industrial, Technical, or Art Schools, the Legislative grant for Evening and Day Industrial, Technical, and Art Schools shall be distributed under Section 6 (*l*) of *The Department of Education Act,* in accordance with the following scheme. If, however, the amount voted by the Legislature is insufficient to pay in full the apportionments under the scheme, or if there is a balance left over after payment in full, the Minister may make a *pro rata* reduction or increase.

I. EVENING SCHOOLS

(1) A grant on salaries, as follows: In cities with populations of 150,000 and over, one third; in other cities, one half; in towns, two thirds; and in villages, five sixths, to a maximum of $3,000 in each case.

(2) An initial grant of 40 per cent. on new equipment, specially provided for Evening Industrial, Technical, and Art Schools, to a maximum of $1,000, and of 20 per cent. thereafter on the same equipment.

II. DAY SCHOOLS

(1) A fixed grant of $250 for each Form established.

(2) A grant on salaries, to a maximum of $5,000, proportioned as follows on the total salaries of the staff:

In cities with a population of 150,000 and over, one third; in other cities, one half; in towns, two thirds; and in villages, five sixths.

(3) An initial grant of 40 per cent. on new equipment specially provided for Day Industrial, Technical, and Art Schools, to a maximum of $2,000 and of 20 per cent. thereafter on the same equipment.

III. EVENING AND DAY SCHOOLS

1. When the accommodations have been specially provided for Day or for Evening Industrial, Technical, or Art Schools, the sums apportionable under the following scheme shall be payable for each item in actual use.

2. When the accommodations for Day Classes are used also for Evening Classes or vice versa, or when accommodations provided for High, Public, Separate, or Continuation Schools, or other purposes are used for Evening Industrial, Technical, or Art Schools, one quarter of the sums apportionable under the following scheme shall be payable for each item in actual use for said classes, in addition to any other Legislative grants that may be payable on such accommodations.

I. For each of the following classes of items, according to adequacy and suitability:

	Grade			
	I	II	III	IV
Class-rooms	$8 00	$6 00	$4 00	$2 00
Lecture Rooms	12 00	9 00	6 00	3 00
Laboratories	12 00	9 00	6 00	3 00
Workshops	12 00	9 00	6 00	3 00
Teachers' Offices	4 00	3 00	2 00	1 00
Administrative Offices	4 00	3 00	2 00	1 00
Lavatories	12 00	9 00	6 00	3 00
Waiting and Assembly Rooms	12 00	9 00	6 00	3 00
Lunch Rooms	12 00	9 00	6 00	3 00
Halls	12 00	9 00	6 00	3 00

Note 1.—The class-rooms include rooms for academic work, art work, drafting, and designing.

Note 2.—The laboratories include the rooms for chemistry, general physics, electricity, mathematics, and engineering.

Note 3.—The workshops include the rooms for:—

(*a*) Claymodelling, woodcarving.
(*b*) Woodworking, woodturning, forging, machine work, and a construction room.
(*c*) Hand sewing, machine sewing, dressmaking, millinery.
(*d*) Kitchen, laundry, dining-room, and a model household suite of rooms.
(*e*) Any other practical subject approved by the Minister.

II. For each of the following items, according to its extent, adequacy, and suitability.

	Grade			
	I	II	III	IV
School Grounds	$20 00	$15 00	$10 00	$5 00
School Building	30 00	22 50	15 00	7 50
Assembly Hall	30 00	22 50	15 00	7 50
Supply Room	8 00	6 00	4 00	2 00
Gymnasium	30 00	22 50	15 00	7 50
Reading-room and Library	12 00	9 00	6 00	3 00
Exhibition Room	12 00	9 00	6 00	3 00

Note 1.—The Assembly Hall should be provided with platform and seats, and should be suitably decorated.

Note 2.—The Supply Room is a room for selling material for the courses, or for supplying it free.

Note 3.—For the requirements of the Gymnasium, see High School Circular 8. When practicable, a swimming pool should also be provided.

Note 4.—The Reading-room and Library should be provided with book-cases, tables, chairs, and office furniture.

Note 5.—The Exhibition Room should be supplied with cases for the finished products of the school and for illustrative material.

III. For each item concerned in I and II above, according to adequacy and suitability.

	Grade			
	I	II	III	IV
Black-boards	$2 00	$1 50	$1 00	$0 50
Desks and Chairs	8 00	6 00	4 00	2 00
Laboratory and Workshop Tables	12 00	9 00	6 00	3 00
Heating	12 00	9 00	6 00	3 00
Lighting	6 00	4 50	3 00	1 50
Ventilation	12 00	9 00	6 00	3 00
Water Supply	6 00	4 50	3 00	1 50
Power Supply	12 00	9 00	6 00	3 00

Note—In grading, under III, the different items of accommodation in I and II above, the capacity of each item shall be valued in class-room units.

Accounts

The receipts and expenditures on account of the Day and the Evening classes should be kept separate from each other and from those for other school purposes.

REGULATIONS FOR EVENING SCHOOLS

Conditions of Establishments

1. No Industrial, Technical, or Art Evening School shall be recognized by the Department of Education which has not an enrolment, satisfactory to the Minister, of members duly admitted and in regular attendance from the beginning to the end of each session.

2. Except with the special approval of the Minister, the Session shall begin not later than the first week in October, and shall close not earlier than the last week in March, on dates to be selected by the Advisory Industrial Committee.

3. The School shall be open for at least an hour and a half of actual instruction on each of at least two evenings a week.

4. (1) Each teacher shall possess expert knowledge of his subject. In the appointment of such experts, the preference shall be given to those who, being otherwise qualified, are now engaged or have recently been engaged in the form of industry which they are to teach.

(2) When day teachers are employed also in the Evening Industrial Schools, their work shall be so arranged that no teacher shall teach more than an average of six hours a day, except for reasons satisfactory to the Minister.

5. (1) As far as it may be suitable, the equipment already provided for the Science, Arts, Manual Training, Physical Culture, and Household Science courses of the High, Public, and Separate Schools and the Day Industrial, Technical, and Art Schools shall be used for the Evening Schools.

(2) Where no, or insufficient, equipment has been provided which is suitable for the Evening Schools, the Boards shall provide from year to year such equipment for these schools as the Minister may deem necessary. The equipment thus provided shall, when needed, be used for the Day Schools also.

6. The organization, qualifications of the staff, accommodation, equipment, courses of study, and text-books shall be subject to the Minister's approval.

Courses of Study

7. (1) From the following lists, the Advisory Committee shall make such selection as, in its judgment, suits the requirements and capabilities of the locality; but in addition to these subjects, any other subject or subjects having a direct application to any of the local industries may be taken up with the Minister's approval.

(2) From the following lists, I and II, for boys and men and for girls and women respectively, each student shall take up such subjects as he or she may select and as may be approved by the principal. To the subject or subjects so selected, one or more of those included in list III may be added.

(3) In localities where there are Evening Commercial Classes, the provision for the special Industrial Commercial subjects may be made therein or in the classes maintained by the Advisory Industrial Committee, as the latter may consider more convenient and economical.

I. SUBJECTS FOR BOYS AND MEN

Freehand drawing, mechanical drawing, architectural drawing, design, modelling.

Woodworking, metal working, electrical working, building construction, printing, plumbing.

Physics, chemistry, mechanics.

Workshop mathematics, estimating, business English, industrial commercial work.

II. SUBJECTS FOR GIRLS AND WOMEN

Cookery, home economics.

First aid, home nursing.

Hand sewing, machine sewing, dressmaking, millinery, embroidery, laundry work.

Freehand drawing, design, colour harmony.

Business English, industrial commercial work, mathematics.

III. ADDITIONAL SUBJECTS

English literature, history and civics, physiology and hygiene, physical culture, first aid.

REGULATIONS FOR DAY SCHOOLS

Conditions of Establishment

1. No Day Industrial, Technical, or Art School shall be recognized by the Department of Education which has not an enrolment, satisfactory to the Minister, of members duly admitted and in regular attendance from the beginning to the end of each session.

2. Except with the special approval of the Minister, the limits of the school terms shall be the same as those of the High Schools.

3. The hours of opening and closing the daily session and the recesses shall be the same as those of the High Schools; but where practical work is emphasized in the programme, the hour for closing may be extended by the Advisory Committee to five o'clock.

4. Each teacher shall possess expert knowledge of his subject. In the appointment of such experts, the preference shall be given to those who, being otherwise qualified, are now engaged or have recently been engaged in the form of industry which they are to teach.

5. Where no, or insufficient, equipment has been provided which is suitable for Day Industrial, Technical, or Art Schools, the Board shall provide from year to year such equipment for these schools as the Minister may deem necessary. The equipment thus provided shall, when needed, be used for the Evening Schools also.

6. The organization, qualifications of the staff, accommodations, equipment, courses of study, and text-books shall be subject to the Minister's approval.

Courses of Study for General Industrial Schools

One matter it is important to bear in mind in the construction of the General Industrial Courses. While largely vocational, they should also include the essential cultural work in Literature, Reading, History, Geography, Grammar, and Composition in particular. This Province needs well-trained workmen and workwomen, but it needs also well trained citizens.

The following courses are intended to be merely suggestive; they are not prescribed. For most centres, except probably the largest, they may be found too comprehensive and too intensive for some years at any rate; but, with the Minister's approval, the number and scope of the subjects in each year may be reduced and the practical work of the courses may be emphasized, having regard in all cases to the capabilities and requirements of the pupils. It must be remembered, however, that no course should be established that does not make provision for the continuance of the cultural side of education, as well as the special provision for industrial work. This is especially necessary where pupils are admitted before completing the work of Form IV of the Public and Separate Schools.

The course for boys should extend over at least two years. It may extend over less time if local conditions so demand, but the longer period is greatly to be desired. Moreover, if properly conducted, this General Course should develop an interest in industrial subjects, and should on its completion, enable the student to select, with the assistance of his parents and the teacher, the industry for which he is best suited. When practicable and desirable, specialization might be permitted in the shop work at the end of the first year in accordance with the requirements of each locality; or the shop work in wood might be continued, with or without metal work, as being the best basal

preparation for most of the trades. By means either of Special Industrial Schools, or, preferably because more economical, of Co-operative Part-time schools, the boy's industrial education might be continued for a couple of years longer—to a stage where what he needs to become an expert workman is chiefly longer practice and experience. Where, at all possible, Boards should establish a four years' course for boys—two of the General Industrial School and two of the Special or the Co-operative School. The establishment of the General Industrial School would attract and retain the student from thirteen or fourteen till sixteen, the period when his growing power is greatest and his earning power is least; but only a four years' course can produce the mental and physical training needed for a life of progression in industrial efficiency. Owing to the less exacting nature of their trades, probably a year or so of a General Industrial course, followed by one or two years of a Special Industrial course, will be found to be sufficient for girls, especially where Household Science forms part of their Public School course. Owing also to the practical character of much of the courses for both boys and girls, and the future claims upon them, the school day might reasonably be prolonged to five o'clock. It should be borne in mind also that, of the following courses, some need not extend over the whole year.

Courses of Study

I. GENERAL INDUSTRIAL SCHOOLS FOR BOYS

FIRST YEAR

MATHEMATICS:

Arithmetic.—Review of elementary operations; simple approximate and check methods; four-figure logarithms applied to multiplication and division; rapid calculation; vulgar and decimal fractions; the common and the metric systems; the application of ratio, proportion and percentage to the solution of problems connected with industrial operations; simple accounts; oral arithmetic.

Mensuration.—Measurement of areas of plane figures, the triangle, the parallelogram, the trapezium, the circle, by reducing to equivalent triangle, by use of squared paper and counting the squares, by weighing similar shapes in cardboard or metal sheets; obtaining measurements by use of the measuring tools used in the trades and making calculations by graphic methods and by pocket-book formulas; volumes of simple, solid figures.

Algebra.—Elementary rules; easy fractions; simple equations of the first degree of one unknown; plotting of points and the construction of simple graphs; application of algebraical methods to the solution of practical problems; simple workshop formulas.

Geometry.—Definitions; use of compass, protractor, and ruler graduated in inches and in centimetres and millimetres; graduating of scales; accuracy of drawing to scale; measurement of angles and lines; measurement of triangles; simple constructions leading to the self-checking of the student's work.

NOTE.—In the course in Mathematics free use should be made of mechanics' and engineers' handbooks for formulas and tables.

ELEMENTARY SCIENCE:

Measurement in Metrical and English units of length, area, volume, and mass; structure and use of the Balance.

The Three States of Matter: Defined and explained; Molecular Theory.

The mechanical powers; some of their more important simple applications.

Pascal's Law, statement and verification, some of its more important applications; pressure of liquids in its various relations; Archimedes' principle; specific gravity, common methods of finding specific gravities of solids and liquids.

The properties of gas, as exhibited by air as a type; the relation between the volume and pressure of a gas; Boyle's Law; practical applications of air pressure, air-pump, common pump, siphon, air-brakes; meaning of wind pressure; some of the more important applications of wind pressure.

Nature and sources of heat, relation between the volume and the temperature of a gas; change of state; mechanical equivalents.

Simple explanations of the effects of heat in expanding solids, liquids, and gases; meaning of temperature, as compared with the quantity of heat; thermometers. Simple explanations of the effects of heat, moist air, water, and common acids on materials used for constructional purposes. Rusting, rotting, and the use of protective coverings on metal and wood; combustion of solids, and liquid and gaseous fuels, and their application to industrial purposes. Simple explanations of the chemistry of the foregoing.

NOTE.—As far as practicable the courses should be experimental and related to men's industries.

DRAWING:

Mechanical Drawing.—Instrumental drawing; geometrical construction; orthographic projection; intersection and development of surfaces; elementary working drawings, models and sketches; dimensioning; drawing to a scale; tracing and blue-printing; perspective drawings developed from plans.

Freehand Drawing.—Drawing from the flat; line work; object drawing; memory drawing; shading; outline drawing from natural forms, leaves, flowers, etc.; lettering; freehand perspective, practically developed; simple design, as applied to the work being done in the shops; quick sketches for industrial purposes.

Industrial Design.—An elementary course applicable to the shop work.

NOTE.—The course in Drawing should emphasize the accurate reading of working drawings and blue prints, and the making of quick and accurate sketches. Drawing is fundamental in the industries and should be apportioned at least four or five periods a week.

SHOPWORK:

Elementary Woodwork.—Reading of working drawings; typical problems in construction. including the principal joints used in carpentry and joinery; elementary cabinet-making and joinery; woodturning.

Designing, constructing, assembling, and finishing of one or more pieces of furniture.

Use, construction, and care of tools.

Kinds of wood and their properties; cutting and seasoning of lumber; prevention of checking and warping.

Staining, varnishing, waxing.

NOTE 1.—The Workshop Practice differs from the Primary School Manual Training in having a definite industrial outlook, and, acccordingly, in requiring a larger apportionment of time. An hour and a half or two hours a week is usually given to Manual Training; the Workshop Practice needs at least three half days a week, according to the subject and the stage.

NOTE 2.—The character of the course in shop work will depend upon the Manual Training work, if any, done in the preparatory forms of the Public and Separate Schools.

NOTE 3.—Visits of inspection should be paid to the factories in the vicinity. These visits should be made the subject of class discussions and compositions.

ENGLISH:

Literature.—Intelligent comprehension of suitable authors. Systematic oral reading in class. Memorization and recitation of choice selections. Reading of standard authors at home, and in school, aloud and silently; also of books that bear on the student's special course. The reading and study of articles in industrial and scientific journals.

Reading.—Intelligent and intelligible reading; exercises in articulation and vocalization.

Composition and Spelling.—Oral and written composition; elements of narration, description and exposition; letter writing; the spelling of words in common use, emphasis on words used in men's trades; class debates; correction of mistakes made in speaking and writing; business forms and correspondence.

Grammar.—The elements of formal grammar; emphasis on the practical applications to oral and written composition.

NOTE—The course in Composition should train to accurate, plain and forcible expression, and should include industrial topics. Suitable industrial magazines should be supplied. The course in Literature should cultivate a taste for good reading.

HISTORY AND CIVICS:

An outline of British and Canadian History, with special emphasis on that of the 18th, 19th and 20th centuries, on the most important constitutional Acts, and the industrial development of Great Britain and Canada, and on inventions, discoveries, and their results; organization and value of Trades Unions, Manufacturers' Associations, Boards of Trade, Farmers' Institutes, etc.; forms of civic government in Canada, Ontario, and Great Britain; the rights and duties of citizenship; biographies of important men and women.

NOTE.—The main object of the course should be the development of the industrial citizen, and, consequently, the emphasis should be placed upon industrial or economic phenomena—upon the development of transportation and communication, the growth of municipalities, and civic organization. This involves the changes being produced by the concentration of labour and capital in production.

GEOGRAPHY:

The principles of geography; the chief phenomena of air, earth, and sky; an elementary study of the political, commercial and industrial geography of Europe and America, with special reference to the resources, industries and commerce of the British Empire, Canada, and the United States.

NOTE 1.—Books of travel and other supplementary reading from the School or the Public Library should be supplied; also, when practicable, exhibits of the products characteristic of the countries studied; and mounted photographs of famous places.

NOTE 2.—The courses in History and Geography may be divided between the First and the Second year.

PENMANSHIP:

The formation of legible, quick handwriting.

PHYSICAL CULTURE:

Course prescribed for all the Provincial schools. So much Physiology and Hygiene as will enable the workman to care for his health. First aid.

MANNERS AND MORALS:

The course prescribed for all the other Provincial schools.

SECOND YEAR

MATHEMATICS:

Arithmetic.—Additional problems in connection with the industrial instruction in the other departments.

Mensuration.—The surface areas and volumes of prisms, pyramids, frustums, spheres, anchor rings; the use of Simpson's rules for areas and volumes of irregular figures.

Algebra.—Factoring; fractions; simple problems involving equations of one and two unknowns; indices; surds; the use of graphs in determining laws from data obtained by observation or experiment.

Geometry.—Problems of construction; geometric loci; equality of triangles; parallel lines; properties of circles; similar figures; application to problems in mensuration and surveying, such as, finding the area of a figure drawn to scale from data given in the field book.

Trigonometry.—Definitions; ratios of angles found by means of squared paper and by use of trigonometrical tables; solution of right-angled triangles; simple problems in surveying and mechanics; shop trigonometry.

ELEMENTARY SCIENCE:

Physics.—Course of the First Year reviewed; Effects of heat on substances used for constructional purposes; specific, sensible, and latent heat, and the practical application of their qualities; melting and boiling points; steam raising and the properties of steam; the transmission of heat; conduction, convection and radiation, and their applications to practical work; hot and cold water supply; exhaust steam; heating and modes of ventilating.

Magnets; laws of magnetic attraction and repulsion; polarity; magnetic induction; terrestrial magnetism; construction of simple voltaic cell; decomposition of water by electricity; electro-magnet; electric bell; telegraph; telephone; dynamo; heating and lighting effects of the current; motors.

Nature and propagation of sound; pitch of sound; consonance and resonance; reflection of sound; echoes.

Nature and propagation of light; simple experiments illustrating the reflection and refraction of light; dispersion of light; colour of bodies.

Chemistry.—Matter and energy; physical and chemical change; elements, compounds, mixtures, and solutions; acids and bases; hydrogen, oxygen, water and air; conservation of mass; oxidation and reduction; sulphur, nitrogen, chlorine, carbon; the most important of the commercial combinations of the foregoing; simple, necessary explanations of chemical theory.

NOTE.—As far as practicable the courses should be experimental and related to men's industries.

DRAWING:

Mechanical Drawing.—First year course, continued and extended; sheet metal patterns; conic sections; isometric projection; working drawings of machine and architectural details to a scale, from pupils' own sketches; tracing and blue-printing. Working drawings of the objects being constructed in the shops.

Freehand Drawing.—Work of the first year continued and extended; rendering in pencil, ink, charcoal and wash; freehand perspective; sketching from machine and architectural details; conventionalization of natural forms, flowers, etc.; composition; design as applied to the shop work in hand.

Industrial Design.—An elementary course applicable to the shop work.

SHOP WORK:

The course in woodworking affords the best general elementary training in the use of tools. The course of the first year may accordingly be continued and extended; but when the local industries are varied in character, specialization may be provided as follows, for example:

(*a*) For pupils who expect to engage in machine construction or operation, or in machine drafting, or allied occupations;

Elementary Machine Pattern Making.—Allowance for shrinkage of castings; the necessary taper for withdrawing a pattern from the mould, allowance for subsequent machining of casting; patterns made in halves; use of cores; core-boxes and core-prints; work built up in segments to avoid shrinkage and give strength; parts dovetailed or pinned on, to allow of withdrawal from the mould.

Metal Work.—Use of hammer, chisel, file and scraper; forging; lathe work; elementary machine shop practice.

(*b*) For pupils who expect to engage in building construction or architecture or allied occupations:

Elementary Building Construction, including more difficult joints than those in first year work; doors and door frames; window sashes and frames; laying out simple work; arches; mitred work; glueing; lathe work.

(*c*) For pupils who expect to engage in artistic trades:

Artistic Work.—Modelling in plasticine and clay; work in copper, brass and leather, giving practice in designing, etching, cutting, fitting rivetting, soldering, hammering, and the raising of leather and sheet metal.

(*d*) For pupils who expect to engage in electrical trades:

Electrical Work.—Names of tools and their uses; simple wiring and lighting; connecting of batteries with bells, push buttons, etc.

NOTE.—Each course should include elementary shop economics and simple specifications.

MATERIALS:

The growth, character, and uses of various woods; the methods of preparation and manufacture of other natural products useful to man, as, for example, cotton, linen, and wool; the various kinds of coal, oil, clay, building stone, concrete, mortar, and cement; metals used in the industries; methods of tempering and preserving steel; the composition and uses of brass, Babbitt metal, pewter, etc.

ENGLISH:

Literature.—Course of the first year continued and extended.

Composition.—Oral and written composition; elements of narration, description, exposition, and argumentation; class debates.

Grammar.—Course of the first year reviewed; emphasis on the practical applications.

HISTORY AND GEOGRAPHY:

Courses of the first year continued and extended.

BOOKKEEPING, BUSINESS FORMS:

Enough single entry to enable the pupil to keep records of petty cash or stock-room accounts in a shop; the formation of a legible, quick handwriting.

NOTE.—When the course is continued long enough, the pupil should be trained to carry out any cost system he may find in the shop where he may be employed.

PHYSICAL CULTURE:

Course of the first year continued and extended.

MANNERS AND MORALS:

Course of the first year continued.

GENERAL INDUSTRIAL SCHOOLS FOR GIRLS

FIRST YEAR

HOUSEHOLD SCIENCE:

Cookery.—Common food materials and their dietetic values; plain cooking; fruit preserving and canning; care of kitchen and kitchen utensils; the use of the stove and its various parts. Planning a meal; table service.

Household Economics.— Management, routine; care of house; furnishings; estimating cost of furnishing kitchen, etc.; sanitation and disposal of waste.

Sewing.—Hand Sewing: The various stitches; button-holes, etc.; darning and mending; cutting by patterns and making a simple draft; the making of a hand-made garment; the use and care of domestic sewing-machines; the making of undergarments.

Textiles.—Development in relation to the industries connected with textile manufacture. Evolution of spinning and weaving and inventions connected with these. Results of these inventions. A general study of natural and manufactured fibres as used in textile industries.

NOTE.—In Household Science, as well as in Manual Training, more time is needed than for the cultural and practical Household Science of the Primary Schools; and, on account of the limitations of the rest of the course, more time can be apportioned to the shop work of the girls than to that of the boys. Visits should be made to the local "openings." These visits should be made the subject of class discussions and compositions.

MATHEMATICS:

Arithmetic.—Review of elementary operations; rapid calculation; oral arithmetic; vulgar and decimal fractions; application of ratio, proportion, and percentage to problems connected with women's trades and businesses; simple accounts.

MENSURATION:

Measurement and calculations of areas of plane surfaces, as needed for women's trades.

ENGLISH:

Literature.—Intelligent comprehension of suitable authors. Systematic oral reading in class. Memorization and recitation of choice selections. Reading of standard authors at home and in school, aloud and silently, and of some books that bear on the pupil's special course. Articles in journals and magazines that deal with special points in the course.

Composition and Spelling.—Oral and written composition; the spelling of words in common use, with emphasis on the words used in women's trades; elements of narration, description, exposition, and argumentation; letter writing; business forms and correspondence.

Oral and written reproductions or abstracts; class debates; correction of mistakes made in speaking and writing.

Reading.—Intelligible and intelligent reading; exercises in articulation and vocalization.

Grammar.—The elements of formal grammar; emphasis on the practical applications to oral and written composition.

NOTE.—The course in Composition should train to accurate, plain, and forcible expression, and should include industrial topics. Suitable industrial magazines should be supplied. The course in Literature should cultivate a taste for good reading.

HISTORY AND CIVICS:

An outline of British and Canadian History, with special emphasis on that of the 18th, 19th, and 20th centuries, on the important constitutional Acts, and the industrial development of Great Britain and Canada, inventions, discoveries, and their results; organization and value of Trades Unions, Manufacturers' Associations, Boards of Trade, Farmers' Institutes, etc.; forms of civic government in Canada, Ontario, and Great Britain; the rights and duties of citizenship; biographies of important men and women.

NOTE.—The main object of the course should be the development of the industrial citizen, and, consequently, the emphasis should be placed upon industrial or economic phenomena—upon the development of transportation and communication, the growth of municipalities, and civic organization. This involves the changes being produced by the concentration of labour and capital in production.

GEOGRAPHY:

The principles of geography; the chief phenomena of air, earth, and sky; an elementary study of the political, commercial and industrial geography of Europe and America, with special reference to the resources, industries and commerce of the British Empire, Canada, and the United States.

NOTE 1.—Books of travel and other supplementary reading from the School or the Public Library should be supplied; also, when practicable, exhibits of the products characteristic of the countries studied; and pictures of famous places by means of mounted photographs.

NOTE 2.—The courses in History and Geography may be divided between the First and the Second year.

DRAWING:

Freehand.—In outline, light and shade, from models and casts; from observation and from memory; drawing from natural forms, leaves, flowers, etc., with simple conventionalization; freehand perspective; quick sketches to show designs; costume sketching.

Design.—The principles of design and colour harmony, applied to curtains, tucks, ruffles, embroidery, pillow-shams, etc.; making of drafts and patterns; combinations of colour and trimmings for dresses and headwear. Relation of house to surroundings; planning of house, colour schemes, interior decoration, hanging of pictures.

PENMANSHIP:

The formation of legible, quick handwriting.

PHYSICAL CULTURE:

Course prescribed for all the other Provincial schools. So much Physiology and Hygiene as will enable the workwoman to care for her health. First aid.

MANNERS AND MORALS:

Course prescribed for all the other Provincial schools.

SECOND YEAR.

HOUSEHOLD SCIENCE:

Cookery.—Course of the first year continued and extended, including advanced cookery, invalid cookery, and dieting for infants.

Household Economics and Hygiene.—Course of the first year continued and extended; municipal and state sanitation; transmissible diseases; disinfecting and disinfectants.

Sewing.—Dressmaking; drafting; cutting out; fitting; making shirtwaists, shirtwaist suit; designing; making dresses; application of trimmings, lace, etc.; the use and care of power sewing-machines.

Millinery.—Drafting; making buckram shapes from draft; making wire shapes; covering with silk, velvet, straw; trimmings; finishing; colour harmony; making and trimming hats; textiles.

Laundry.—Elementary work. Soft and hard water, soap, soda, etc.; their effects on various fabrics.

ARTISTIC WORK:

Sample mounting, book covers, tissue paper novelties and decorations; braiding and embroidery; basket work; stencilling; wood-carving; china-painting; leather work.

ELEMENTARY SCIENCE:

The three states of matter explained and defined.

The properties of a gas as exhibited by air as a type; the barometer; the relation between the volume and pressure of a gas; practical applications of air pressure, air-pump, common pump, siphon.

Nature and source of heat; experiments to illustrate the expansion of solids, liquids, and gases by heat; some practical applications of the principle of expansion; the anomalous expansion of water, its significance; meaning of temperature as compared with quantity of heat; the mercury thermometer; meaning of latent heat, applications; effects of heat upon cooking materials.

Nature and propagation of sound; pitch of sound; consonance and resonance; reflection of sound, echoes.

Nature and propagation of light; simple experiments illustrating the reflection and refraction of light; dispersion of light; colour of bodies.

Magnets; laws of magnetic attraction and repulsion; the simple voltaic cell; electro-magnet; electric bell; telephone; heating and lighting effects of the current.

The air and its constituents; water and its constituents and properties; limestone and its decomposition products, quicklime and carbon dioxide; bleaching and bleaching powder, dyes; simple explanations of chemical theory.

NOTE.—As far as practicable the course should be experimental and related to women's industries.

Textiles.—**The distribution, growth, preparation, processes, marketing and manufacture of the leading textile fibres, cotton, wool, linen, silk. Simple tests for the identification of these fibres either as adulterants or in their proper uses. A special study of fabrics and their uses, with continued work on other textile fibres. Cost of materials. Practical work in choice of materials.**

NOTE.—Where practicable some of the laundry work might be taken in the first year, when there is only a one year's course.

FREEHAND DRAWING AND DESIGN:

The work of the first year continued and extended.

NOTE.—The work should be framed so as to bring it into harmony with the aims of the pupil. The creative and design faculties of the pupil should be guided so as to secure close application of the instruction she has received in drawing and design and in colour harmony, **to the special line of industry she has selected. The value of art and its application should be emphasized.**

ENGLISH.

Literature.—Course of the first year continued and extended.

Composition.—The course of the first year continued and extended.

Grammar.—Course of the first year reviewed; emphasis on the practical applications.

BOOKKEEPING AND BUSINESS FORMS:

Enough single entry to enable the pupil to keep records of petty cash or stock-room accounts in a shop; bills, cheques, notes, drafts, etc.; the formation of a legible, quick handwriting.

NOTE.—When the course is continued long enough, the student should be trained to carry out any cost system she may find in the shop where she may be employed.

PHYSICAL CULTURE:

Course of the first year continued.

MANNERS AND MORALS:

Course of the first year continued.

RECOMMENDATIONS BY INSPECTOR LEAKE

General Situation

The movement in favour of Industrial Education has made gratifying progress since the passing of *The Industrial Education Act.* It is now generally recognized that the time for mere academic discussion has passed and that definite plans and organization are required. Whatever hints and suggestions we may get from other countries the problem will remain peculiarly our own. It will not do to copy; we should only adapt. Each locality has its own problems and these must be solved strictly according to local requirements. The efforts put forth so far have been mainly in the direction of Evening Classes; they seem to offer the line of least resistance. Outside of Brantford, Hamilton, London,, and Toronto, nothing, however, has been done in the direction of real industrial day classes. There seems to be unfortunately an indifference, if not an antipathy, to any form of instruction which is calculated to fit directly for work in the shop or at the bench. This indifference must be overcome before parents will be willing to place their boys in such schools. They must be shown the money value of industrial training. A large portion of the attendance at the present evening classes consists of mature men and women, in many cases fathers and mothers. After a session or two of such classes they will, no doubt, learn that the instruction given is worth while and will in the future be willing to make the sacrifice necessary to allow their children to attend day classes.

Process of Establishment

The first step in the establishment of industrial classes is the formation of an Advisory Industrial Committee. The members should be selected with considerable care as much of the success depends upon the efforts put forth by this Committee. It should be as representative as possible of the different industries of the locality. The meetings should be held at stated times, at least monthly, at the school and not in an office down town. All the members should be workers and should not regard their duties as confined to attending the meetings. They should visit the school regularly, inspect the registers, and take an interest in the work generally. The members can do effective work among the people by advocating on every possible occasion the training given by the school. Where there are likely to be large classes of girls and women it is advisable to appoint at least one woman on the Committee. Where there is a Public School Board it often facilitates matters if one of the elected members of the Committee is chosen from that body.

Publicity

The school should be well but judiciously advertised. Posters in the factories and elsewhere, the former being provided with a space for the endorsation of the firm, the distribution of circulars to factory employees and artisans, provided with a detachable application blank are some of the means that may be adopted. The fullest use should be made of the local newspapers. The classes should be brought closely to the attention of all boys and girls in forms III and IV of the Public and Separate Schools who do not intend to enter the High Schools. The school should be opened some days before actual class work begins and an announcement made that the Principal and his staff are ready to advise intending students and their parents as to the course of study best suited to the individual.

Organization and Management

Every school should have a Principal to take general oversight of the organization, curriculum, etc. In very large schools he should have no class directly under his charge but in the smaller ones he may perhaps teach half his time. The appointment of such a Principal is all the more necessary when it is considered that the majority of the teachers will be practical men and women from the shops with little or no experience in teaching and in solving the problems of the class-room. The Principal should keep in close touch with the factories and other industries in order that the instruction may be kept up to date; and, that he may know the type of man required and be able to advise both employer and employee in their choice. He should report monthly to the Committee. His report should show for each subject the number registered, the number in attendance each night, the average attendance and the percentage of the registered attendance. The registers should be kept and marked in ink. They should show for each student the name, address, occupation, and previous training. Where fees are charged the Principal should be instructed to remit them, if in his judgment the financial condition of the student or his parents renders it advisable to do so. This will of course be done privately. Every effort should be made to keep up the attendance. The cause of absence or discontinuance should, in every case, be sought for. In some schools reply post cards are sent, but a much better plan is personal inquiry by the teachers or members of the Committee. The names of persistent absentees who cannot satisfactorily account for their absence should not be retained on the register. The day school authorities should provide the Principal of the Evening School with a record of every boy and girl showing character, ability, attainments, etc. After the organization of the Committee and the appointment of the Principal a general investigation should be undertaken of the industries of the district, with the object of discovering the subjects most desirable and feasible, and the kind of instruction required by the employer and needed by the employee. At the same time the employer should be urged to show a practical, not merely an academic, interest in the industrial classes, by granting certain privileges, bonuses, increases of wages, or promotion to employees taking a satisfactory course of instruction.

Every effort should be made to induce students to take up related courses of study rather than isolated subjects; the diploma courses of Hamilton, London, and Toronto afford good examples of suitable courses. Classes should be small. No class should exceed twenty, and fifteen is a better number. No matter what system of classification is adopted much of the instruction must be individual. In this work particularly, the more the individuality of the pupil is recognized and the more his special requirements are taken into consideration, the more regular will be his attendance and the more satisfactory will be the result. Many of the present classes, particularly those for women and girls and for mechanical drawing are much too large.

Students should be classified according to qualifications, age, and occupation. In some of the present classes the ages vary from 14 to 50 and in one school forty-three different trades are represented. No man of thirty or over cares to show his lack of knowledge or training before boys of 14 or 16. The drawing and mathematics (beyond the rudiments) required by the carpenter are different from those required by the machinist. At first it will probably be found that all require the same preliminary instruction but after the first year differentiation will probably

be necessary. No student should be admitted to a class, who from want of sufficient preliminary training or other cause is unable to take full advantage of the instruction given. The methods of approaching subjects in the evening voluntary classes should differ materially from those employed in the day schools. In the former, students have been discouraged and have discontinued their attendance owing to the fact that they could not see the bearing of the instruction on their daily work or that the instruction was not suited to their needs. In mechanical drawing, mathematics, and science, for instance, they have been kept working at preliminary plates, exercises, and problems which with their limited knowledge they could not recognize as being of practical value. Work in all subjects should begin with shop problems of immediate use. After the student is convinced of the applicability of the instruction to his daily labour he will be quite willing and anxious to take up, if necessary, the elementary work on which these problems are based. Drawing should be taught more generally from specifications than from plans and plates which require only copying to the same or a different scale. The teacher should prepare a summary of each lesson and this summary in the form of typewritten sheets or cards be handed to the student at the close of the lesson. This method enables students who are unavoidably absent to keep up the continuity of the work and gives all an opportunity of review before the commencement of another session.

Teachers of the academic subjects and others who are not actually engaged in the trades should make themselves acquainted with the needs of their students. This applies particularly to drawing, mathematics, English, and science. In order to enable such teachers to do this they should be appointed before the summer vacation, part of which they can utilize for this purpose in the factories and at special schools. The attendance at the classes is seriously affected when the exact instruction required is not given.

In the case of schools already established second year classes should be provided for those who took the course the year before. First and second year students should not be taken together and no attempt should be made to take pupils over work a second time except in so far as a preliminary review is necessary.

At the close of the session the plans for the next year should be outlined to the students and they should be asked to register for the subjects they intend to take up the following session. The students should not be lost sight of during the summer. One night a week might be devoted to interviews with those who require help or direction in their reading. A working arrangement between the Public Library and the school might also be carried out to the manifest advantage of both. Nor should the social side be overlooked. A concert, or a popular lecture or two, during the session will do much to develop a school spirit and introduce the students to each other. Last year the Stratford school closed its winter session with a banquet prepared by the Household Science Classes, after which the certificates earned were distributed.

Accommodations and Equipment

The day school accommodations and equipment are provided at the public cost and should be used as far as possible for evening school students. When the school possesses a gymnasium it should be thrown open to the evening school pupils. No student should be admitted to this who is not taking an approved course in the school. The work should, of course, be done under proper supervision.

SCHOOL ATTENDANCE ADOLESCENT ACT

Provisions in Other Countries

It is a well-understood maxim of civil polity that in countries where the people have a part in the function of government the electorate should possess at least an elementary education. This principle is recognized in the maintenance of free schools at the public expense, and the enactment of Truancy Acts and Acts of a similar character. The provisions of such Acts vary in different countries. In France, for example, the child must pass an examination. This he is usually able to do when about twelve or thirteen years of age. In some other countries, as in Ontario, attendance is compulsory until he is fourteen years of age or has passed the High School Entrance Examination.

Some of the most progressive countries have gone still further; they have enacted general compulsory attendance laws of which each locality may avail itself, under varying conditions of age, attendance, and system of operation. Germany and Switzerland, where the age limit is usually seventeen or eighteen, are the best examples of the operation of a law of this kind. In these countries, with comparatively few exceptions, each municipality has voted in favour of its adoption, and, as the most important interest in these countries is manufacturing, the compulsory laws have special reference to industrial education. The beneficial effects of a law of this kind are admitted; Germany and Switzerland are in the forefront of commercial supremacy. And Scotland has gone still further. It is a noticeable fact that there is no local option provision. In 1908 the Scotch Education Act was amended by the insertion of sections providing for the compulsory school attendance of adolescents, and making it the duty of School Boards to provide suitable classes for the further instruction of young persons above the age of fourteen and up to seventeen. Similar compulsory attendance Acts are also being introduced into some of the States of the Union, and there can be no doubt that the movement in favour of this grade of compulsory attendance will be generally adopted before long by countries that have Elementary systems of education maintained at the public expense.

As has been already stated, our Truancy Act provides for the attendance of pupils until they are fourteen years of age or have passed the High School Entrance Examination. *The Adolescent School Attendance Act,* with its local option and exemption clauses, passed at the last session of the Legislature, becomes operative as soon as the children are free from the provisions of *The Truancy Act,* and provides for their school attendance thereafter until they are not more than seventeen.

This Act has been adopted by the City of London, and will come into force next January. An account of the course taken to secure its acceptance and of the provisions already made for its operation will be found further on in the report of the Principal of the London General Industrial and Art Schools.

Synopsis of the Act

Jurisdiction of the Boards

(1) The jurisdiction of the Boards which possess the power of enforcing compulsory attendance under this Act is as follows:

Schools and classes of the High School grade are under the Boards of High School Trustees, the Boards of Education, and Continuation School Boards of urban Continuation School districts; and schools and classes provided for under

The Industrial Education Act; that is, industrial, technical, and art schools and classes and commercial schools and classes, are under the Advisory Industrial and Commercial Committees respectively.

(2) Schools and classes of the Public School grade are under the Boards of Education, and urban Public and Separate School Boards.

Local Option

As the establishment of schools under this Act limits the control by the parent or guardian and the employer over the adolescent, and as it might involve a large expenditure by the ratepayers, the Act provides that no classes shall be established under it without an opportunity being given to the ratepayers for passing judgment on any proposed by-law.

The provisions are as follows:

(1) The by-laws must be passed by the Board at a special meeting, after due public notice of the meeting and the object thereof has been given by advertisement. Under this provision, a ratepayer may bring his views before his representatives on the School Board and so indirectly control the result.

(2) If within thirty days after the passing of the by-law under the Act, ten per cent. of the electors of the municipality petition the Council, praying that the by-law shall be submitted to the electors, the Council shall do so, not later than the next general municipal election. Under this provision, the ratepayer may directly control the result.

By-Laws

Under the Act, the Board has full discretionary powers which it is expected to exercise in accordance with the needs and capabilities of the locality.

The Board may provide compulsory attendance at the classes or schools, either established by the Board or at some other school in the municipality, of every adolescent who is not exempt under the by-law, provided, however, no child of the supporter of a Roman Catholic Separate School shall be required to attend any of the classes of a Public School.

It may provide courses of study and appoint teachers and instructors, and, in addition to the regular day classes, it may also establish and require attendance at special day and evening classes, including special classes for either sex or for both, and for those engaged in particular trades or other occupations. It may fix the seasons of the year and the number of hours in each day and in each week for the compulsory attendance.

And further, in accordance with the object of *The Industrial Education Act,* the details of the courses for those engaged in trades or like occupations are to be settled by the Advisory Industrial Committee and the details of the Commercial course by the Advisory Commercial Committee.

The Classes provided may, accordingly, be:

(1) The ordinary Day School Classes;

(2) Ordinary Evening Classes; and

(3) Other Day and Evening Classes which employees shall attend at certain seasons for a certain number of days in each week and of hours in each day as may be determined by the by-laws; that is, Co-operative Classes.

The Act also provides for the exemption from attendance of individuals or classes of individuals who are so provided for in the Act or the by-laws.

Duties of Parents and Guardians and of Employers

Under the Act, the employer is obliged to give notice to the Board of the names of the adolescents in his employment and the hours during which they work for him. He is also obliged to release the adolescent for the number of hours during which he may be required to attend the day classes provided for him by the Board, with the provision that the total daily number of hours of employment and of attendance at compulsory classes shall together not exceed the total number of hours during which the adolescent may be lawfully employed.

The parent or guardian is also required to see that the adolescent attends the classes provided for him.

In the case of disregard of the provisions of the Act, the employer or parent or guardian incurs a penalty not exceeding $5 for the first offence and not exceeding $25 in the case of the second offence.

Powers and Duties of Truant Officers

For the purpose of enforcing the by-laws, the Truant officer appointed under *The Truancy Act* possesses the power and shall perform the duties enforced and imposed on him by that Act.

APPENDICES

APPENDICES.

As has been stated already in the Prefatory Note, at the present stage of the solution of our problem of providing for Industrial, Technical, and Art Education, the following resolutions are valuable as shewing the present attitude of the two classes who are immediately concerned. The conditions in the United States greatly resemble those in Canada, and the resolutions of the manufacturers and labour men of that country are well worth our attentive consideration.

APPENDIX A

Report of Technical Education Committee of the Canadian Manufacturers' Association

(From Industrial Canada, May, 1911)

I. Decline of Apprentice System

The widespread desire of manufacturers the world over for technical education during the past generation is due almost altogether to the decline—indeed, one might say the breakdown—of the old apprentice system. Without fully tracing the causes, with which your body is already familiar, of the failure of the time-honoured method of educating journeymen to meet the requirements of modern industrialism it may be accepted as a fact. Even in these trades in which it still exists nominally, it is rendered useless by severe limitations placed on it. In the moulding trade, for example, the regulations in this city demand that there shall be only one apprentice for every eight journeymen. If the period of apprenticeship is fixed at four years, this means that a full generation must elapse before there is a new journeyman to take the place of an old one. Admitting for the sake of argument that death was the only source of removal of a working journeyman in that period, the ratio is still out of all proportion. Actuarial tables show that a journeyman moulder lasts much less than 32 years. But when we take into consideration the fact that many moulders desert their trade for other occupations, develop into foremen, or commence business for themselves, the result of the restrictions is apparent. Owing to the exceptional opportunities offered to all classes of Canadian citizens through the rapid development of Canada, particularly in the West during the past ten years, your Committee believe that the number of journeymen who desert their trades is higher in Canada than in any other country. This condition will in all probability prevail for another generation. Every year when the Homeseekers' Excursions are announced large numbers of employees in the factories of Eastern Canada desert their occupations to go West and become farmers or make their living in some other way. This makes the restrictions on the apprentice system even more onerous than they otherwise would be.

II. Need of Completely Trained Managers

Even were the apprentice system in good working order to-day, it is doubtful whether it would fully meet the demands of the highly-specialized industries of this century. The greatest difficulty manufacturers have to face is the securing of competent, well-trained mechanical experts to act as foremen, superintendents, managers, etc. Such men must not only be well up in actual trade practices, but must also know the theory of their work. The old apprentice system could meet the first requirements, but it would have to undergo important modifications to fulfil the second condition. It is probable that it could be developed so as to provide theoretical training if it were free from restrictions. This has been amply demonstrated by the splendid systems developed by several firms in the United States, notably the Brown & Sharpe Machine Co., of Providence; The General Electric Co., of Shenectady; The Baldwin Locomotive Works, Philadelphia; The Hoe Press Co., New York City, and several others. We would request that the Commission devote special attention to those systems when visiting United States. They show in a very practical manner how theoretical training can be co-related with shop practice.

It is the dearth of competent executive men for the shops that impairs the industrial efficiency of Canadian factories more than anything else. Very few of these men can be recruited from the mechanics of this country, because of the lack of technical education facilities. It is true these facilities are supplied on a limited scale by a few Canadian

firms, but the movement has not developed far enough to improve conditions to any extent. The result is that many of the factory executives, as well as many of the highest paid artisans, are recruited from the industries of Great Britain and United States, where technical education has been established for many years. The system to be adopted in Canada should aim primarily at remedying this evil.

III. Provide Technical Courses in Secondary Schools

Your attention has already been directed to the fact that our educational systems are devoted almost entirely to preparing pupils for commercial or professional careers. Very little effort is made to interest the pupil, who, when a certain stage in his education is reached, fails to respond to the effort of the teacher. This pupil is not to be condemned as an idler at once. Very probably his awakening mind is attracted by mental food other than that offered him in the rigid curriculum of our present system. He may desire to work with his hands and through a different system could easily be interested in studies which would tend to guide those hands in their work. This pupil should not be turned out of the schools in a dissatisfied frame of mind. He should be retained until definite convictions have been reached as to what purpose he shall devote his life.

Under our present educational system many pupils are driven by the system itself or by their parents into commercial and professional life, who would be much better suited for executive positions in our workshops. Too often parents do not realize the prizes that are available in industrial life, and only in recent years have our educational authorities awakened to the fact that the educational system as at present devised tends to take the youth of the country away from industrial life.

The question presents itself—how can he be retained under the beneficent influence of discipline and study longer? We would suggest that some plan be adopted along the lines recommended recently by the Senior Principal of Toronto High Schools, to whose report we would respectfully suggest the Commissioner's attention. Preliminary courses in technical education to fit in with the practical work of the manual training schools, perhaps, might be provided in the higher classes of the Public Schools, and in the lower forms of the High Schools. These courses should be arranged as far as possible to reach the pupils who are dissatisfied with the ordinary "book learning" courses and whose wish it is to learn a trade.

IV. Shop Practice

In connection with these preliminary courses, advanced courses in technical training should be established in separate buildings. These schools would have the same standing as the present high schools, and should contain shops where actual trade practices could be taught.

V. Night Classes

Night classes should be given in advanced schools for the benefit of those who cannot afford to remain in school in the day time beyond the time necessary to take the preliminary courses. These night classes should be continued over the entire year as far as possible.

VI. Provide for Individuality of Pupils if Possible

In drawing up the curriculum for the preliminary and advanced courses, provision should be made if possible to give greater scope for the individuality of the pupils. This would tend to produce the type of men required to fill executive positions in our industries probably more quickly than any other means that could be adopted. It is recognized, of course, that too much freedom in this dircetion might defeat the object in view. It is also recognized that the development of the system along these lines would prove expensive, but it is hoped that something may be done in this direction.

VII. Question of Cost

The question of cost naturally looms up in considering the problem of technical education. It must be recognized that the development of technical education is going to cost a considerable amount, but we feel that it will be money well spent, and hope that when the report of your honourable body is published, it will educate the citizens of Canada in this direction. In this connection it occurs to us that the larger cities and municipalities should not be expected to provide facilities for technical education for all the territory in their vicinity as seems to be the case at present, unless provision is made for outside financial aid. It is recognized, of course, that the biggest schools will

be situated in the big cities and that many of the pupils will come from outside the cities. We feel strongly, however, that Federal and Provincial aid should be provided. This method has been followed with great success in the United States, Germany, and other countries, and should be adopted here. Otherwise the bigger municipalities will shrink from providing the funds for the erection and equipment of proper schools.

VIII. Native Canadian Industries

There are few things which cannot be made in Canada to advantage; therefore, every industry should be considered. Those now established will naturally have the first claim upon your attention, but you will doubtless take into special consideration the development and establishment of those industries whose raw material is a natural product of Canada.

IX. Alternating Classes—Shop and School

In connection with the advanced schools provision should be made, wherever feasible, for the establishment of courses of study in which two divisions of the pupils alternate in shop and school work. In some industries, local manufacturers can be found who will co-operate in arranging these courses, which have proven most beneficial and successful in certain United States cities. The pupils spend, say, two weeks, in certain school and laboratory work, and then go to a factory for two weeks, where they see an exemplification of the processes they have just studied. Their place in the classroom is taken by another division, who follow them again in the factory, and so on. The method lends itself admirably to the development of thoroughly-trained mechanics, and is calculated to hold the interest of the pupils who have special aptitude along mechanical lines.

X. Local Conditions to be Considered

As far as possible the technical education facilities in any section of the country should be developed along special lines to meet local requirements. There should be a certain amount of latitude allowed the educational boards of the different municipalities so as to enable them to suit the courses they offer to the industrial requirements of their vicinity. The desire for uniformity should not be pushed to extremes.

Apart from the preparation of this statement there has been very little for your Committee to do during the year. Obviously nothing was to be gained by attempting to further the projects mentioned in the reports of former years, because of a general desire to await the result of the present investigation and to shape future actions as far as possible in accordance with any recommendations the commission might have to offer. The report proper, therefore, ends at this point.

APPENDIX B

Resolutions adopted by the National Association of Manufacturers of the United States of America, 1912

WHEREAS, one half of the children in the common schools of the United States leave school by the end of the sixth grade, with no substantial education requirements beyond reading, writing, and arithmetic in their simpler forms, the essentials of education and citizenship coming, if at all, after the sixth grade, and

WHEREAS, this half of the children soon forget much of what they learned in their brief school experience, and

WHEREAS, truancy and absence are so prevalent that less than three fourths of the children are in school as much as three fourths of the time, the enrolment being 17,000,000 and the average attendance being under 12,000,000, 1,600,000 being permanently absent from and unacquainted with school life, and

WHEREAS, illiteracy in the United States is fifty times that of several continental countries and is four times greater among the children of native whites than among the native born children of immigrants, and

WHEREAS, in many schools and many cities educators are finding great cultural and educational value in the development of the motor activities, the practical and creative desires of the youth, in highly developed practical and extended courses in manual and prevocational training, and such courses are developing, in an unexpected degree, an appreciation of the dignity of labour of all kinds, and such moral qualities as diligence, concentration, perseverance, and respect, and causing many to successfully continue in school who otherwise would leave discouraged early in the course, and

WHEREAS, a majority of the children who leave school prematurely, do so from no economic need, and in fact are idle about half the time between their fourteenth and

sixteenth years, being the first two years out of school, and average for the first two years little over $2.00 per week in earnings, leaving school principally because their interest in practical and creative effort is not provided for, and

WHEREAS, the loss to the schools of 50 per cent. of the children in the middle of the elementary school courses is an incalculable waste of the human resources of the nation, these human resources being estimated by Professor Fisher as of the economic value of $250,000,000,000, and five times the value of all our other natural resources combined.

Therefore, for these and other reasons, the National Association of Manufacturers by resolution pledges its earnest support of the following principles of educational betterment as essential to society and to the spiritual, social, and physical welfare of the youth:

1. Continuation schools for that half of the children who leave school at fourteen years of age, and mostly in the fifth and sixth grades, these continuation schools to be liberally cultural and at the same time to be extremely practical and related as directly as possible to the occupations in which the several students are engaged.

2. The development of a modern apprenticeship system wherein by contact the respective and equal rights of employer and employee are fully recognized, the entire trade is taught, together with such other subjects as are essential to good citizenship.

3. The development of secondary continuation or trade schools, by which the more efficient of the great army of boys and girls who will enter the continuation schools may progress from these lower continuation schools, as in some other countries, to the foremost places in industry and commerce.

4. Compulsory education through adolescence, being until the seventeenth or eighteenth year, attendance being in the all-day school until the fourteenth year, and thereafter in either the all-day schools or in the continuation schools for not less than one-half day per week, without loss of wages for hours in school.

5. The strengthening of all truancy laws and the development of public sentiment in support thereof.

6. The training of teachers in thoroughgoing methods of industrial practice, including as part of such training extended experience in actual shop work.

7. The establishment of independent State and local boards of industrial education consisting of one third each, professional educators, employers and employees, thereby insuring, as in the more successful European countries, the proper correlation of the schools and the industries.

8. The development of the vocational and creative desires of the concrete, or hand-minded children now in the grades, discouraged, anxious to quit, and often called backward, only because the education now tendered them is abstract and misfit.

9. The establishment of shop schools and part-time schools whenever practicable.

10. The establishment of departments or centres of vocational guidance so that the great majority of the children who now enter industry at fourteen with no direction, 85 per cent. falling into the "blind alley" occupations, may with the reversal of these figures, as in some other countries, enter, under advice, intelligently and properly into the progressive and improving occupations.

Resolved, By the National Association of Manufacturers, that it is the imperative need of the industrial workers and employers of the country that thoroughgoing systems of industrial education be everywhere established, so that our factories may be more constantly and better employed; that standards of skill and of output may increasingly be improved, and that foreign and domestic markets may be better held and extended.

APPENDIX C

Recommendations and Conclusions of the Committee on Industrial Education of the American Federation of Labour, 1912, presented to the Senate of the United States

Recommendations

The committee, after due consideration of the importance of the several systems of schools now in operation throughout the country recommend the following specific types of schools for the advancement of the prospective apprentice to the trades, as well as for those who have already entered the trades:

1. Supplemental technical education: Supplemental technical education for those already in the trades. The demand for such instruction is measured by the necessity for training in particular trades and industries, and the chief aim of such instruction should be to present those principles of arts and sciences which bear upon the trades either directly or indirectly. Such schools are commonly known as continuation schools, whether their sessions are held in the day, evening, or on the part-time plan.

2. Industrial education: The establishment of schools in connection with the public school systems, at which pupils between the ages of 14 and 16 may be taught the principles of trades, not necessarily in separate buildings but in schools adapted to this particular education by competent trade-trained teachers.

3. Trade-union schools: The committee recommends the continuance of progressive development in supplemental trade education as inaugurated by trade-unions, such as the supplemental trade courses established by the International Typographical Union; technical courses of the Photo-Engravers' Union; School for Carpenters and Bricklayers, Chicago, Ill.; the International Printing Pressmen's Technical School, at Rogersville, Tenn.; and the School for Carriage, Waggon and Automobile Workers, of New York City. The committee further recommends that all trade-unions which have not adopted a scheme of technical education give the matter the consideration it so richly deserves; and they further believe that the undertakings of the above unions call for the most enthusiastic admiration and are entitled to the most cordial and loyal support.

4. We finally recommend that if in the course of time schools under public administration with a broad and liberal course of instruction (with an advisory committee composed of employers as well as trade-unionists) shall demonstrate practical efficiency in training workers for the highly skilled trades, we favour the recognition of that portion of time spent in the schools which, after an examination by the union at interest of the practical and theoretical ability of the apprentice, can be considered comparable to actual training in particular trades as a substitute for a period of the apprentice's time spent entirely in the industry.

Conclusions

The committee believes that there are pressing educational needs which can at least partly be solved by the introduction of industrial training. At present a very large proportion of the children leave school between the ages of 14 and 16. They change from one occupation to another, having no particular qualification for any vocation, and gain little in efficiency. Industrial education between the ages of 14 and 16 ought to awaken a new school interest and help to retain them longer in school; moreover, if industrial training took the children between the ages of 14 and 16, when they are of little value in a business way and at a time when such education as they have received is of advantage to them so far as it goes, but hardly fits them for actual working places, then it would give them the proper training to prepare them to enter some branch of trade or vocational work. At the time our present public school system came into operation it met the needs of the people; the industries were carried on in the home, and the children were taught the manual arts there; the boy was taught his trade by his father, and the girl and her mother carried on in the home much of the work now performed in the factory. Economic conditions have changed and the schools must change with them. The ranks of skilled labour are being depleted and the work of the trades is being done by unskilled men or semi-skilled machine specialists.

The trade unions have been waiting in vain for 25 years for the manual training schools to furnish recruits to the "depleted ranks" of skilled labour. It is time now to take steps to bring back the standard of efficiency. We want a system which will develop the labour power of our people so that every worker may become interested in his work and approach the limits of human efficiency. Our public school system of to-day teaches too much and educates not enough, and fails entirely to prepare its pupils for productive labour. It must be changed, and quickly, and the change must be radical. We can not add a few experiments in trade training in our larger cities or introduce intense manual training in manual training school departments to supplement a Latin and Greek curriculum. Our boys and girls must leave school thoroughly prepared by industrial training to do well some kind of productive work. A healthy community is impossible without the union of the schoolhouse, the home, and workshop. Modern life has not yet accommodated itself to the great revolution of our industrial system. Nothing but a thorough industrial education and understanding of economical interest of society can lead to the necessary union between labour and capital and give peace and prosperity to the present disturbed and suffering industrial world.

We believe that the education of workers in trade or industry is a public necessity, and that it should not be a private but a public function, conducted by the public and the expense involved at public cost.

We are opposed to the plan in operation in some places of having public instruction privately controlled. In such schools the boy receives his trade instruction only on sufferance of the manufacturer, and often he is surrounded by an atmosphere hostile to organization and expelled if suspected of union tendencies.

The State has provided schools to teach trades to the mentally, morally, and physically deficient; our corrective institutions, orphan asylums, and blind schools are equipped to teach useful occupations. By what right can we refuse the same chance for the

normal boy or girl? Would it not be more sage to engraft industry upon our public school system, and rather prevent pauperism, crime, and premature orphanage than to make them the bridge to industry? We think so, and we do not beg it as a favour, but we demand it as a right. The 90 per cent. who are going into manual occupations have the same right to the best preparation for their life's work that the State can give them as has the 10 per cent. who go into the professions.

Organized labour is concerned also with who the teachers in these schools shall be. Men who have had only theoretical training do not and can not make effective teachers of trades. We do not wish to be misunderstood, we do not belittle or underestimate the value of theoretical training, we regard it as necessary, but theory must be combined with practical experience. The potential workman must be brought in contact with the man who has actually done things and who knows how and why he did them. Who can not only build a machine, but having built it can make it go, can give that training of attention that is acquired in having to do things with a real motive behind and a real outcome ahead. And not only must the teachers be men and women of practical experience, but so also must those who are to direct them. It is hardly to be expected that the executive head of a trade school can successfully direct the activities of that school and dictate its policy if that person has only text-book acquaintance with the great industrial world. They, too, must be people who have actually come in personal contact with the problems for which they are trying to find a solution.

We are opposed to any system which turns out not machinists but machine specialists. Specialization in the industrial world is very different from professional specialization. Instead of being at the top of his trade, your machine specialist is at the bottom, if indeed he can be considered in the trade at all. He is a man who can do but one thing, and who knows little or nothing of the general principles of his trade. His whole efficiency is spelled "s-p-e-e-d."

We would protest, also, against those schools operated for profit, which advertise short cuts to the trades. They are turning out not even machine specialists, but are flooding the labour market with half-trained mechanics for the purpose of exploitation. There is a growing feeling which is gaining rapidly in strength, that the human element must be recognized, and can not be so disregarded as to make the future workmen either inefficients or mere automatic machines.

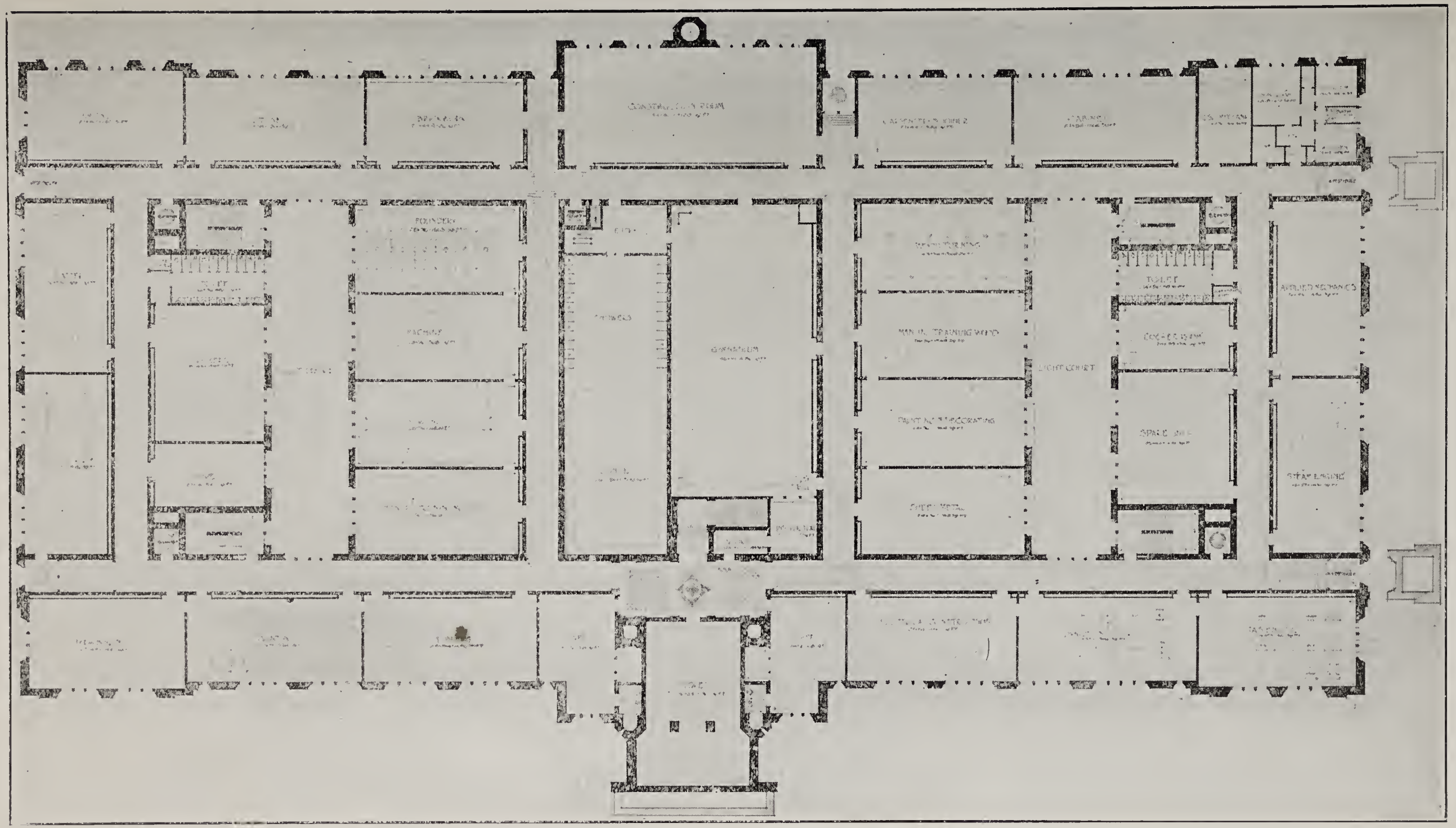
While we are willing to subscribe to any plan that offers efficient and practical instruction in productive operation, we do insist that emphasis must be placed upon education rather than upon product. The youth must not be exploited in the name of education. There must be the minimum of product and a maximum of education. In short, during the period of education it ought to be "construction for instruction, rather than instruction for construction."

One of the great troubles in America to-day is that too many of our wage earners are misfits industrially. It frequently happens that in the matter of selecting a vocation or trade the individual is consulted too little. His trade is selected for him because it seems to provide lucrative employment or because it was the trade of his father and not because there is anything in the work which appeals to him. He is summarily shot into a trade regardless of his adaptability to it; result, he goes through life a misfit and mediocre workman, not because he lacked ability, but because his energies were misdirected. We must have a system whereby the boys and girls of the country may have an opportunity to acquire educated hands and brains such as may enable them to earn a living in a self-selected trade or vocation and to acquire an intelligent understanding of the duties of good citizenship. The training for citizenship (the teaching of civics) is woefully neglected in practically all trade and vocational schools. The schools that are run for profit and the corporation schools say frankly, "Our business is to teach the trade, to turn out men who can do the work; beyond that we have no concern. Whether they can cast an intelligent vote or not does not interest us." Some of the philanthropic and public schools make a feeble attempt at teaching civics, but very few of them are getting anywhere. In most cases the human side is lost sight of. We want the boy (and girl) to be taught the fundamentals of civics, the meaning of government, and the reason that law must be obeyed. He must be taught what the result of ungoverned emotion or uncontrolled action of any kind may be. He must be made to realize that the boy of to-day is the voter of to-morrow and that he has obligations to society which he must discharge, and in order to discharge them he must be taught broader views of citizenship and ideals of right and clean living.

He should be taught something, too, of his own economic value. He must understand the value of collective bargaining and of how to adjust his relations with his employer. If our boys were instructed in such matters before they enter the competitive field there would be fewer labour disputes. We want men as well as mechanics.

PART II

The record for 1912 in Industrial, Technical, and Art Education



Proposed Industrial, Technical, and Art Schools, Toronto. (Ground Floor)

TORONTO

DAY AND EVENING INDUSTRIAL, TECHNICAL, AND ART SCHOOLS

Advisory Industrial Committee

Chairman: W. O. McTaggart, B. A.

MEMBERS OF THE SCHOOL BOARD

W. Dineen, Hatter and Furrier.
Jas. A. Ellis, Architect.
W. W. Hiltz, Contractor and Builder.
A. C. Lewis, Journalist, Secretary of Harbour Commission.
W. O. McTaggart, B.A., Real Estate, Builder.
John Noble, M.D., Physician.

APPOINTED MEMBERS

Geo. Brigden, Engraver and Lithographic Printer.
W. P. Cohoe, M.A., Industrial Chemist.
R. D. Fairbairn, Manufacturer of Fancy Dry Goods.
Wm. Glockling, Bookbinder.
J. Richards, Plumber.
R. J. Stevenson, Printer.

Staff

I. FULL-TIME TEACHERS

Principal: A. C. McKay.

B.A., LL.D., Toronto. Two years Public School. Two years High School. Two years Upper Canada College. One year Collegiate Institute. Twenty-one years McMaster University as Professor and Chancellor. Two years Technical School. Two years Building Construction and Metal Work. Salary, $5,000.

Asst. Principal and Evening Schools: Mechanical Drawing and Perspective: W. S. Kirkland.

M.A. Specialist in Science. Mechanical Drawing, School of Practical Science, Toronto. Machine Drawing, Mechanical Institute, Rochester. Machine Drawing, International Correspondence School. One and one-half years Public School. Seven years High School. Nine years Technical School. Six months in carpenter shop. Stationary Engineer. Salary, $2,500.

Asst. Principal and Day Schools: Mathematics: J. M. Warren.

Nine years High School. Nine years Technical High School. Salary, $2,500.

Machine Drawing and Design: C. N. Peake.

Twelve years Technical School. Two years shop practice in Reliance Electric Manufacturing Co., Waterford, Ont. Two years Electric Course in Thomson-Houston Electrical Co., Lynn, Mass. Two years Engine Design in Rankin Fritsch Co., St. Louis, Mo. Five years Marine Engine and Boiler Design in Bertrams' and Polsons', Toronto. One year Pump Design in Northey Pump Co., Toronto. Six months Granite City Steel Co., Granite City, Ill. Salary, $1,900.

Mathematics: Wm. H. Rutherford.

M.A., Toronto. Principal's Certificate. One year High School. Eight years Technical High School. Survey—Two years. Charge of Transit and Calculations. Salary, $1,950.

Mathematics, English, History: John A. Rundle.

High School Assistant. Eighteen and one-half years Public School. Eight years Technical High School. Has taken a course in Wood Working. Salary, $1,950.

Electricity and Applied Mechanics: J. W. McBean.
B.A., Toronto. One year Public School. Ten years Technical High School. Seven years Pattern-Making, Electrical Work and Drafting. Salary, $2,200.

Physics: W. P. Ferguson.
M.A., Queen's. Two years Fellow in University. One year High School. Two and one-half years Technical High School. Salary, $1,400.

Physics: W. C. Blackwood.
B.A.Sc., Toronto. Four years Public School. One-half year High School. Four years Technical Evening Classes. Five years Fellow Demonstrator in University. Two and one-half years Mechanical, Electrical and Civil Engineer. Salary, $1,400.

Shopwork in Wood and Metal: J. H. Cunningham.
First Class Certificate. Manual Training Specialist. Fifteen years Public School. One year Technical High School. Salary, $1,800.

Household Science: Miss M. M. Davidson.
Normal Professional Teacher, Pratt Institute. Five years Public School. One year Montreal School. Ten years Technical High School. Salary, $1,800.

Sewing, Knitting, Basketry: Miss M. A. DeLaporte.
Normal Technical, Mechanic Institute, Rochester. Columbia University, New York, Summer Course. Four years Settlement Work. Three years Technical Evening Work. Five years Technical Day Work. Salary, $1,100.

Cookery, Millinery, Textiles: Miss L. F. Sheffield.
Normal School, Macdonald Institute, Guelph. Columbia University, New York, special course. Five years Evening Work. One year Technical Day and Evening Work. Salary, $800.

Cookery, Bacteriology, Physiology: Miss A. M. Gray.
Normal. Lillian Massey. Columbia University, New York. Undergraduate. Nine years Public School. One year Lillian Massey. One year Technical Evening Work. Salary, $800.

Dressmaking: Miss M. Thompson.
Vocational Schools of Rochester, N.Y. Three years teaching at Girls' Club (Dressmaking), Birmingham, Eng. Eight years Head Fitter. Four years Practical Hand. Salary, $750.

Chemistry, Electroplating: W. J. Wilson.
B.A., Toronto. Eleven years in Technical High School. Experienced in consultation work in Industrial Chemistry. Salary, $2,050.

Chemistry, English, History: E. H. Jolliffe.
B.A., Toronto. Two and one-half years in High School. Five years in Technical High School. Five years in a commercial laboratory. Salary, $1,600.

English, History: A. E. MacLean.
B.A., Queens. Five years Public School. Eighteen and one-half years High School. Two years Technical High School. Salary, $1,600.

French, German: Miss H. E. Downey.
B.A., Toronto. Four years High School. Eight years Technical High School. Salary, $1,950.

II. PART-TIME TEACHERS AT ANNUAL SALARIES

Modelling and Wood Carving: J. L. Banks.
Sixteen years teaching experience. Four years Wood Carving. Four Years Terra Cotta Modelling. One year Drawing for Catalogue Work. Ten years Decorative Modelling and Designing, Interior and Exterior, Glass, Tile, Bronze, Textiles. Seventeeen years Sculpture and Figure Modelling. Salary, $1,400.

Industrial Design and Colour Work: Gustav Hahn.
Teacher's Certificate from Royal Industrial Art School, Stuttgart, Germany. Studied in Polytechnic of Stuttgart. Eight years Art School. Nine years Technical School. Two years Ornamental Designer. One-half year Furniture Designer. One year Designer Stained Glass and General Design. Twenty-two years Designer for Interior Decoration. Salary, $1,100.

Freehand and Charcoal Drawing: Emanuel Hahn.

Studied in Toronto Technical School, Toronto Art School, Royal Industrial Art School of Germany, the Academy and Polytechnic of Stuttgart, Germany. Five years Technical School. One year Ornamental Iron Design. Five years Monumental Design. Salary, $820.

Freehand, Charcoal and Mechanical Drawing: C. M. Maynard.

All Art Certificates of Ontario Art School. Studied in Art League of New York. Eight years Technical School. Nine years Designer for Interior Decoration, Elliott & Son, T. Eaton Co. Six months Designer for Silks and Textiles in Patterson, N.J. Salary, $950.

Architecture and Building Construction: C. S. Cobb.

B. Arch., M.Sc., Cornell. Architecture in large offices of New York, Albany, and Buffalo. Salary, $720.

III. PART-TIME TEACHERS AT $3.00 AN EVENING, EXCEPT WHERE OTHERWISE STATED

Freehand Drawing: E. J. Bengough.

B.A. Three years' teaching experience. Studied Art in New York and Philadelphia. Public Lecturer and Cartoonist.

Estimating and Quantity Surveying: W. Fraser.

Quantity Surveyor. Two years' teaching experience. Extensive experience in Scotland and Canada as Estimator, Quantity Surveyor and Clerk of Works.

Mechanical Drawing: H. J. Heinonen.

Fourth Year School of Practical Science. Graduate Toronto Technical High School. One year's teaching experience. One-half year Civil Engineering.

Mechanical Drawing: G. C. Keith.

M.Sc., Civil and Mechanical. Five years Machine Shop. One year Canadian Locomotive Co. Cost Office. Four months Gas Engine Design. Five years on Technical Journals.

Mechanical Drawing: R. J. Marshall.

B.A.Sc. Three years' teaching experience. One year Township Survey. One-half year Railway Construction. Seven months Concrete Inspecting. Six months Hydro-Electric. Six months Bridge Design.

Mechanical Drawing: M. Pequegnat.

B.A.Sc., O.L.S., D.L.S. Two years' teaching experience. Three and one-half years Municipal Engineering. Six months Government Survey.

Mechanical Drawing: J. W. Melson.

B.A.Sc. Two years' teaching experience. Two years Government Survey. Six months Government Map Drawing. One year Electrical Machine Shop.

Mechanical Drawing: J. H. Parkin.

B.A.Sc. One year Machine Shop. Six months Drafting Office. Four months Surveying.

Mechanical Drawing: G. C. Parker.

B.A.Sc. Four months Telephone Engineering. Six Months Machine Shop. Five months Civil Engineering. Five months Electrical Construction. One year General Engineering. Six months on Technical Journals.

Freehand Drawing: L. Rossell.

Graduate of South Kensington Art School. Ten years Designer for Engraving Houses and Lithography.

Painting and Decorating: A. V. Wiggins.

One year's teaching experience. In Painting and Decorating trades in England, Paris, and Canada.

Printing: W. H. Handley.

Served many years in printing trade. Foreman of Moore Bros., Printers, Toronto.

Office Practice: F. W. Coyne.
Two years' teaching experience. Ten years in Banking Business.

English, Arithmetic, Writing: W. C. McKendry.
B.A. Public School Teacher. Three years' teaching experience.

Clay Modelling and Wood Carving: W. P. Bruce.
Professional Wood Carver and Modeller.

Manual Training: Jas. Slaughter.
First Professional Certificate. Public School Teacher. Twenty-two years' teaching experience. Three years Practical Builder.

Sign Painting: J. W. Cox.
Two years' teaching experience. Practical Sign Painter for several years by profession.

Mathematics: W. M. Brock.
B.A.Sc., Toronto. Four years Public School. One-half year Business College. Demonstrator in Drafting, School of Practical Science. Surveying and Drafting. C.N.R. three years. C.P.R. two years.

Surveying, Applied Mathematics: E. W. Banting.
B.A.Sc., Toronto. Six years Demonstrator in Survey, School of Practical Science. Mining and Surveying.

Mathematics: S. Kennedy.
B.A.Sc., Toronto. Six months Public School. Two years Demonstrator in Physics, University of Toronto.

Mathematics: A. Thomson.
MA., Toronto. Demonstrator in Physics, University of Toronto. Post-Graduate in Physics, Radio-activity, original research work.

Mathematics: J. A. Macdonald.
B.A.Sc., Toronto. Demonstrator in Surveying, School of Practical Science. One year Public School. Surveying, two years. Drafting, Walkerville Steel Co., one year. Reinforced Concrete Contractor, one year.

Mathematics: Wm. R. Key.
B.A.Sc., Toronto. One year Technical High School. In charge of Structural Iron Work and Road Work Drafting, and of Brick Making Machinery.

Mathematics: C. D. McClenehan.
B.A., Toronto. Three years Public School.

Physics: W. P. Dobson.
B.A.Sc. Three years Public School. Three and one-half years Technical Evening Classes. Three years Electrical Work and Drafting.

Physics: L. T. Rutledge.
B.A.Sc. Three and one-half years Public School. Two and one-half years Technical High School Evening. Two and one-half years Demonstrator in University. Four years Mechanical, Electrical, and Civil Engineering.

Physics: W. J. Smithers.
B.A.Sc. Three years Public School. One and one-half years Demonstrator in University. Five and one-half years Electrical and other Engineering Work.

Steam Engine: M. L. Smith.
B.A.Sc. Fifteen years Machine Shop, Tool Room, and Engine Running experience.

Physics: G. K. Williams.
B.A.Sc. Two years Drafting and Shop.

Cabinet Making: R. Ferguson.
Certificate in Woodwork from Stirling Technical Institute. Two years Pupil Teacher in Stirling. Twelve years at cabinet-making.

Carpentry: G. Morton.
One and one-half years Technical High School, Evening Instructor. Fifteen years at Carpentry, including six years at Stair-builder and Foreman.

Electricity: J. R. Moore.
M.A. Fourteen Years in Public School and High School.

Electricity: W. R. Saunders.
B.A. Seventeen years in Public School and High School.

Cookery: Miss L. E. Bailey.
Normal. Macdonald Institute, Guelph. Two years Halifax Ladies' College.

Cookery: Miss M. J. Govenlock.
Normal. Lillian Massey. One year Lillian Massey. Three and one-half years Mount Allison, N.B., Institute Work.

Cookery: Miss I. J. C. Pease:
Normal School. Macdonald Institute, Guelph. Four years Collegiate Institute, Stratford. Two years Evening Work.

Cookery: Miss M. Powell.
Normal. Macdonald Institute, Guelph. Four years, chiefly Institutional, in Hospitals.

Cookery: Miss H. McMurchie.
B.A., Toronto. Normal School. Macdonald Institute, Guelph. Five years, chiefly Institute Work.

Millinery: Miss E. S. Cole.
Normal. Two years Technical School. Summer Session, Columbia University, New York. One year at Lillian Massey School. Five years' Evening Work, Technical School.

Home Nursing, Hygiene: Miss R. G. D. Hume.
M.D., Trinity University. Five years Lecturer in Bacteriology. Two years Technical School, Evening Work.

Sewing: Miss E. DeLaporte.
Kindergarten training. Two Summer Sessions Columbia University, New York. Ten years Kindergarten. Four years Evening Work, Technical School.

Costume Designing: Mrs. T. Craig.
Fifteen years Dressmaker. Dressmaking Designer.

Embroidery: Miss F. Shanly.
Five years Evening Work, Technical. Two years Belding Paul Co.

Millinery: Miss G. M. Williams.
Five years Millinery Shop. Two years Wholesale Millinery. Salary, $2.00 an evening.

Costume Designing: Miss M. Catterick.
Five years Wholesale Dressmaking and Designing. Salary, $2.00 an evening.

Dressmaking: Miss J. G. Burnet.
Seven years practical work in Wholesale Dressmaking.

Dressmaking: Miss L. Hughson.
Five years Head of Establishment. Six years Manager Ladies' Tailoring Firm. Manager of her own business of Dressmaking.

Chemistry: H. A. Willoughby.
B.A., Toronto. Two years Demonstrator in University.

Geology: A. E. Allin.
B.A., Toronto. Two years Demonstrator in University. Several seasons in Field Work in Geology.

Civics: Jas. Ballantyne.
Graduate of Ruskin College, Oxford. Several years as machinist in Scotland.

Modelling and Casting: F. Simpson.
Graduate in Modelling of Technical High School, Toronto. Three years Commercial Modelling and Casting. Salary, $4.00 a day.

Architecture and Building Construction: Alex. S. Carter.
Licentiate R.I.B.A. Ten years' experience in Architectural Design in London, England. Salary, $2.00 an evening.

PRINCIPAL'S REPORT

Establishment of Classes

In November, 1911, the Advisory Industrial Committee of the Board of Education of Toronto, acting under *The Industrial Education Act,* adopted the scheme of reorganization and development, presented in the following resolutions:—

"1. That the work of Technical and Industrial education should be developed in a Central Technical School and in Branch Technical Schools.

"2. That in each of these schools courses should be arranged for both Day and Evening Classes.

CENTRAL SCHOOL

"3. That in the Central School there should be organized the following courses:

I. Day School

"(1) Industrial Courses (*General and Special*), extending over four years for boys, and over three years for girls; one half of the time in the last two years in each course to be devoted to actual shop practice.

"Pupils to be admitted to these courses are required to present a certificate of having obtained at least Fourth Form standing in a Public or Separate School.

"(2) Matriculation Courses, extending over four years, admitting to University Departments of Applied Science and Household Science.

"Pupils to be admitted to these courses are required to be duly qualified to enter a High School.

"(3) Special Short Courses of theoretical and practical technology, including courses for part-time students.

"Pupils to be admitted at the discretion of the Principal.

"(4) Courses in Fine and Applied Arts, with special adaptation to the industries.

"Pupils to be admitted at the discretion of the Principal.

II. Evening School

"(1) Industrial Courses, with practical demonstrations under the direction of skilled workmen, open only to those actually engaged in the trade or occupation.

"(2) Technical Courses, including theoretical and applied mathematics.

"(3) Art Courses, with special adaptation to industries.

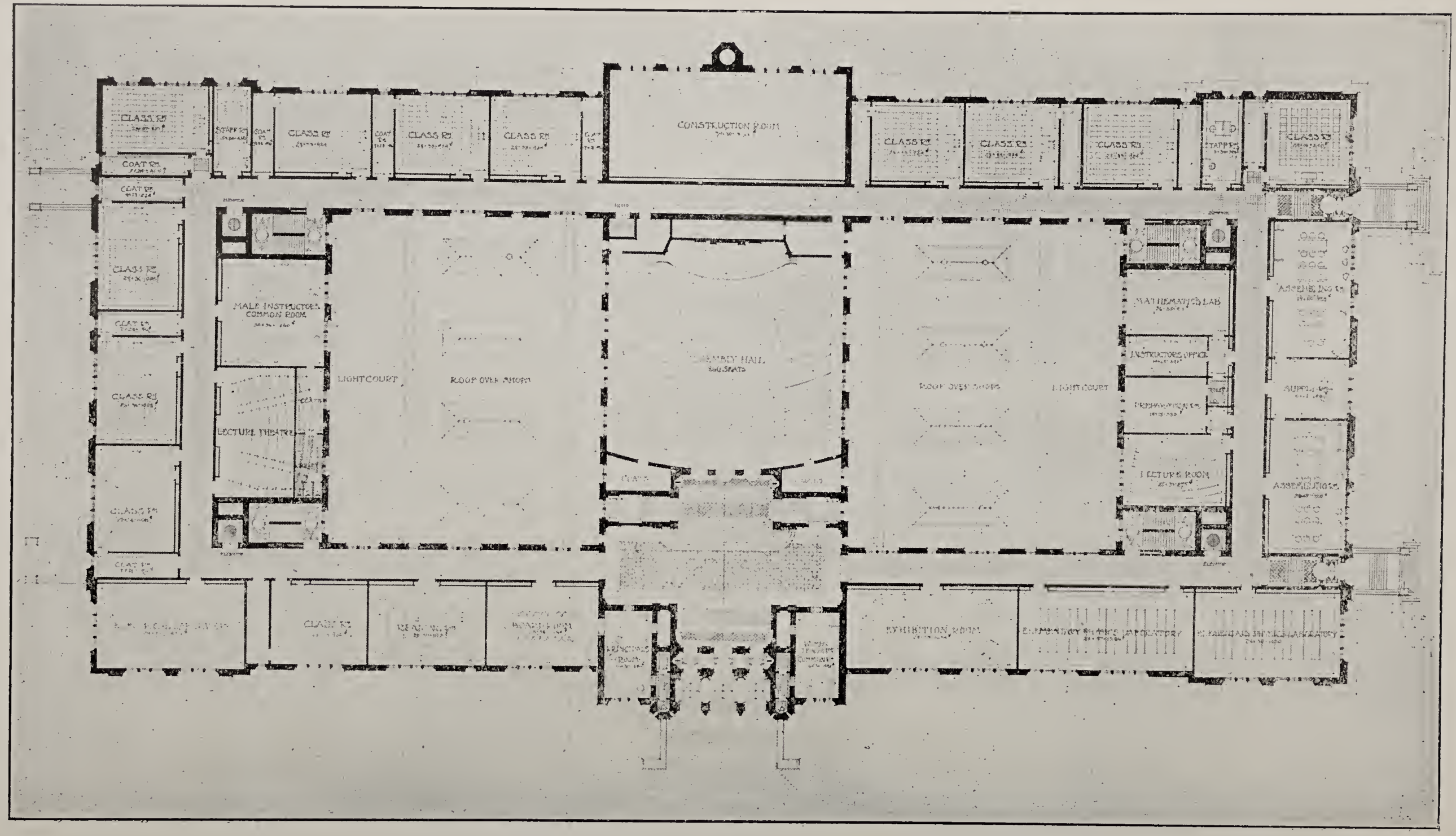
"(4) Domestic Science Courses.

BRANCH SCHOOLS

"4. That each Branch School should be organized to provide:

I. Day School

"(*a*) For boys, the work of the first and second years of the Technical and Industrial courses for boys of the Central School, and such practical art and trade work of the third year as may be conveniently provided.



Proposed Industrial, Technical, and Art Schools, Toronto, (First Floor Plan)

"(*b*) For girls, the work of the first year of the Technical and Industrial courses for girls of the Central School, and such practical art and trade work of the second year as may be conveniently provided.

II. Evening School

"The first year courses in Mathematics, Physics, Industrial Art, Chemistry, and Household Science, which are offered in the Central School to Evening Classes.

"5. That the work of the Branch Schools should be under the direction and supervision of the Principal and Directors of the Central School."

Branch Evening Schools were opened in January, 1912, in the Humberside Collegiate Institute and in the Riverdale High School. A Junior Branch Evening School for boys under eighteen years of age was opened on October 21st, 1912, in the George Street Public School.

Day School in Central School

Day Classes are conducted at present in the Central Technical School only. The Courses for Day Pupils which have been organized are:

I. MATRICULATION COURSE

The Matriculation Course of Four Years, for students preparing for the Matriculation Examination admitting to the Faculty of Applied Science of the University of Toronto, and of Queen's University, Kingston.

High School entrance standing is required for admission.

The subjects of the course and the number of periods a week (there are 40 periods in a week) devoted to each subject are:

First Year (*Tuition, Free*)

Physics 3, Chemistry 3, Arithmetic and Mensuration 3, Algebra 3, Geometry 3, English Literature 2, English Composition 2, English Grammar 2, Canadian History 2, Geography 1, French 3, Mechanical Drawing 4, Freehand Drawing 2, Shopwork 3, Gymnastics 4. Registered attendance, 40 students.

Second Year (*Tuition, Nine Dollars*)

Physics 3, Arithmetic and Mensuration 3, Algebra 3, Geometry 3, English Literature 2, English Composition 2, English Grammar 2, Civics, English History and Geography 3, French 4, German 3, Mechanical Drawing 4, Freehand Drawing 2, Shop Work (Machine Pattern Making, Lathe Work, Vise Work 4, Gymnastics 2. Registered attendance, 40 students.

Third Year (*Tuition, Fifteen Dollars*)

Physics 4, Chemistry 4, Algebra 3, Geometry 3, Trigonometry 2, English Literature 2, English Composition 2, English Grammar 2, English History 3, French 3, German 4, Mechanical Drawing 4, Freehand Drawing 2, Gymnastics 2. Registered attendance, 23 students.

Fourth Year (*Tuition, Twenty-one Dollars*)

Physics 5, Chemistry 4, Algebra 4, Geometry 4, Trigonometry 3, English Literature 3, English Composition 2, History (Canada, England, Rome, and Greece) and Geography 5, French 4, German 4, Gymnastics 2. Registered attendance, 22 students.

Total attendance in Matriculation Course, 125 students.

II. INDUSTRIAL COURSE FOR BOYS

The Industrial Course of Four Years for boys, preparing for the pursuits of industrial and commercial life.

Boys are admitted to the Course who have attained Fourth Form standing in a Public or Separate School.

First Year (*Tuition, Free*)

Arithmetic and Mensuration 4, Algebra 3, Geometry 3, Physics 5, Chemistry 5, Mechanical Drawing 4, Freehand Drawing 2, Shopwork 6, English (Literature, Composition, Grammar) 3, History and Geography 3, Gymnastics 2. Registered attendance, 80 students.

Second Year (*Tuition, Free*)

Arithmetic and Mensuration 2, Algebra 2, Geometry 2, Trigonometry 2, Physics 6, Chemistry 6, Mechanical Drawing 8, Freehand Drawing 2, Shop Work (Pattern Making, Lathe Work, Vise Work, Building Construction, Hammered Copper and Brass Work) 6, English (Composition, Grammar, History) 2, Gymnastics 2. Registered attendance, 16 students.

Third and Fourth Years (*Tuition, Free*)

The work of these years, which can be given only with the larger equipment proposed for the new Central Technical School, will be specialized and will provide definite training in various trades and callings. The student will spend at least one half of his time at the school on the practical work of the trade or profession which he has chosen.

The work in Science (Physics and Chemistry), Mathematics, Drawing, English and Civics will be correlated with this practical work, and will have a very intimate and direct relation to it.

With the present staff and equipment, instruction is offered to students in the following subjects:

Applied Mechanics and Strength of Metals, with shop work for Structural Workers and Architectural Draftsmen.

Electricity, Direct and Alternate current machinery with Laboratory work for Electrical Workers.

Heat, Theory of Steam Engine, with demonstrations and practical work for Engineers.

Electro-Chemistry, with definite instruction in electroplating, electrotyping, refining, smelting, and preparation of commercial chemicals, for Industrial Chemists.

Architecture and Building Construction, Perspective Drawing, Freehand Drawing, Modelling, Estimating, for Architectural Draftsmen and others proposing to connect themselves with the Building and Machine trades.

English, Composition, hand lettering in various types, spacing, mathematics, methods of estimating and pricing work for those intending to enter the Printing trade.

Drawing, Freehand and Geometrical, Designing, preparation of working drawings, together with practical work for those intending to enter the Painting and Decorating trade.

Registered attendance, 6 students. Total attendance in Industrial Course, 102 students.

III. ART COURSES

The Course in Fine and Applied Art of Three Years is intended to give a thorough preparation along art lines for those who desire to follow the work from the pure art standpoint, and especially for those who wish to use it for industrial purposes. For those who desire to secure positions in the art departments of any of the industries, such as engraving, lithographing, publishing, illustrating, advertising, decorating, manufacture of ornamental iron work, designing of jewellery, etc., this course provides the necessary preparation. The regular course is arranged for three years, but students who wish to continue the work, and further specialize along some one particular line may do so. Pupils are admitted at the discretion of the Principal. Those who have completed two years of an Industrial Course may enter upon the second year of this course by taking such portions of the first year's work as may not have been covered in the Industrial Course.

First Year (*Tuition, Free*)

Freehand Drawing 7, Mechanical Drawing 4, Lettering 2, Colour 4, History of Art 2, Art Composition 2, Clay Modelling 7, English (Composition, Literature) 4, French 3, Arithmetic 3, Gymnastics 2. Registered attendance, 10 students.

Second Year (*Tuition, Free*)

Freehand Drawing 4, Mechanical Drawing 4, Lettering 2, Colour 4, History of Art 2, Black-board Drawing 2, Art Composition 2, Perspective 4, Industrial Design 2, Modelling in Clay, Wood Carving 6, English (Composition, Literature) 3, French 3, Gymnastics 2. Registered attendance, 3 students.

Third Year (*Tuition, Free*)

Freehand Drawing 2, Mechanical Drawing 4, Lettering 2, Colour 4, History of Art 2, Drawing on the Black-board 2, Art Composition 2, Perspective 4, Industrial Design and Painting 6, Clay Modelling and Wood Carving 6, English (Composition, Literature) 3, French 3. Registered attendance, 2 students.

Total attendance in Art Course, 15 students.

IV. HOME ECONOMICS COURSE

The Home Economics Course of Three Years for girls and young women. This course provides training in Home Economics for girls and young women who wish to become more proficient in home activities, and at the same time includes all the essentials of a good English education. Pupils are admitted to this course who have attained Fourth Form standing in a Public or Separate School.

First Year (*Tuition, Free*)

Household Science (Cookery, Household Economics, Handicrafts, Basketry, Knitting and Crocheting, Hand Sewing, Textiles) 12, Anatomy and Physiology 2, Physics 3, Chemistry 2, Laboratory Work 2, English (Literature, Composition, Grammar) 6, Canadian History and Geography 3, Arithmetic 3, Freehand Drawing 4, French 3. Registered attendance, 35 students.

SECOND YEAR (*Tuition, Nine Dollars*)

Household Science (Cookery, Dietetics, Bacteriology, Hygiene, Home Nursing and Emergencies, Marketing, Laundry, Sewing, Millinery, Textiles) 16, Anatomy and Physiology 1, Chemistry 5, English (Composition, Grammar, Literature) 5, History 2, Freehand Drawing 4, Modelling 2, French 3, Arithmetic 2. Registered attendance, 13 students.

THIRD YEAR (*Tuition, Fifteen Dollars*)

Household Science (Cookery, Hygiene, Bacteriology, Sewing, Millinery, Embroidery) 20, Anatomy and Physiology 2, Chemistry—study of alcohols, fats, starch, glucose, cane sugar, maltose, lactose, proteids, milk, flour, meat, nuts, 5, English (Composition, Literature and Civics) 5, Freehand Drawing 2, Modelling 3, French 3. Registered attendance, 6 students.

Total attendance in Home Economics Course, 54 students.

V. INDUSTRIAL COURSE FOR GIRLS

The Industrial Course of Three Years for girls. This course is planned to provide training for girls who wish to prepare themselves for such occupations as that of dressmaking, machine operating, millinery, costume designing, industrial designing, catering, cookery for private homes, cookery for public dining-rooms or cookery for hospital patients.

The work of the first year is general in character, but that of the second and third years is specialized to meet the needs of the individual student.

Girls are admitted to the classes who have Fourth Form standing in a Public or Separate School.

FIRST YEAR (*Tuition, Free*)

Household Science (Household Economics, Hand Sewing, Machine Sewing, Textiles) 18, Physics 3, Chemistry 4, Arithmetic and Mensuration 3, English (Composition, Grammar, Geography, Literature) 8, Freehand Drawing 4. Registered attendance, 13 students.

SECOND AND THIRD YEARS (*Tuition, Free*)

Freehand Drawing.—The work of the second and third years of this course is framed so as to bring it into the closest harmony with the aims of the student. The creative and design faculties are guided so as to secure the closest possible application of the development secured in drawing and design and colour harmony, to the special line of industry chosen. The student is led to appreciate the value of art and its application to whatever work she may intend to follow.

Cookery.—Classifications; meats and vegetables and accompanying sauces; soups and soup garnishes, salads, dressings, desserts, left-overs, etc.; table service; invalid cookery; serving luncheons.

Hygiene.—Care of the body; lighting, heating, ventilating, plumbing of the house. Municipal and state sanitation; transmissible diseases; disinfecting and disinfectants.

Sewing.—Dressmaking, drafting, cutting, fitting, making shirtwaists; shirtwaist suit, simple dress, designing, making dress; application of trimmings, lace, etc.

Millinery.—Drafting, making buckram shapes from draft; making wire shapes, covering with silk, velvet, straw; trimmings, finishing, colour, making hats, making trimmings, textiles.

Textiles.—A detailed study of the distribution, growth, preparation, processes, marketing and manufacture of the leading textile fibres, cotton, wool, linen, silk. Simple tests for the identification of these fibres either as adulterants or in their proper uses. A special study of fabrics and their uses, with continued work on other textile fibres. Relative cost of materials. Practical work in choice of materials. English.

Composition, History, and Grammar.

VI. SPECIAL PART-TIME INDUSTRIAL COURSES

In the Special Part-time Industrial Courses the tuition is free except where stated. When the shops and laboratories in the new Central Technical School are ready for occupation, it is expected that part-time work will be offered in many trades for the apprentices learning these trades. In the meantime the following courses are offered, and students are admitted as far as the present accommodation permits.

Architectural Drawing

The aim of this course is to prepare students to make and read rapidly working drawings of plans and elevations of buildings and details of building construction. The work will be found of special advantage to those engaged in any phase of building construction and who can find time to attend these classes during slack seasons in the building trades. Registered attendance, 6 students.

Machine Drawing

The work of this course includes principles underlying machine drawing, such as geometrical constructions, or orthographic projections, standards used in shop work, dimensioning, drawing of machine parts to a scale, detail and assembly drawings, sketching and lettering. The course is planned for those engaged in the machine trades and those desiring to prepare themselves to become mechanical draftsmen. Registered attendance, 3 students.

Sheet Metal Drafting

This course bears the same relation to those engaged in sheet metal work as the machine drawing course, stated above, bears to the machinist. The work includes the preparation of working drawings, plans and elevations, the development of surfaces and formation of sheet metal patterns, intersections, lettering, and dimensioning.

Art and Design

Those who may not have the time to take up the full work of the regular Art course may take any branch or branches of that work for which they have the necessary preliminary training, such as Freehand Drawing, Lettering, Mechanical Drawing, Colour, History of Art, Art Composition, Black-board Drawing, Perspective, Industrial Design along any special line, Modelling and Wood Carving. Registered attendance, 36 students.

Modelling in Clay

The work in this subject may be taken up independently of other courses, to prepare students either along pure art lines or for industrial purposes, such as in ornamental decorative work for buildings, designs for silverware, pottery, etc. Registered attendance, 23 students.

Printing

Special students are allowed to take such sections of the work assigned for the printing trades as their qualifications will permit them to follow profitably, such as special work in composition, proof-reading and proofing, estimating, making ready, imposition and press work, etc.

Painting and Decorating

Short courses are offered in those branches of the work for which the student has had the necessary preliminary training, such as: colour work, properties of materials used, impurities likely to be found, period styles, plain painting, varnishing, enamelling, graining, marbling, stencilling, wood finishing, paper-hanging and ornamental painting, etc.

Carpentry and Building Construction

Practical work for young men engaged in the trade as journeymen or apprentices, is offered, including such work as laying out and constructing of newels, hand-rails, strings, risers and treads for stairs, laying out and cutting rafters, hardwood finishing, construction of a complete staircase or other problem. Work in drafting and making out bills of stuff is also required in connection with the course. Strength of Materials (a knowledge of Elementary Algebra is required for this course): Elasticity and ultimate strength of materials, riveted joints, bending moments and shearing forces in beams, use of the moment of inertia in calculating the strength and deflection of beams and columns, stresses in derricks and in roof and bridge trusses.

Electrical Testing

(A knowledge of Elementary Mathematics and Elementary Electricity is required for this course.) Measurements and calculations of losses, efficiency and brake, horse-power of dynamos and motors; of magnetic flux and leakage; of candle-power and efficiency of lamps; testing for crosses, grounds and open circuits in lines and armatures, etc. Registered attendance, 6 students.

Mineralogy

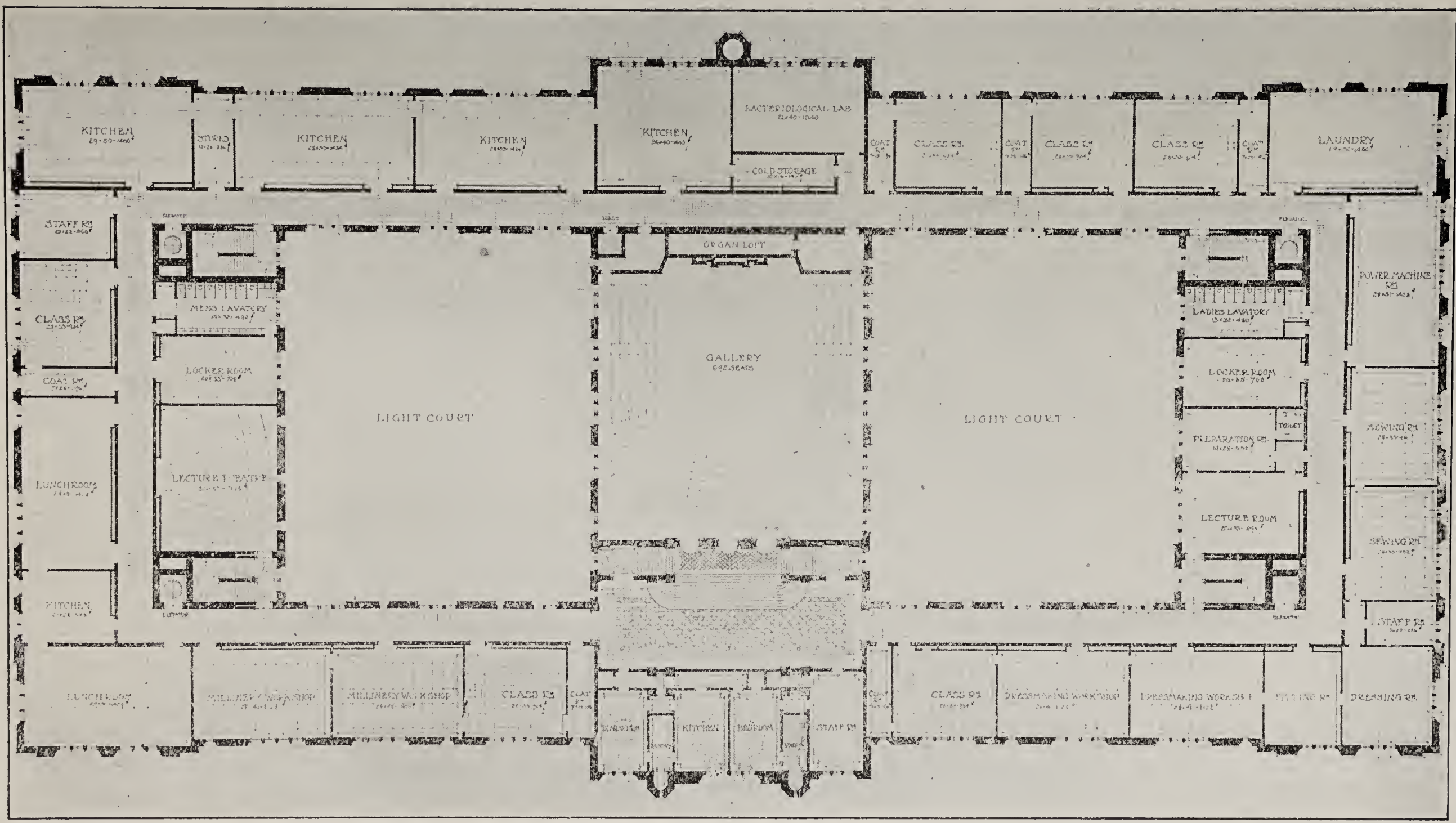
1. Elementary chemistry; substances, elementary or compound; mechanical mixtures, solutions and chemical compounds; study of oxygen and hydrogen and their compounds; nomenclature of compounds of two elements; acids, bases and salts, with their nomenclature.

2. Descriptive Mineralogy: Physical properties of minerals, as colour, lustre, streak, hardness, fusibility, etc.; description of the principal minerals, with their occurrence and economic uses; how minerals occur.

3. Determinative Mineralogy: Practical study in the laboratory of the physical constants of minerals; determination of the constituents of minerals by means of blow-pipe, etc.; determination of minerals by means of mineral tables; study of minerals and common rocks by handling and inspection, with a view to recognition by sight.

Practical Surveying

Testing chains; practice in chaining over even and uneven grounds; making a survey of a piece of ground with the chain to locate roads, sidewalks, fences, buildings, and other topographical features; the keeping of field notes



Proposed Industrial, Technical, and Art Schools, Toronto (Second Floor Plan)

in proper form; practice with the surveyor's compass; making a survey of a closed figure with the chain and compass; plotting the survey in the drafting room; the mathematics necessary to an understanding of the work. The elements of Astronomy, including a study of the celestial sphere, the solar system, time, eclipses.

Cookery

These courses are planned for those who cannot spend the time required to take a regular course, or for those who feel the need of a special phase of cookery. They provide training chiefly in practical work. Fee: $2.00 a term for one lesson a week; $5.00 a term for three lessons a week, and $1.00 for each subsequent one.

(1) Flour mixtures. (2) Soups, salads, entrees. (3) Desserts. (4) Luncheons and Suppers; the course includes the using up of left-overs. (5) Meats and vegetables, with accompanying sauces and gravies; the course includes the use of the Fireless Cooker. (6) Invalid Cookery, including the consideration of diets for special diseases. (7) Table service, including the making of menus, estimating the cost, and the nutritive values. Registered attendance, 20 students.

Sewing

The students supply their own material, excepting in some of the dressmaking classes.

1. Hand sewing.—The various stitches applied in the making of useful articles.

2. Machine sewing.—Lessons in the use and care of the sewing-machine and all its attachments. The making of undergarments.

3. Shirtwaists.—Proficiency in hand and machine sewing required. Drafting, cutting and fitting, or cutting from pattern and fitting of shirtwaists.

4. Dressmaking.—Drafting; cutting; fitting; making simple dresses.

5. Millinery.—Drafting hats; making buckram shapes; making wire shapes; covering with silk, velvet and straw; finishing; trimming; making trimmings.

Registered attendance, 102 students.

Preliminary Training for Nurses

Fee, $12 for the course.

This course is designed to meet the needs of the young woman who wishes to enter a hospital for training, and especially for those whose education having been interrupted, now needs supplementing. The work is carried on in co-operation with the hospitals of the city, the preference being given in some of the hospitals to applicants who have taken the course. As far as the equipment of the school will allow, the work is planned along the lines of the preliminary training given at some of the best hospitals on the continent.

The course extends over four months, from September to Christmas, and again from January to April, and includes:—

1. Cookery. 2. Anatomy and Physiology. 3. Bacteriology. 4. Chemistry. 5. Hygiene. 6. Dietetics, 7. Household Economics. Registered attendance, 9 students.

Housekeeper's Course

(Four months, from September to Christmas, and again from January to April) Fee, $10 for the course.

This course affords opportunity for training in the subjects which specially concern the home-maker. The work is planned for a four months' course, and should enable the student to meet intelligently the demands of the modern home.

1. Cookery. 2. Household Economics. 3. Hygiene. 4. Marketing. 5. Bacteriology. 6. Home Nursing and Emergencies. 7. Dietetics. 8. Laundry. 9. Sewing. Registered attendance, 6 students.

Total attendance in Part-time Courses, 197 students.

Total registration in Day Classes, 490 students.

Evening Classes

The Evening Classes provide scientific, artistic, and practical training for apprentices, journeymen, foremen, clerks, salesmen and others, who are engaged in industrial or commercial pursuits during the day time, and who desire supplementary instruction in the application of science and art to the trades, manufactures, and other occupations. While regular courses are defined for the students of the Evening Classes, no restrictions are enforced. Each student is permitted to select those subjects which will best help him to make progress in his particular trade or business.

The Session commences on the 1st October and closes on March 31st.

The classes, with few exceptions, meet twice a week, from 7.30 to 9.30 p.m., and in nearly every case the whole evening session (nearly two hours) is given to the one subject. The exceptions are the classes in Cookery, Sewing, and Millinery, which owing to the great number of registrations and the limited accommodations meet only once a week. One evening class in Trade Dressmaking meets twice a week.

Applicants for registration in the Evening Class must be at least fifteen years of age, except under special circumstances. The Principal may admit applicants under fifteen, provided that such applicants are deemed capable of profiting by the work of the classes.

A deposit of $2 is required from each student; this deposit is refunded to such students as attend eighty-five per cent. of the lessons of their respective classes, reckoning from the date of entering.

DIPLOMA COURSES

The student is free to select any subject which he is qualified to take. He is recommended, however, to consider one of the following Diploma Courses, in which the year courses are arranged in the order in which it is advisable to take up the work.

Architecture and Building Construction

Architecture I, Freehand Drawing I, Architecture II, Mathematics I, Architecture III, Mathematics II, Perspective, Estimating, Applied Mechanics and Strength of Materials.

Machine Drawing and Design

Machine Drawing I, Mathematics I, Machine Drawing II, Freehand I and Machine Sketching, Mathematics II, Machine Drawing III, Applied Mechanics and Strength of Materials.

Industrial Design and Art

Freehand Drawing I, Geometrical Drawing, Freehand Drawing II, History of Ornament, Industrial Design I, Modelling in Clay I, Industrial Design II, Modelling in Clay II or Wood Carving I.

Electricity and Magnetism

Mathematics I (Arithmetic, Algebra), Electricity II, Electricity III, Mathematics IIA, Electricity IV, Electricity V.

Chemistry

Chemistry I, Chemistry II, Mathematics I (Arithmetic and Algebra), Chemistry III, Electricity I, Chemistry IV.

Mineralogy and Geology

Chemistry I, Geology I, II, III, Mineralogy I, II, II.

Mathematics

Mathematics I, Mathematics II, Mathematics III, Applied Mechanics and Strength of Materials or Actuarial Science.

Sewing

Sewing I, Sewing II, Sewing III, Millinery I, Millinery II or Embroidery.

Cookery

Cookery I, Household Economics, Cookery II, Home Nursing and Emergencies, Cookery III, Hygiene.

Sewing and Cookery

Cookery I, Cookery II, Sewing I, Sewing II, and any two of: Household Economics, Sewing III, Millinery I, Millinery II, Embroidery I, Embroidery II.

Attendance

Nov. 1st, 1912

AT CENTRAL SCHOOL

Following is the list of organized courses for Evening Classes, together with the registered attendance in each class:—

Architecture I.	78
Architecture II.	38
Architecture III.	16
Estimating I.	12
Estimating II.	6
Machine Drawing I.	49
Machine Drawing II.	22
Machine Drawing III.	7
Perspective	..
Freehand Drawing I.	92
Freehand Drawing II.	27
Industrial Design I. } Industrial Design II. }	31
Geometrical Drawing	..
History of Ornament	13

Modelling I. / Modelling II.	29
Wood Carving	7
Electricity I.	136
Electricity II.	36
Electricity III.	12
Electricity IV.	..
Electricity V.	..
Steam Engine	22
Applied Mechanics and Strength of Materials	9
Chemistry I.	32
Chemistry II.	9
Chemistry III.	10
Chemistry IV.	6
Geology I.	9
Mineralogy I.	9
Geology II.	..
Mineralogy II.	..
Geology and Mineralogy III.	..
Short Course in Mineralogy	..
Mathematics I. (Arithmetic, Mensuration, Algebra, Geometry)	235
Mathematics II. (Mensuration, Algebra, Geometry, Applied Mathematics) / Mathematics II. A.—For Students in Electricity	44
Mathematics III. (Mensuration, Algebra, Trigonometry, Applied Mathematics, Actuarial Science)	19
Surveying	15
Cookery I.	311
Cookery II.	87
Cookery III.	43
Cookery IV.	26
Dietetics	..
Household Economics	63
Home Nursing and Emergencies	96
Hygiene	9
Sewing I. Hand Sewing	89
Sewing II. Machine Sewing	52
Sewing III. Cutting and making shirtwaist suits	80
Sewing IV. Dressmaking	90
Costume Designing	61
Millinery I.	120
Millinery II.	23
Embroidery I.	48
Embroidery II.	14

Following is the list of Trade Classes, restricted to those actually engaged in the trade:

Painting and Decorating	16
Printing	43
Carpentry and Building Construction	33
Cabinet-making	3
Electroplating	21

AT HUMBERSIDE AND RIVERDALE BRANCH SCHOOLS

Freehand Drawing	9
Architecture and Building Construction	35
Plumbers' Drafting / Sheet Metal Drafting / Machine Drawing	23
Arithmetic / Algebra / Geometry	56
Electricity	29

AT JUNIOR BRANCH INDUSTRIAL SCHOOL, GEORGE STREET

The work of the classes in the Branch Schools corresponds to that of the first year of the Central School. Persons who complete satisfactorily the work of any of these classes are granted certificates entitling them to enter the second year classes in the Central School.

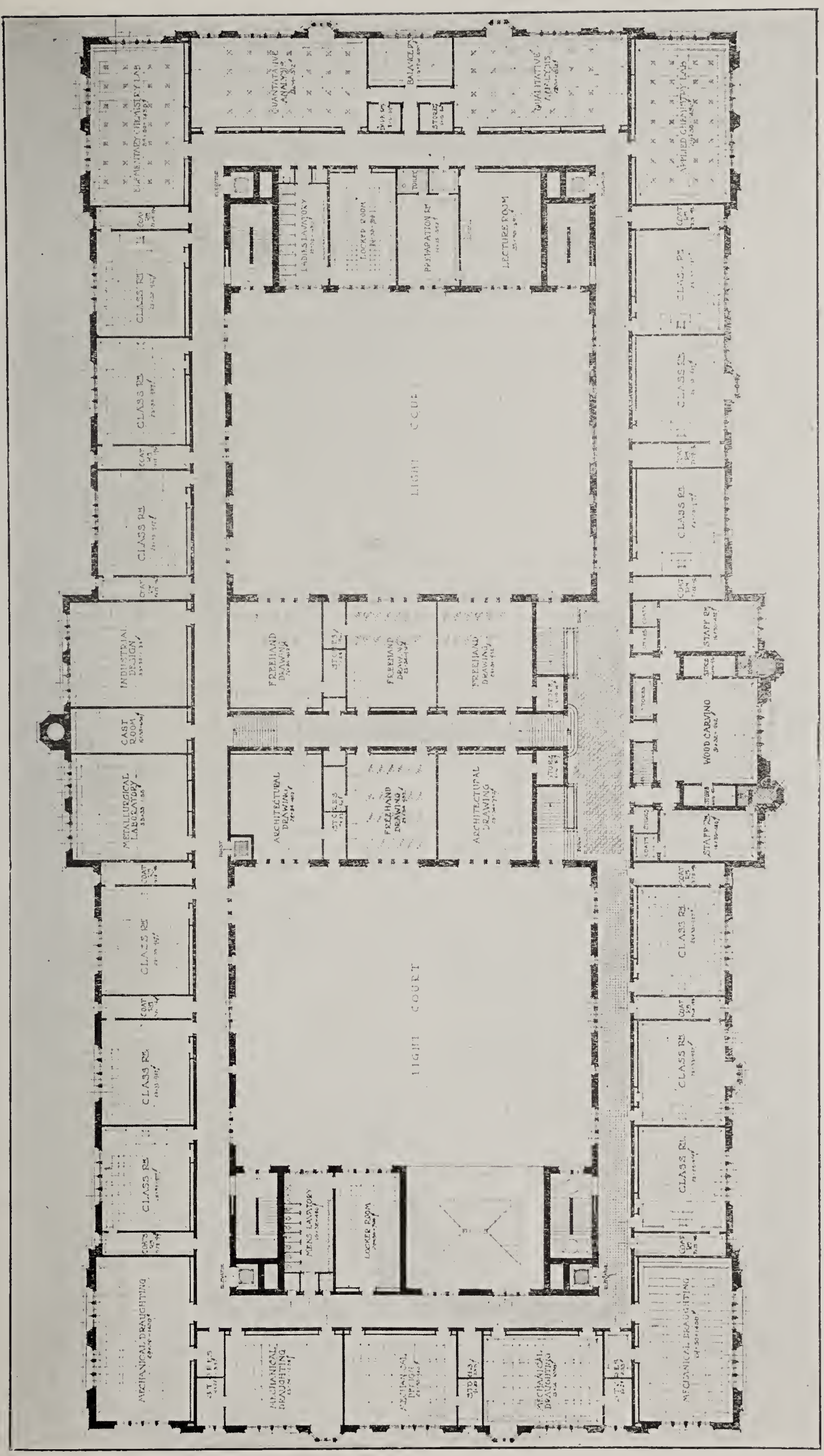
English, Writing, Arithmetic, Mechanical Drawing, Freehand Drawing, Showcard Lettering, Wood Carving, Clay Modelling, Office Practice	100
Total registration in Classes	2,617
Overlaps	563
Total number of Students	2,054

TOTAL REGISTRATION

In the Day and Evening Schools	2,544

Value of Equipment

INDUSTRIAL ART		
Equipment—		
Drawing Models and Instruments for Art Work	$1,397 62	
Printing Equipment	1,200 00	
Painting and Decorating	300 00	
Library	443 70	
		$3,341 32
HOUSEHOLD SCIENCE		
Equipment	$1,328 62	
Library	139 88	
		$1,468 50
MATHEMATICS		
Equipment	$274 00	
Library	73 00	
		347 00
SHOP		
Equipment—		
Benches	$555 00	
Lathes and Grinder	507 00	
Tools	887 00	
Cabinets and Lockers	330 00	
		2,279 00
PHYSICS		
Apparatus	4,375 00	
Library	328 00	
		4,703 00
CHEMISTRY		
Apparatus	$3,035 00	
Library	295 00	
		3,330 00



Proposed Industrial, Technical, and Art Schools, Toronto. (Third Floor Plan)

ENGLISH, HISTORY, MODERN LANGUAGES

Maps	$50 00	
Library	449 00	
		499 00
Total		$15,967 82

Present Accommodations

The Central Technical School is at present in a group of buildings on College Street. The main building, erected for the Toronto Athletic Club, was used as a club-house for several years. When the building came into the possession of the Technical School Board in 1900, the interior was remodelled, and now provides 10 class-rooms, 4 laboratories, 2 kitchens, 3 art rooms, 2 industrial design, and architectural and machine drawing rooms, 1 lecture room, and 1 supply (store) room.

Two dwelling-houses have recently been equipped for school purposes, and furnish very fair accommodation, the one for practical work in printing, painting, and decorating; the other, for dressmaking.

Two portable school buildings, such as are provided for temporary use in connection with the Public Schools of Toronto, were erected during the last year for shop work classes in Wood and Metal. These buildings, each 42′ x 37′, are also used for Carpentry and Cabinet Making Trade Classes in the evening, and for the shop work classes of the day school.

These five buildings provide accommodation for an average evening attendance of about 750 students.

The Central School is well equipped for the teaching of Household Science, Electrical Engineering, Mechanical Drawing, Architecture, and Industrial Art and Design.

The Branch Schools, Humberside and Riverdale, which do not offer practical trade instruction, are conducted in the Humberside Collegiate Institute and the Riverdale High School, respectively.

The Junior Branch School, George Street, is conducted in the George Street Public School. This school, being a Manual Training centre, in connection with the Public School system, affords accommodation for shop work in wood and metal for the evening classes held there.

Proposed Accommodation

A site, nearly six acres in extent has been provided for a new Central Technical School. Plans have been drawn for this building, and it is expected that the work of construction will begin in a few weeks. The frontispiece of this Bulletin represents the front elevation of the proposed new building. The ground plans are given here.

This building is designed to accommodate two thousand day pupils and five thousand evening pupils. The accommodation is shown in the accompanying photograph. The elevation and ground plans may be summarized as follows:—

(1) An Assembly Hall with seating capacity for 1,500 persons.

(2) A Lecture Theatre, with seating capacity for 200 persons.

(3) Four Lecture rooms, each with a preparation room and seats for 100 persons.

(4) Thirty class-rooms, each with adjacent coat-room, and each accommodating 40 persons at single desks.

(5) Twenty Workshops, including a Construction room, 81′ x 39′ and 25′ high.

(6) Twelve Chemical, Physical, and Engineering Laboratories.

(7) Fourteen Drafting and Design rooms, including rooms for Clay Modelling and Wood Carving.

(8) One Mathematics Laboratory.

(9) Four Kitchens, One Laundry, Two Millinery Workshops, Two Sewing rooms, Two Dressmaking rooms, One Power Machine room. Suite of Model rooms, Dining-room, Kitchen, Bedroom, Bathroom.

(10) One Gymnasium 46′ x 91′, and 18′ high in the clear. One Swimming pool, 31′ x 65′. Twenty-four Shower Baths. Dressing-room with 40 dressing boxes.

(11) Twelve locker rooms, each accommodating 100 lockers.

(12) Three assembling rooms and one bicycle room.

(13) One Supply (Store) room.

(14) Two Lunch rooms.

(15) One Exhibition room.

(16) One Reading-room and Library.

(17) Three office and Board rooms.

(18) Twelve Office Work rooms for the Heads of Departments and their Assistants.

(19) Power Plant, with boilers to provide about 1,000 horse power.

General Remarks

The Technical Schools are popular with the citizens of Toronto generally. They have the active and hearty support of the Board of Trade, the Manufacturers' Association, and the Trades and Labour Council.

When the Central School is equipped to accommodate Part-time Classes for apprentices and other young men working at the trades, it is confidently expected that employers will readily agree to an arrangement whereby these young workers may spend at least two half-days a week in technical instruction.

The Day Industrial Course for boys and young men was organized in September last, and has already proved its value in meeting an educational need. Eighty boys have been enrolled in the first year, a number sufficiently large to tax the accommodation in the present laboratories and workshops.

Many friends of the school, manufacturers and others, have founded Annual Scholarships, of the value of Twenty-five Dollars each, to encourage the pupils to make their best efforts and to continue their courses to completion.

The experience of the Toronto Central Technical School has clearly demonstrated the great value of the instruction, especially in the case of boys who enter industrial life.

Many of the larger firms of the city have, during the past year, expressed their appreciation of the work done in the School, and have shown their confidence in the training by offering very lucrative and promising positions to pupils and graduates.

Co-operation on the part of Public School teachers and the generous support of the Board of Education, will soon call the attention of parents to the advantages of a system which contributes so directly to the material welfare of the boys and girls, and will tend to increase the number taking advantage of the Day Industrial Courses.

Text and Reference Books

The following is the list of text-books:

*Text-books purchased by pupils for class use.
†Books of compulsory reference.
Those not marked are for general reference.

Freehand Drawing:

Prang's Teacher's Manual of Art Instruction (8 parts)		Prang Educational Co., Boston.	$6 00
Art Education for High Schools		Prang Educational Co.	1 25
New Method of Education, J. L. Tadd		Orange Judd Co., Chicago	2 00

Book	Author	Publisher	Price

Design:

†Line and Form	W. Crane	Geo. Bell & Son	1 50
†Plant Form and Design	Midgley & Lilley	Chapman & Hall, Ltd., London.	2 50
†Nature in Ornament	L. F. Day	B. T. Batsford, London	2 00
†Pattern Design	L. F. Day	B. T. Batsford, London	2 25
†The Principles of Design	Batchelder	Inland Printing Co., Chicago	3 00
†Letters and Lettering	F. C. Brown	Bates & Guild	2 00

Mechanical Drawing:

†Universal Dictionary of Mechanical Drawing	Follows	Engineering News Co., New York	1 00
*Mechanical Drawing	Anthony	D. C. Heath & Co., Boston	1 50
Notes for Mechanical Drawing	F. E. Mathewson	The Taylor-Holden Co., Springfield	1 50

Machine Drawing:

*Machine Drawing	Anthony	D. C. Heath & Co., Boston	1 50
†Machine Designing, Construction and Drawing	Spooner	Longmans & Co., London	3 00
*Students' Edition (Beginners)			1 00
†A Manual of Machine Drawing and Design	Low & Bevis	Longmans & Co., London	1 75

Architecture and Building Construction:

*Architectural Drawing	Edminster		2 00
†Structural Drawing	Edminster		2 25
†Building Construction and Superintendence	Kidder Vols. I., II. & III.	W. T. Comstock	8 00
*Details of Building Construction	Martin	Bates & Guild, Boston	2 00
House Planning	Osborne	W. N. Comstock	1 00
Architectural Composition	Robinson	D. Van Nostrand Co.	2 50
Practical Lessons in Architectural Drawing	W. B. Tuthill	W. T. Comstock	2 50
†Vignola	Tuckerman	W. T. Comstock	5 00

Perspective:

†Complete Perspective Course	Spanton	Macmillan & Co.	1 25
†Architectural Perspective	Wright	W. T. Comstock	2 50

General:

†Volumes of the International Correspondence School and the American Correspondence School are very valuable for reference in all branches.

Book	Author	Publisher	Price
Mathematics:			
Secondary School Mathematics, Books 1 and 2	Short & Elson	D. C. Heath & Co.	2 00
Shop Problems in Mathematics	Breckenridge, Mersereau & Moore	Ginn & Co.	1 00
Shop Mathematics	Holton	The Taylor-Holden Co.	1 25
Practical Mathematics and Geometry	Bates & Charlesworth	D. Van Nostrand Co. (2 vols.)	2 70
*Elementary Algebra	Baker & Bourne	G. Bell & Sons	60
†Machine Shop Arithmetic	Colvin & Cheney	Hendry Pub. Co.	50
†Engineers' Arithmetic	Colvin & Cheney	Hendry Pub. Co.	50
Workshop Mathematics	Castle	The Macmillan Co.	65
*Logarithmic and other Tables	Castle	The Macmillan Co.	15
†Manual of Practical Mathematics	Castle	The Macmillan Co.	1 50
†Practical Mathematics	Knott & McKay	Chambers	1 10
Elementary Mensuration	Stevens	The Macmillan Co.	90
†Practical Geometry for Beginners	Foster & Dobbs	The Macmillan Co.	60
Plane Surveying	Carhast	Ginn & Co.	1 80
Field Engineering	Searles	Wiley & Sons	3 00
Hand Book of Practical Mechanics	Saunders	Saunders	90
*Practical Trigonometry	Playne & Fawdry	Arnold	65
Applied Mathematics	Cobb	Ginn & Co.	1 25
Woodwork Exercises Treated Mathematically	Drury	G. Bell & Sons	60
Examples in Elementary Mechanics	Dobbs	Methuen & Co.	1 10
†Mechanical Engineers' Pocket-book	Kent	Wiley & Sons	5 00
†Mining and other Tables	Hatch & Valentine	The Macmillan Co.	1 40
†Hand Book	Cambria Steel	Cambria Steel Co.	1 00
†Hand Book	Jones & Laughlin Steel Co.	Jones & Laughlin Steel Co.	1 00
Hand Book	Carnegie Steel Co.	Carnegie Steel Co.	2 00
Chambers' Tables		The Macmillan Co.	2 00
Physiology:			
Physiology	Kirke	P. Blakeston's Son	2 70
*Physiology	Kimber	Macmillan & Co.	2 50
Hygiene:			
Practical Hygiene	Harrington	Lea Bros., Philadelphia	4 25
Practical Hygiene	Parke	P. Blakeston's Son	2 70
Food and Dietetics:			
Food and Dietetics	Hutchison	Wm. Wood & Co., N.Y.	3 00
Practical Dietetics	Gilman Thompson	Appleton's	5 00
Diet in Health and Disease	Friedenwald & Ruhrab	W. B. Saunders	4 00
Food and its Functions	Knight	Blackie & Son	1 50
Bacteriology:			
*Bacteria Yeasts and Moulds	Conn	Ginn & Co.	1 00
Bacteria in Milk and Its Products	Conn	P. Blakeston's	1 00
Infection and Immunity	Sternberg	Putman	1 50
Disinfection and Disinfectants	Roseman	Blakeston	2 00
Technical Mycology	La Far	Griffin & Co., London	1 50
Hygiene of Transmissible Diseases	Abbott	Saunders & Co.	3 00

Book	Author	Publisher	Price
Textiles:			
Household Textiles	Gibbs	Whitcomb & Barron	1 75
Textile Fabrics	Matthews	John Wiley & Sons	3 60
Textiles	Dooley	Heath & Co.	1 75
Home Nursing:			
*Text-book of Nursing	Weeks Shaw	Appleton	1 58
Practical Points in Nursing	Stoney	Saunders	1 58
Marketing:			
Food Products of the World	Green	Pitman	1 00
The World's Commercial Products	Green	Pitman	4 00
Food Materials and Their Adulterations	Richards	Whitcomb & Barron	1 00
General Physics:			
Physics	Millikan & Gale	Ginn & Co.	1 50
Physics	F. M. Gilley	Allyn & Bacon, Boston	1 50
Physics	Mann & Twiss	Scott, Foresman & Co., Chicago	1 50
Physics	Watson	Longmans, Green & Co.	3 00
Physics Advanced	Barker	Henry Holt & Co.	3 50
†Physical Tables		Smithsonian Institution	2 00
New Knowledge	Duncan	D. Van Nostrand Co.	2 00
Heat and Steam:			
Steam Engine	Duncan	Macmillan Co.	1 00
Steam	Ripper	Longmans, Green & Co.	50
Steam Engine	Pullen	Scientific Pub. Co., Manchester.	1 50
Operating Steam Plant	Wakeman	D. Van Nostrand Co.	25
Guide to Firemen	Wakeman	D. Van Nostrand Co.	50
Smokeless Combustion	Hays	Hill Pub. Co., N.Y.	1 50
Ventilation of Buildings	Snow & Nolan	D. Van Nostrand Co.	50
†Heating and Ventilation	Allen	Domestic Engineering Co., Chicago	2 00
†Principles of Heating	Snow	Heating and Ventilating Magazine, N.Y.	2 00
Power		Hill Pub. Co., N.Y., per year	3 50
Heating and Ventilation	Carpenter	Wiley & Sons	4 00
Heating and Ventilating Magazine		New York	1 00
Electricity:			
*Elementary Electricity and Magnetism	Jackson and Jackson	Macmillan Co.	1 50
*Practical Electricity	C. W. Swoope	D. Van Nostrand Co.	2 00
†Practical Management of Dynamos and Motors	Crocker & Wheeler	D. Van Nostrand Co.	1 00
Testing Dynamos and Motors	Smith	Scientific Pub. Co., Manchester.	1 25
Electrical Calculation	Atkinson	D. Van Nostrand Co.	1 50
Problems in Electricity	Weber	Spon & Chamberlain	2 00
Problems in Electricity	Hooper & Wells	Ginn & Co.	1 25
Electricity	Ashe	D. Van Nostrand Co.	2 00
Alternating Currents		International Text Books	5 00
Alternating Currents	Hay	Harper Bros.	1 25
Alternating Engineering	Raymond	D. Van Nostrand Co.	2 50
Electrical World and Engineer		New York, per year	4 50
†Illumination and Photometry	Wickenden	McGraw, Hill Co., N.Y.	2 00

Book	Author	Publisher	Price
Applied Mechanics and Engineering:			
*Applied Mechanics for Beginners	Duncan	Macmillan Co.	50
†Experimental Mechanics	Pullen	Longmans, Green & Co.	1 50
†Strength of Materials	Mather	Out of print.	
Engineering	King	Friedenwald Co., Baltimore	4 00
Applied Mechanics	Goodman	Longmans, Green & Co., or D. Van Nostrand Co., about	2 00
Applied Mechanics	Perry	D. Van Nostrand Co.	1 50
†Mechanical Engineering	Lincham	Chapman & Hall, London	3 00
†Architectural Engineering	Freitag	John Wiley & Sons	3 50
*Handbook	Cambria Steel Co.	Johnstown, Pa.	1 00
Shopwork:			
†Foundry Work	Simpson	Amer. Correspondence School..	1 00
†Moulder's Text Book	West	Wiley & Sons	1 50
†Foundry Work		International Text Book Co.	5 00
†Patternmaking		International Text Book Co.	5 00
†Patternmaking	Purfield	Man. Arts Press, Peoria, Ill.	1 50
†Manual Training Magazine		Peoria, Ill., per year	1 50
†Carpentry	Townsend	Amer. Correspondence School..	1 00
†Carpentry		International Text Book Co.	5 00
Carpentry—Vol. II of Building Construction	Kidder	Wm. T. Comstock, N.Y.	....
American Carpenter and Builder		Chicago, per year	2 00
†Popular Mechanics		Chicago, per year	1 50
†American Machinist		New York, per year	5 50
Furniture	Crawshaw	Manual Arts Press, Peoria, Ill..	1 25
Handwork in Wood	Noyes	Manual Arts Press, Peoria, Ill..	2 00
Inorganic Chemistry:			
*An Elementary Study of Chemistry	McPherson & Henderson	Ginn & Co.	1 20
Organic Chemistry:			
*Organic Chemistry	Remsen	D. C. Heath & Co.	1 25
*Theoretical Organic Chemistry	Cohen	Macmillan Co.	1 25
Industrial Chemistry:			
†Outlines of Industrial Chemistry	Thorp	Macmillan Co.	3 50
†Industrial Organic Chemistry	Sadtler	J. B. Lippincott Co.	3 50
Qualitative Analysis:			
No book recommended. Tables are supplied to the students.			
Quantitative Analysis:			
*Manual of Chemical Analysis	Newth	Longmans, Green & Co.	1 75
Metallurgy:			
Principles of Metallurgy	Hiorns	Macmillan Co.	1 50
English:			
Common Errors in Speaking and Writing	H. I. Strang, B.A.	Copp, Clark Co.	35
Written and Oral Composition	Sampson & Holland	American Book Co.	60
The Theory and Practice of Technical Writing	Samuel Earle	Macmillan Co.	1 25
Civics:			
Canadian Civics	R. S. Jenkins	Copp, Clark Co.	35

HAMILTON

DAY AND EVENING INDUSTRIAL, TECHNICAL, AND ART SCHOOL

Advisory Industrial Committee

Chairman: Alfred Ward

MEMBERS OF THE SCHOOL BOARD

F. J. Howell, President, The Howell Lithograph Co.
J. Orr Callaghan, Managing Director, Canada Screw Co.
Geo. Armstrong, in charge of Dyeing Department, Hamilton Cotton Company.
W. J. Clark, Firm of Adam Clark, Plumbers.
Alfred Ward, Retired Furniture Manufacturer.
Alex. Blanchard, Book-keeper, M. Brennen Lumber Co.

APPOINTED MEMBERS

H. C. Beckett, Wholesale Grocer, W. H. Gillard Co.
A. M. Cunningham, Photographer.
J. A. McMahon, Manager, Union Drawn Steel Co.
Robt. Patterson, Pattern maker.
Thomas Christie, Sup't, Sawyer-Massey Co. (agricultural implements)
Julius Williams, Chemist, F. F. Dalley Co. (grocers' sundries, blacking, etc.)

Staff

Principal and Mathematics of Day Class: J. G. Witton.

Course in Honour Mathematics at Toronto University, graduating in the Department of Physics in 1888. Ontario High School Principal's Certificate, with specialist standing in Mathematics. Taught about sixteen years, most of the time in Ontario High Schools; last position Principal of Dunnville High School. Afterwards spent two years studying Architectural Engineering at the University of Michigan. Left before completing the course, but was granted degree of B.Sc. in preparation for Engineering, in recognition of work done. Principal of Hamilton Technical and Art School for three years. Salary, $2,200.

Woodworking Department: Frederick Taylor.

Apprenticed in England. Has had thirty years' experience at the bench and on buildings. Experienced in Carpentry and Cabinet-making. Experience in drafting detail work. Manual Training Teacher's Certificate. Before entering on present duties was teacher of Manual Training at Wentworth Street School, Hamilton. Day and Evening Classes. Salary, $1,200.

Forging Department: Julian H. Thomas.

Had long experience in blacksmithing in the City of Hamilton before entering on present position when the school opened. Holds Ontario Certificate in Manual Training. Day and Evening Classes. Salary, $1,100.

Department of Machine Shop Practice: John A. Gee.

Served time in England as Electrical Instrument maker. Has had twelve years' experience in Machine Shop Work. Six years' teaching experience at the Crewe (England) Mechanics' Institute and with apprentices at the Crewe Railway Works. Holds First Class Honours Certificate in Light and Power Transmission from the City and Guilds of London Institute, and certificates from the Science and Art Department, London, England, in Applied Mechanics, Machine Drawing, Theoretical and Practical Chemistry, and Magnetism and Electricity. Elementary education obtained at Stockport Grammar School and Manual Training Department of Manchester Technical School; technical training at Manchester Technical School, the Owens' College. and Stockport Mechanics' Institute. Teaching under temporary Ontario certificate. Appointed to present position August, 1912. Day and Evening Classes. Salary, $1,000.

Industrial, Technical, and Art Schools, Hamilton

Instructor in Electricity: H. N. Nold.

Took a three years' course in Engineering at Purdue University, Lafayette, Ind.; subsequently took a three years student's course with the General Electric Co.; has had ten years' experience as a Mechanical and Electrical Engineer. Appointed to present position on the opening of this school. Teaches Electricity and Mechanical Drawing in Day Classes, Electricity in Evening Classes. Salary, $1,400.

Department of Household Science: Miss I. W. Strong.

Teacher's Certificate in Domestic Science. Eight years' experience in teaching. Cookery, Day and Evening Classes. Salary, $850.

Miss Frances E. Springate.

In the dressmaking business for fifteen years before accepting present position three years ago. Sewing and Dressmaking, Day and Evening Classes. Salary, $650.

Miss Emelia Blaine.

Long experience in trade. Sewing and Dressmaking, Evening Classes and Part-time Day Classes. $1.00 per evening, $1.15 per afternoon.

Miss F. Faustman.

A practical milliner. Has had experience with Murray & Co. and other firms. $1.50 an evening.

English: H. E. Collins.

B.A., Toronto University, 1905. Specialist in Modern Languages and History. On staff of Hamilton Collegiate Institute. Part time Day Classes.

Physics: W. J. Moffatt.

B.A., Queen's University, Kingston. On staff of Hamilton Collegiate Institute. Part-time Day Classes.

Mathematics: C. H. McGee.

M.A., Trinity University, Toronto. On staff of Hamilton Collegiate Institute. Specialist in Mathematics. Evening Classes. Salary, $3.00 an evening.

Department of Mechanical Drawing: Norman S. Cumming.

Studied six or seven years at the Hamilton Art School, gaining certificates from the Ontario Education Department in Freehand, Model and Memory Drawing, Geometrical and Mechanical Drawing, Sepia and Wash Drawing, and Industrial Design. Matriculated, and spent four years in the Electrical Engineering Department at Toronto University. Worked one year in the Machine Shop and Armature Department of the car shops of the Dominion Power & Transmission Company, Hamilton; also considerable time in the Company's drafting room. At present in the employment of the same Company. Evening Classes. Salary, $30 a month.

Department of Architectural Drawing: Gordon J. Hutton.

Passed Junior Matriculation Examination. Received architectural training in Hamilton and Chicago offices. Fifteen years' experience; practising architecture for ten years. A member of the firm of Mills & Hutton, Architects, Hamilton. Has taught three years at Hamilton Art School and three years in present position. Evening Classes. Salary, $30 a month.

Head of Art Department: John S. Gordon.

Studied at the Art School, Hamilton, and at Paris, France. Holds Ontario Silver Medal (1893), with special certificate for Industrial Design, and Gold Medal (1894), with special certificate for Advanced Drawing. Taught life drawing and painting in Hamilton Art School for six years before taking charge of the Art Department of this school. Has had practical experience in the industrial application of Art. Day and Evening Classes. Salary, $1,700.

Art Department: Mrs. Bessie G. Stevens.

General Assistant Teacher in Art. Prize in National Competition, London, Eng. Government Art Teacher's Certificate (1902), London, Eng. Five years' experience teaching at School of Art, Bristol, Eng. Salary, $650.

China Painting: Miss Ida G. Hamilton.

Attended the Hamilton Art School for six years, receiving certificates in the full Normal Art Course and a diploma. Later, studied landscape painting and composition, design and its application to china painting, with Marshall T. Fry, of New York. Taught at the Hamilton Art School, Highfield School, Hamilton, and privately for three years. Two evenings per week and part of the day. Salary, $350.

PRINCIPAL'S REPORT

Accommodations

The City of Hamilton has made comprehensive provision for industrial education. It has erected an Industrial,Technical, and Art School, connected with the Collegiate Institute building, at a cost, with equipment, of about $100,000. The whole building is specially fitted up for industrial work. In the basement, which is high and well lighted, are located the forging department and the electrical laboratory; on the first floor are the woodwork shop, the machine shop and class-rooms; and on the second floor, the household science department, the drafting room, the printing department, and class-rooms; while the whole of the third floor is devoted to the art department. The school was opened in September, 1909, and provides for both day and evening classes. The accommodations meet all present requirements.

In my opinion, a building for industrial education should be of mill construction to avoid excessive vibration of machinery, with double floors "deafened" with mineral wool. At one end of each shop there should be a class-room accessible either from the shop or the hall. It is desirable that one large room in the basement should be two stories in height, with a gallery at the level of the first floor. Such a room would be useful for practical work in carpentry (building a model house), electric wiring, plumbing, etc.

Equipment and Value

The Wood Shop contains 24 benches furnished with vises and sets of the smaller tools used in the commoner operations of carpentry, cabinet-making, and pattern-making, and also 7 wood-turning lathes with smaller tools for wood-turning, one rip and cross-cut power saw, 1 30-in. band saw, 1 buzz planer and 1 power grindstone.

The Forge Shop is equipped with benches fitted with blacksmith's vises, 16 Sheldon down-draft forges with blast and exhaust systems, and a full complement of anvils and small tools.

The Machine Shop is equipped with benches furnished with vises and individual sets of tools, and the following machine tools: 1 high speed and 6 engine lathes of from 11 to 16 inches swing; 1 24-in. x 24-in. x 6-ft. planer; 1 16-in. back-geared shaper; 1 20-in. drill press with hand and power feed; 1 power hack saw; 1 grinder and 1 milling machine.

The Electrical Laboratory is equipped with a full line of apparatus for experiments in elementary electricity and magnetism, and with the following generators and motors: 1 motor-generator set, including a 5 H.P. 220 volt, 66 2-3 cycle, 2 phase induction motor, direct connected to a 5½ k. w., 125 volt, compound, direct current generator; 1 5 H.P. 110 volt, 66 2-3 cycle, single phase induction motor, with auto starter; 1 2 H.P. 125 volt, variable speed direct current motor, with rheostat; 1 3 k. w. double current generator, supplying either direct current or 2 phase alternating current, with rheostats; 1 2 H.P. 66 2-3 cycle, 110 volt, single phase induction motor, with auto starter. Ammeters, voltmeters, transformers, etc., for use with the above.

The Mechanical Drawing room is furnished with fifty drawing tables and the necessary black-boards, T, and set squares. The students provide their own instruments.

The Household Science Department is equipped with tables, stoves, and utensils to accommodate 24 pupils at one time. Dressmaking and Whitewear have a large room devoted to them, with all the necessary tables, sewing-machines, irons, mirrors, and fitting stands. A part of this room is screened off by cabinets and used as a fitting room. Millinery is taught in a separate room, with all the necessary equipment.

The Art Department occupies the whole of the third floor, and, in addition to the equipment of the old Hamilton Art School, has been furnished with everything required to successfully carry out the course of study outlined below.

Industrial, Technical, and Art Schools, Hamilton—Wood Shop

The cost of the above equipment is as follows:—

Wood Shop	$2,891 36	
Machine Shop	2,990 92	
Forge Shop	2,077 65	
Electrical Laboratory	1,977 85	
Drafting room	1,240 00	
Printing room	702 96	
Sewing room	564 41	
Millinery room	50 20	
Office	120 00	
General Expenses (lockers, etc.)	873 00	
		$13,488 35
Art Department (estimated)	$1,500 00	
Cookery room (estimatetd)	800 00	
		2,300 00
		$15,788 35

Courses of Study

Besides the following courses, we have had this fall some demand for instruction in tinsmithing, pattern making, plumbing, and painting. During one winter we had a small class in printing, but the number of pupils dwindled until the subject had to be dropped from the list. Possibly a job printer as teacher, instead of a newspaper printer, might have accomplished more. As I am informed that employers have difficulty in securing enough printers for their work, and that good wages are paid, I have not given up hope that we may be able yet to form a class. This fall, also, the secretary of one of the city painters' unions applied for instruction. At my suggestion he took up the subject of the organization of a class with his union, with promising results. The matter is now in the hands of a subcommittee of the Advisory Industrial Committee. A painter who has had experience in teaching the subject in an English technical school is available for the work of instruction.

I. DAY COURSES FOR BOYS

The programme is designed to enable the pupils to make all ordinary workshop calculations, to understand the mathematics and the leading scientific principles underlying the construction and operation of machinery, to make workshop drawings and read blue prints, to manipulate tools and apparatus, and to acquaint themselves with materials and processes of construction.

The complete course covers three years. In the first year, pupils entering the school from the Fourth Form of the Public or the Separate School, or with High School Entrance standing, are required to take all the subjects prescribed. In the second and third years the book studies and drawing are obligatory, but specialization in shop work is allowed within limits determined by the Principal in each individual case. Pupils entering with higher standing than High School Entrance are treated as Special Pupils, and may be excused from some of the classes at the discretion of the Principal.

English

The aim of this course is to enable the pupil to express himself fluently and accurately, whether orally or in writing, and to develop in him a taste for good literature. Composition is stressed, and frequent exercises required based on prescribed reading, visits to factories and workshops, etc. A number of periodicals and magazines are available for home reading.

Elementary formal grammar; drill on words commonly misused or misspelt; mechanics of composition, including punctuation, use of capitals, paragraph structure, etc.; theme writing; letter writing; oral composition.

Arithmetic

A practical course, with special emphasis on such work as has reference to commerce and industry.

Practice to ensure rapidity and accuracy in simple calculations; approximate and check methods; denominate numbers; vulgar fractions; decimals; square root; percentage and its simpler applications; mensuration of plane figures and solids; handbook formulas; graphical treatment of statistics, etc.; logarithms; oral arithmetic.

Algebra

The notation of algebra; the significance and interpretation of algebraical formulas; the four simple rules; brackets; simple equations in one and two unknowns with numerical coefficients, and problems leading to simple equations.

Elementary factoring; highest common factor and least common multiple; fractions; a simple treatment of indices and surds; quadratic equations with numerical coefficients.

Trigonometry

The measurement of angles; the trigonometrical ratios of an angle and the relations connecting them; explanation and drill in the use of trigonometrical tables, the solution of right-angled triangles; proofs of formulas used in the solution of oblique triangles; the general solution of triangles; problems.

Physics

Laboratory and class-room work in elementary physics (excepting electricity, which is taught independently).

Measurement; the general properties of matter; elementary hydrostatics; specific gravity. Thermometric scales; specific heat; latent heat; melting and boiling points; steam raising and the properties of steam; saturated and superheated steam; the transmission of heat; conduction; convection and radiation; hot and cold water supply; use of exhaust steam; systems of heating and ventilation. The steam engine.

Elementary mechanics; force; the parallelogram, triangle, and polygon of forces; friction; work; the inclined plane; moments; levers and mechanical movements; pulleys; gearing; block and tackle; momentum; acceleration; energy.

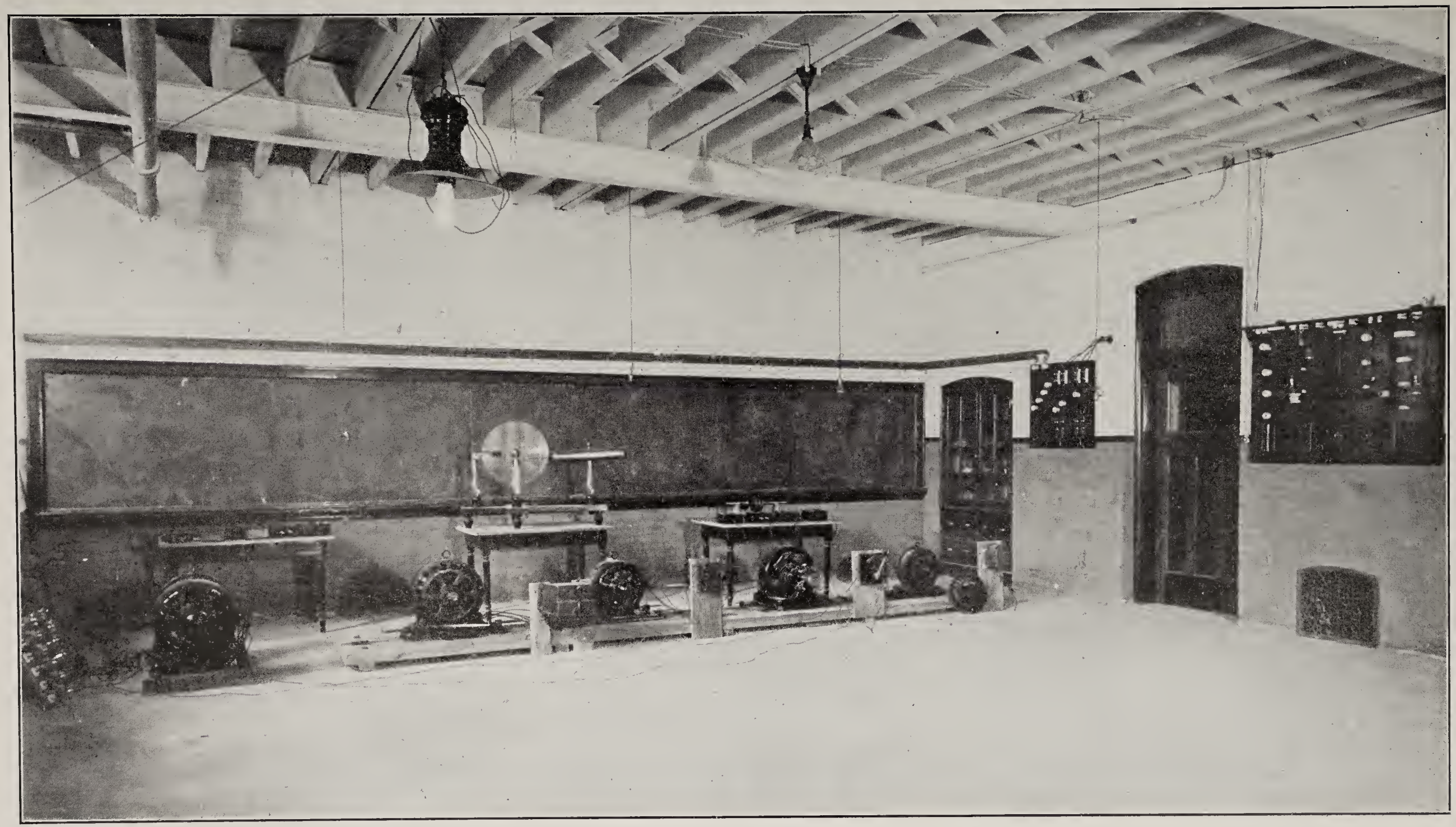
Geometrical Drawing

Instruction in Geometrical Drawing precedes that in Projections. Later in the course, problems are assigned to meet the requirements of individual pupils.

Preliminary practice in the use of drawing instruments, triangles and scales; lettering; accurate construction of simple figures of given dimensions; geometrical constructions, illustrating the geometry of the line, triangle, quadrilateral, polygon and circle; construction of the ellipse and the parabola. Some leading propositions arrived at by induction.

Projections

Third angle projections; sections; dimensioning; working drawings from models and perspective sketches; intersections and developments; isometrical drawings; simple problems in descriptive geometry; cams, gears, etc. Dimensioned freehand and working drawings of simple machine parts. Tracing and blue printing.



Industrial, Technical and Art Schools, Hamilton—Electrical Laboratory

Freehand Drawing

Familiar objects in outline; simple fore-shortened faces; quick sketches to give practice in judging proportions; elementary principles of perspective practically developed; fore-shortened cylindrical and prismatic forms in outline with practical application to simple parts of machines, frames, doors, etc.

Woodworking

Instruction in the growth of trees, cutting up, seasoning and drying lumber; kinds and qualities of wood; warping; selection of lumber; construction, care and uses of woodworking tools.

Practical work: Measuring and laying out of work; exercises in sawing, planing, chiselling, etc.; the joints commonly used in carpentry and cabinet work.

Making simple pieces of furniture and apparatus; staining and polishing; woodturning; elementary pattern making.

Forging

Shop talks on: iron ores; varieties of iron and steel; pig-iron; malleable iron; action of foreign elements on pig-iron; combustibles; smelting furnace; iron castings; welding; iron in fusion (Bessemer and Siemens-Martin processes), tempering.

Practical instruction in drawing down, bending, and welding. Simple exercises, including the forging of hooks, staples, rings, lathe tools. Calculation of amount of stock required.

Machine Shop Practice

Exercises in chipping, filing, scraping, and polishing.

Explanation of the parts and methods of operation of the lathe, drill, shaper, planer, and milling machine.

The building of complete machines forms the advanced work of this course.

Electricity

An introductory class-room and laboratory course in magnetism and electricity. Magnetic lines of force, simple voltaic cell, electrochemical series, two-fluid cells of various types, Ampere's law, Ohm's law, measurement of resistance by various methods, law of divided circuits, battery resistance, heating effect of current, induced currents, the arithmetic of electricity.

Wiring problems and practical exercises in wiring, industrial applications of electricity, the telegraph, the telephone, electric lighting, generators and motors, transformers.

The testing of generators and motors of various types.

II. SPECIAL DAY COURSES FOR GIRLS AND WOMEN

Cookery, Etc.

1 Period of one and one-half hours per week

Methods of cooking, boiling, simmering, steeping, steaming, broiling, pan broiling, sautéing, frying, baking. Care of kitchen utensils, etc., dish washing, sanitation, and disposal of waste.

Effect of heat upon common food materials. Care of the stove. Fuels. Planning cooking and serving a meal. Composition of foods and functions of the body.

Fruit preserving, canning, etc. Soft and hard water, soap, soda, etc., their effect upon various fabrics. Removal of stains. Diet for invalids, infants, and children.

Sewing and Dressmaking

3 Periods of one and one-half hours each, per week

Elementary stitches; sewing on buttons, hooks, and tapes. Darning and mending. Hemming, running, basting. Making bags, aprons, pot holders, towels, cuffs, etc.

Advanced stitches applied to small garments, hemmed patch, fine mending, making, and working button-holes. The use of patterns. Making underwear.

Taking measurements and drafting patterns. Cutting out and making simple garments. Threading and running sewing-machines, care of same. Use of attachments.

III. Evening Courses

DIPLOMA COURSES

Diplomas are awarded to pupils who complete any one of the following courses satisfactorily. Written examinations are held in most of the subjects at the end of the school year. The time required for each diploma course is approximately three evenings per week for two years. Pupils are urged to enroll for one or other of these courses. The outlines of the courses are given below. The Committee reserves the right to cancel any class in which fewer than ten pupils are in regular attendance.

All subjects are taught three evenings a week, two hours each evening, with the exception of china painting (two evenings a week) and mathematics (one evening a week).

Architectural Drawing

Geometrical Drawing, Courses I and IA. Mathematics, Course I; Building Construction, Course I; Architectural Drawing, Course I; Architectural Drawing, Course II; Freehand Drawing.

Mechanical Drawing

(A course for pupils preparing for commercial draftsmanship) Geometrical Drawing, Course I; Mechanical Drawing, Course I; Mechanical Drawing, Course II.

Electricity

Electricity, Course I; Mathematics, Course I; Electricity, Course II; Electricity, Course III; Mechanical Drawing, Course I; Freehand Drawing of Electrical Diagrams.

Forging

Forging, Course I; Mathematics, Course I; Forging, Course II; Mechanical Drawing, Course I.

Machinist

Machine Shop Practice, Course I; Forging, Course I; Mathematics, Course I; Machine Shop Practice, Course II; Mechanical Drawing, Course I;

Woodworking

Carpentry, or Cabinet Making, or Pattern Making; Mathematics, Course I; Mechanical Drawing Course I; Freehand Drawing.

Household Science

Cookery; Sewing and Dressmaking, Course II; Millinery.

NOTE.—For Art, see under Art Department.

Building Construction

Course 1.—Excavation; foundations; carpentry, (floors, roofs, partitions, beams, jointing and fixing of same); window frames, roofs, shingling and tiling; brickwork, (principal bonds, footings, walls, piers, arches, copings); masonry, (stones in general use, methods of building stone walls, arching); plumbing, (metal roofs, gutters, flashings, hips and valleys); plastering.

Course 2.—Excavation and foundations for different soils: concrete, (kinds and use in floors, etc.); brickwork, (chimney construction, building by-laws, thicknesses of walls); masonry, (various kinds of stone and their application); iron work, (roof trusses, girders, reinforced concrete, properties of cast iron, wrought iron and steel); carpentry and joinery, (staircases, skylights, dormers, etc.); sanitary work, (principles of simple domestic drainage, water service, and ventilation); heating systems, lighting, (gas and electricity); the less common materials of construction.

Architectural Drawing

Course 1.—Plans and elevation of simple frame and brick buildings. Building construction details; framing plans and sections, window frames, doors, water tables and bases, cornices and roofs, verandas, dormers, gables, etc. Interior finish. Bond in brick and stone.

Course 2.—Course 1 extended. The classic orders. Original planning and design of buildings.

Geometrical Drawing

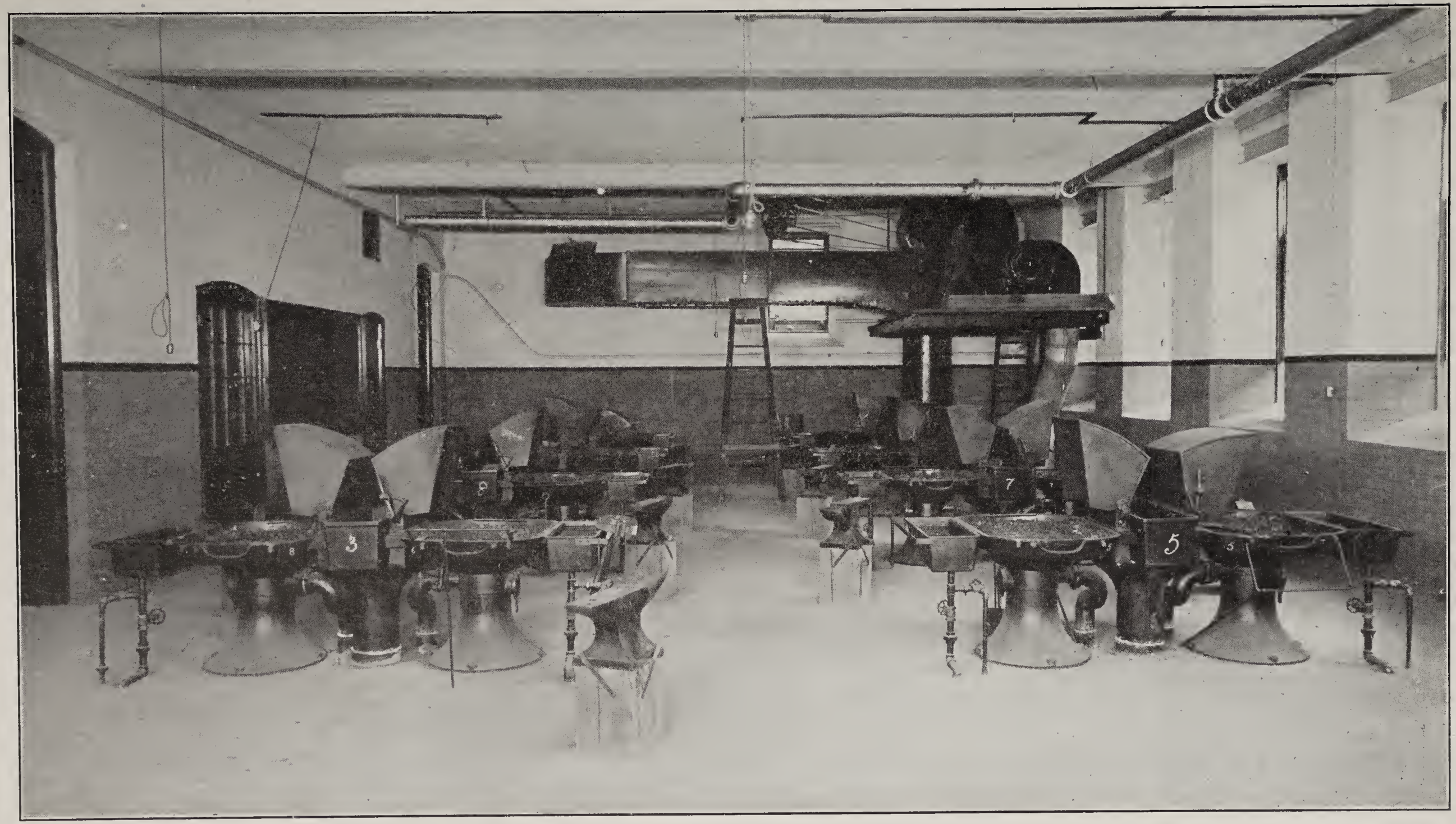
Course 1.—The use and care of drawing instruments, triangles, scales, etc.; lines and angles, triangles, quadrilaterals, polygons, circles and tangents. Some leading propositions arrived at by induction.

Course 1A.—(Additional for pupils in architectural drawing) The ellipse, parabola and hyperbola, spirals, the Ionic volute, cycloids, etc.

Mechanical Drawing

Course 1.—The purpose of this course is to train pupils to make and to read simple working drawings.

The use and care of drawing instruments, triangles, scales, etc., lettering and drafting room standards; working drawings from models and perspective sketches; easy intersections and developments; practice in reading working drawings; exercises related to the shop work of the diploma course in which the pupil is enrolled.



Industrial, Technical, and Art Schools, Hamilton—Forge Shop

Course 2.—A more intensive study of projective geometry and the drawing of machine detail; isometric drawing; freehand dimensioned sketches and working drawings of machine parts; cams, gears and mechanical movements; elements of machine design.

Freehand Drawing

Familiar objects in outline, simple fore-shortened faces, fore-shortened cylindrical and prismatic forms.

Architectural detail and ornament, (for pupils in architectural drawing), machine parts, (for others).

Mathematics

Course 1.—Denominate numbers, vulgar fractions and decimals, square root, percentage and its simpler applications, mensuration of plane figures and solids, handbook formulas, oral arithmetic.

The notation of algebra, the significance and interpretation of algebraical formulas.

Course 2.—The notation of algebra; addition, subtraction, multiplication and division; elementary factoring; easy fractions; equation in one unknown with numerical coefficients ; simple equations with two or more unknowns; problems.

Electricity

Course 1.—Elementary Electricity and Magnetism; a class-room and laboratory course, as outlined in the course for day pupils.

Course 2.—Problems and exercises in wiring, and electrical apparatus and instruments; as outlined in the course for day pupils.

Course 3.—The testing of generators and motors of various types.

Woodworking

Carpentry: Tools, construction, grinding and sharpening, and uses. Growth of trees, cutting up, seasoning and drying lumber, mechanical principles.

Graduated exercises in the use of various tools, angles, joints used in windows, doors and roofs, framing, etc.

Cabinet Making: Tools, construction, grinding and sharpening, and uses. Growth of trees; cutting up, seasoning and drying lumber; joints used in cabinet work; glueing and jointing; making simple pieces of furniture; staining and polishing; woodturning.

Pattern Making: Practice in methods used in general shop work, viz., in the construction of solid, split and built-up patterns, core boxes and core prints, lathe and bench work, from drawings made by the pupils.

Forging

Course 1.—As outlined in the course for day pupils.

Course 2.—Shop talks on the expansion and contraction of iron and steel, crystallization of iron, difference in structure of iron and steel, case hardening of iron, influence of carbon content on steel, tempering steel, explanation of temper colours, annealing of steel, calculating stock, manufacture of tool steel.

Exercises: Forging right-angled bend and working to square corner; welding tee plate; forging grab-hook from square stock; forging weldless ring from square stock; flat pean hammer, low carbon steel; cold chisel and cape chisel, crucible cast steel. Supplementary exercises, ornamental iron work, scrolls, etc., machine tools of various kinds.

Machine Shop Practice

Course 1.—Bench work, including chipping, filing, scraping, and polishing. Machine work begun.

Course 2.—Graduated exercises on the lathe, planer, shaper, and milling machine.

Cookery

Principles involved in the different methods employed in cookery, and their application to the different kinds of foods and food combinations, typical foods, as fruits, vegetables, cereals, milk, eggs, meat, etc. A simple study of the composition and the nutritive value of each food. Fruit preserving, canning, etc. A simple study of the lightening agents used in flour mixtures. Preparing and serving; soups, meat, fish and accompanying sauces, oysters, puddings and pudding sauces, salads and salad dressings, desserts, entrees, pastry, cakes, etc.

Sewing and Dressmaking

Course 1.—The common stitch forms, seams, bands, button-holes, placquets, patching, piping, binding, pleating, etc. Whitewear: measurements, cutting, fitting and making of corset covers and underwear, machine stitching. Night dresses and drop skirts; taking measurements, cutting, fitting, and making.

Course 2.—Open to those who have taken Course 1, or prove themselves proficient in the work covered by that course.

Shirtwaist suits: a suit of practice material, taking measurements, cutting, basting, fitting and hanging, one pupil fitting another. The making of plain suits to fit one's self; two designs selected by the pupil and made in paper. All possible practice in taking measurements.

Advanced dressmaking. The pupil will make her own designs on paper. Only moderately fancy dresses will be made.

Millinery

Course 1.—Wire shapes and covering of the same with muslins, buckram shapes covered, making bands, lining hats.

Course 2.—Copying shape from model and from picture, making draped toque, making plain covered hat, bindings, folds, trimming.

IV.—Art Department

Certificates will be given at the end of the school year for each subject in which the pupil has attained the required degree of proficiency.

The instruction in this department is, of necessity, largely individual, and while ability and application will accomplish a great deal, pupils are urged to give as much time as possible to the work.

I. DAY COURSES

The following classes are offered:

Drawing from the cast; water-colour painting, (still life, landscape, and figure); oil painting, (still life, landscape and figure); illustration, in all mediums, including pen drawing; clay modelling; arts and crafts; tone drawing in charcoal; pastel painting; wood carving; china painting; pencil sketching from nature; perspective,

elementary and advanced; composition and design, elementary and advanced; art history, (assigned reading only).

The above work requires from two to four years. Pupils undecided as to what special branch of art work they will devote themselves are recommended to take as much of the above as possible before specializing.

II. EVENING COURSES

Freehand Drawing

(Charcoal, pencil and crayon)

Course 1.—Drawing from the cast, 10 studies.

Course 2.—Drawing from antique, 8 busts or figures.

Course 3.—(Open only to those who have taken Courses 1 and 2 or their equivalent). Drawing from life (draped figure).

Industrial Design

Course 1.—Laws and principles of ornament, harmony of colour, historic ornament, the conventionalization of natural plant forms, original elementary design.

Course 2.—Study of historic styles, development of type forms in different styles, original design.

Course 3.—Advanced and applied design.

Modelling

Course 1.—Elementary course for beginners. Study of natural forms, (flowers, fruits, etc.).

Course 2.—Modelling for professional purposes related to the student's occupation.

Course 3—Advanced modelling.

China Painting

A course based on conventional designs made by the pupils themselves.

III. SATURDAY MORNING COURSES

These classes are designed to meet the requirements of Public and Separate School pupils and teachers. Hours 9.30 to 12 o'clock.

Courses offered.—Freehand drawing, as above. Painting in water-colour and pastel. Elementary design.

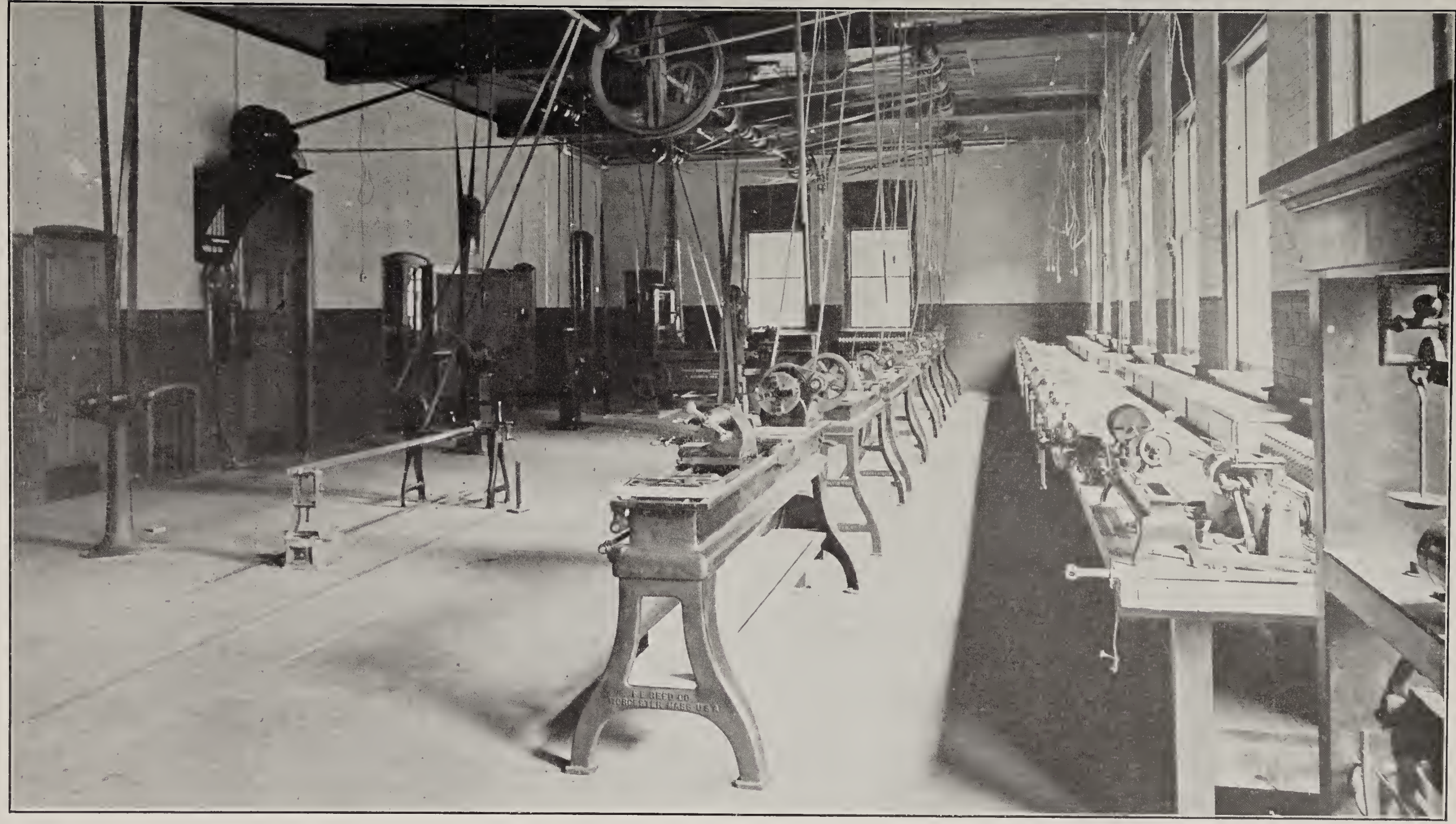
Fees

For Day Courses in Art the fees are as follows:

Two half-days per week	$1 00 per month.
Three to five half-days per week	2 00 per month.
Five half-days to five days per week	3 00 per month.
Saturday morning class	50 per month.

For Evening Courses in Art the fees are as follows:

One evening per week	$0 50 per month.
Two evenings per week	1 00 per month.
Three evenings per week	1 50 per month.



Industrial, Technical, and Art Schools, Hamilton—Machine Shop

For all other day classes the fees are $1.00 per month for residents of the city, and $5.00 per month for non-residents.

For all other evening classes the fees are $1.00 per month for residents and $3.00 a month for non-residents, and are payable by the term in advance on October 1st and January 1st.

Attendance

In common with other schools of this type our evening attendance largely exceeds our day attendance, and this condition is likely to persist, although probably the ratio will diminish as the advantage of the more comprehensive day course becomes better known. Undoubtedly there is considerable prejudice against manual employment, and many parents who are in a position to send their sons to school from, say, fourteen to sixteen years of age prefer to educate them for what is familiarly known as a "clean shirt job." So urgent is the demand for labour in these prosperous times that the boys themselves are tempted to leave school by the prospect of immediate earnings. From time to time, too, employers send us requests for pupils.

It is pleasant to record instances of the marked success of our pupils. One lad of nineteen, who spent a year in the day classes and another year in the evening classes, is now earning $18 per week as foreman in the Ontario Lamp & Lantern Company. A younger boy, who has just completed his three years' day course, this summer received an appointment in the physics laboratory of the meteorological department, Toronto, at an initial salary of $600 per annum, with prospects of a substantial increase.

Rather more than a year ago I issued a circular to parents of the Entrance candidates, in which I made an effort to form a class of girls to take a course to include English, mathematics, sewing and dressmaking, cookery, and freehand drawing. The response was discouraging, but I succeeded in forming a class in the last three subjects, which I hope will grow steadily.

With a relatively small day attendance arises a problem in organization—that of procuring employment for the teachers throughout the whole day. This has been solved by admitting Collegiate Institute and Public School Commercial classes for manual training, household science, and art.

Evening Courses

	Enrolment.	Average Attendance, Sept. 30th—Oct. 25th.
Total	340	176.3
Architectural Drawing	30	14 9
Art	29	13.8
China Painting	13	11.0
Cookery	48	16.0
Dressmaking	39	13.7
Whitewear	36	13.9
Electricity	36	16.3
Forge Shop	16	5.4
Machine Shop	33	15.2
Mathematics	42	29.8
Millinery	13	6.7
Mechanical Drawing	53	23.9
Woodworking	28	20.1

Note.—The pupils enrolled in the respective subjects do not take these subjects every evening; this accounts in large measure for the striking difference in the figures entered in the two columns.

Day Courses

Boys	36
Boys (part-time)	5
Girls	14
Art	32
Art (Saturday morning class)	41

General Remarks

One means we adopt to interest the general public is holding an exhibition of work every year at Easter. These exhibitions are well attended, and fully reported in the local press.

Local manufacturers have always shown a willingness to allow our boys to visit their plants. The Hamilton Branch of the Canadian Manufacturers' Association has a standing committee on Technical Education. For the past two years the Branch has given us an annual grant of $100 to be expended in magazines and prizes, and this grant has been supplemented by cash donations for prizes by two local manufacturers.

I have discussed with the secretary of the local Branch of the Manufacturers' Association the feasibility of organizing part-time classes for the younger employees in city shops, and he has promised to submit the matter to the technical education sub-committee at its next meeting. To make these classes successful there should be practically unanimous action on the part of the employers. It is probable, however, that the organization of these classes might draw from our present day attendance.

Some time ago I addressed the local Trades and Labour Council, and afterwards listened with much interest to very diverse expressions of opinion on the relation of the school to labour interests. While most of the speakers heartily commended the work of the school, others found fault with the unsatisfactory representation of organized labour on the advisory industrial committee.

In my opinion the prospects, especially as regards the evening classes, were never better than at present. This fall I have sought to ensure the stability of the evening classes by requiring fees to be paid quarterly in advance, with a view to carrying the faint-hearted over the initial period of discouragement at the results achieved in the first month or two. Diploma courses, as outlined in this year's "Announcement," appear to have appealed successfully to a good number of pupils, and it is hoped will encourage them to take a wider course than they would otherwise do. I am also requiring the teachers to give more oral instruction than they have done heretofore. All these changes give promise of good results.

Practically all our evening classes are now well attended. Perhaps the least promising is the class in forging, which has always been numerically weak. Drop-forging and welding by electricity, the power hammer, and the use of compounds, such as thermite, are superseding forging by manual labour. In the future few young men will take up blacksmithing as a means of livelihood; instruction in this subject will, however, be of value because of the knowledge it gives of the properties of iron and steel, and will have to be followed by a chemical and microscopic study of iron and iron alloys.

Special Text-books

Mathematics.

Workshop Mathematics, by F. Castle. The Macmillan Co. 2 parts, each 40 cents.

Arithmetic and Algebra up to, and including, simultaneous equations of several unknowns. Part 2 contains tables of logarithms and anti-logarithms.

Shop Problems in Mathematics, by Breckenridge, Mersereau & Moore. Ginn & Co., Boston and New York. Cloth, $1.00.

Contains problems in Carpentry, Pattern Making, Foundry Work, Forging and Machine Work

Applied Mathematics, by H. E. Cobb. Ginn & Co. Cloth

Useful for reference; contains logarithmic and trigonometrical tables, and a bibliography of Applied Mathematics.

Practical Calculations for Engineers, by C. E. Larard and H. A. Golding. Charles Griffin & Co., London. Cloth

An advanced text, as the title implies.

Contains an explanation of slide rules of various types, specially ruled paper for graphical work, etc.

Physics.

A First Course in Physics, by Milliken and Gale. Ginn & Co. Cloth

Treats of general principles, Heat, Electricity, Sound, and Light, stressing industrial applications.

Applied Mechanics, by Duncan. The Macmillan Company. Cloth, 2s. 6d.

Applied Mechanics, by T. Cryer and H. G. Jordan. J. Heywood, Manchester. Cloth, 3s.

Practical Geometry and Mechanical Drawing.

Practical Plane and Solid Geometry, by J. S. Rawle. Simpkin, Marshall, Hamilton, Kent & Co., London. Paper, 1s.; cloth, 2s.

Notes on Mechanical Drawing, by F. Mathewson. The Taylor-Holden Co., Springfield, Mass.

Eighty-six loose leaves in a canvas binder, $1.25. The leaves can be bought in quantities as desired.

Machine Construction and Design, by F. Castle. The Macmillan Co. Limp cloth, $1.00.

Principal topic, Steam Engine Detail.

Theoretical and Practical Graphics, by F. E. Willson. The D. Van Nostrand Co., New York. Cloth,

An advanced work, containing chapters on Descriptive Geometry, Shades and Shadows, and Perspective. Appendix gives 60 alphabets. A valuable book of reference for the teacher.

Woodworking.

Bench Work in Wood, by W. F. M. Goss. Ginn & Co. 12mo., cloth, 70 cents.

Wood Turning, by G. A. Ross. Ginn & Co. 12mo., illustrated, $1.00.

Forging.

Forge Practice, by J. L. Bacon. Wiley & Son, New York. Cloth, $1.50.

Contains a course of about 60 exercises.

Machine Shop.

A Handbook for Apprenticed Machinists, by O. J. Beale.

Published by the Brown and Sharp Mfg. Co., Providence, R.I., for the use of their apprentices. Cloth, 50c.

Building Construction.

Building Construction for Beginners, by J. W. Riley. The Macmillan Co., Cloth, 2s. 6d.

Building Construction and Superintendence, by Kidder. W. T. Comstock, New York. Three vols.

The authoritative American text on the subject. An expensive but valuable reference work.

Industrial and Art Schools, London

LONDON

DAY AND EVENING INDUSTRIAL AND ART SCHOOLS

Advisory Industrial Committee

Chairman: W. W. Gammage

MEMBERS OF THE SCHOOL BOARD

E. R. Dennis, Manufacturer of Iron and Wire Goods.
W. W. Gammage, Florist.
M. F. Irwin, Manager, McClary Mfg. Co.
W. J. Teasdall, M.D., Physician.
Dr. A. J. Wyckoff, Dentist.
P. J. Mugan, M.D., Physician.

APPOINTED MEMBERS

L. H. Martyn, Contractor.
E. E. Nugent, Foreman, Wood Planing Mill.
A. J. Palmer, Superintendent, Empire Brass Co.
Thos. Treleaven, Superintendent, G. T. R. Car Shops.
Arthur W. White, Mfr. of Threshing Machines & Traction Engines.
F. E. Leonard, Manufacturer of Boilers and Engines.

Staff

Principal and Academic Subjects of Day School: H. B. Beal.
First-class Certificate. Twelve years Principal Public School, London. Summer session, Columbia University, 1911. Salary, $2,100.00.

Machine and Forge Shop Practice: Thos. B. Van Brocklin.
Fifteen years' experience in machine and forge shop of large industrial plants. Three years in attendance in Hamilton Technical School in Mechanical Drawing and Mathematics. Substituted in Hamilton Technical School in Machine Shop and Mechanical Drawing. Salary, $1,200.00.

Cooking and Home Economics: Miss Agnes W. Stewart.
First-class Certificate. Graduate of Macdonald Institute, Guelph. Four years' successful experience teaching in Toronto Public Schools. Salary, $800.00.

Woodworking: Thos. F. McCracken.
Twenty years' experience at the woodworking trade. Has held responsible positions with several firms covering the important branches of the trade. Two and one-half years foreman at Dominion Office and Store Fixture Co.; also did their designing and detailing. Salary, $3.00 per afternoon.

Design: Miss M. Mulveney.
Supervisor of Drawing, city schools, Second Class Certificate. First Year, Pratt Institute. Salary, $3.00 per afternoon.

Dressmaking and Sewing: Mrs. P. Cooke.
Ten years' experience as a dressmaker. One year in charge of Dressmaking Department with Small & Ingram. Salary, $3.00 per afternoon.

Pattern Making: Joseph A. Childs.
Fifteen years' experience as Pattern Maker. Several years' experience in Foundry. Conducts general pattern making business, doing a wide range of work. Salary, $3.00 per evening.

Mechanical and Architectural Drawing and Mathematics: E. V. Buchanan.

Associate of Glasgow and West of Scotland Technical College. Technical and Laboratory Assistant, Glasgow Electrical Department. Inspector and Draughtsman in Electrical and Mechanical Engineering Construction for Messrs Sayers & Caldwell, Glasgow, Scotland. Instructor in Clyde Bank Technical School in Drawing and Mathematics, 1908-9. Instructor in Evening Classes, Glasgow Technical School, 1907-8. At present Waterworks and Electrical Engineer for London, Ont. Salary, $3.00 per evening.

Architectural Drawing and Building Construction: J. P. Wallace.

Graduate of Detroit Technical School. One year chief draftsman and structural engineer, Baxter & Odell, Detroit. Two years chief draftsman and structural engineer, Donaldson & Weir, Detroit. Two years chief draftsman and designer for Dennis Wire and Iron Co., London. Salary, $3.00 per evening.

Art and Design: David Wilkie.

Graduate South Kensington Art School, 1901. Philadelphia Academy of Fine Arts, 1896-7. Ontario Provincial Art School certificates in Industrial Design, Shading from Flat Design, Drawing from Flowers, Practical Geometry, Freehand Drawing, Shading from the Round, Advanced Perspective, Original Industrial Design, Memory, and Blackboard Drawing. Salary, $3.00 per evening.

Practical English: George Copeland.

First-class Certificate. Eight years' successful experience as teacher. Salary, $3.00 per evening.

Dressmaking and Sewing: Miss L. Ling.

Twelve years' practical experience as a dressmaker. Five years in charge of Dressmaking Department Smallman & Ingram, Limited. Graduate of London Cutting School. Salary, $3.00 per evening.

Dressmaking and Sewing: Miss O. Carson.

Eight years' experience as dressmaker. Three years in charge of Dressmaking Department, Gray & Parker. Course in cutting at Mrs. Frank's Cutting School. Salary, $3.00 per evening.

Millinery: Miss Skuse.

Six years' practical experience as milliner. Head Milliner for Smith Millinery Co., London. Salary, $3.00 per evening.

Principal's Report

I. EVENING SCHOOL

The classes in practical work are arranged so as to have not more than twenty pupils in each. In English, mechanical and architectural drawing, art, and design, and home economics, the classes are in some cases combined.

The sessions begin the first Monday in October and close the last week in April. Each session consists of two terms; the first term opening the first week in October and closing the last week in December; the second term opening the second Monday in January and closing the last week in April. The classes are held on Monday, Tuesday, Wednesday, and Thursday evenings from 7.30 to 9.30 o'clock.

Time Devoted to Subjects

At present, as far as possible, the lessons in the practical courses are of two hours' duration. The time-table is arranged so as to give two full evenings each week; that is, four hours, to each of the practical subjects. The subjects such as Mechanical Drawing, Architectural Drawing, and English, taken as supplementary subjects with the practical work, require one evening per week, of two hours. In this way most of the men and boys attend three evenings each week. We do not encourage any but special cases to attend more than three evenings per week, The women and girls' classes, Dressmaking, Millinery, and Woodcarving

each require two evenings of two hours each per week, and Cooking and Home Economics together require the same. Of this time, three hours are devoted to Cooking and one hour to Home Economics each week. The majority attend only two evenings per week.

I. Courses for Men and Boys

Group 1, Machine Shop Practice, Forge Shop Practice, Woodworking, Pattern Making, Building Construction.

Group 2, Mechanical Drawing, Architectural Drawing.

Group 3, Mathematics and Practical English.

NOTE.—Classes in Heating and Sanitary Engineering, Wood Carving, and Sign Writing open in January, 1913.

The object of the school is mainly to give those already employed in the trades an opportunity of broadening their mechanical training and to make themselves more efficient workmen; to supplement the imperfect and highly specialized training of the modern shops by giving machine hands, helpers, and apprentices, an opportunity of gaining practice in a greater variety of work than would be open to the individual under the modern system of machine production; to teach the theory and scientific principles underlying the trades; to give a practical knowledge of the making and use of mechanical drawings and blue prints; to improve the general knowledge of the mechanic by giving him a practical knowledge of the correct use of English in letter writing and such ordinary business forms as he will likely require to use and by encouraging the reading of good literature.

The work has been arranged in courses to guard against the tendency of the students to confine their efforts to the mechanical work. Mechanical or architectural drawing is compulsory for those taking shop work. Shop Mathematics is taken in connection with the practical work, and students are encouraged to take the Special Mathematics course. Each course contains, as far as possible, the essentials for the trades represented by the subjects in Group 1. The School has, so far, been successful in the introduction of this feature. A very large number of the students are taking the work in correlated groups. The effects cannot fail to be broadening and beneficial.

The full courses of study for each department have not yet been definitely fixed. It was deemed advisable to make the work of the first year of a tentative nature and general as well as introductory in character. The work will be adapted, as far as possible, to the requirements of the local industries. It is the present intention to specialize the work after the first year so as to cover in a two years' course in each group, as far as possible, the essential features of a single trade or rather of a related trade group in a broad and comprehensive manner. It will not be a trade school in the restricted sense of the term. In constructing the courses the local manufacturers will be consulted. Thus, the local requirements together with such other essentials as are generally required of the resourceful artizan will constitute the work of each course.

II. Courses for Women and Girls

Group 1, Dressmaking and Millinery.

Group 2, Cooking and Home Economics.

Group 3, Practical English.

Industrial and Art Schools, London—Woodworking

The object of the courses for women and girls is largely domestic. It aims to prepare those engaged in the industries for the duties which will confront them in their own homes. While this aim has been emphasized the industrial element has not been overlooked.

II. DAY SCHOOL

I. Courses for Boys

English, Grammar, Composition (including business forms), Spelling, Reading, Literature, Penmanship, Mathematics, Arithmetic, Shop Mathematics, Mensuration. Geography, History and Civics, Mechanical and Freehand Drawing, Materials, Physical Culture (carried on under the instructor for the Y.M.C.A., by special arrangement), Machine Shop Practice, Forge Shop Practice, Woodworking.

NOTE 1.—The class of students we have will not take Algebra the first year, and the Elementary Geometry will be covered in the Mechanical Drawing Course.

NOTE 2.—We expect to add electrical work next year. Our plan in the practical work is to let the pupils take all the practical courses until it is determined which they are best fitted for and then to specialize on the course selected.

II. Courses for Girls

English Grammar, Composition (including business forms), Spelling, Literature, Arithmetic, Mensuration, Geography, History, and Civics, Materials, Penmanship, Physical Culture and Hygiene, Drawing, Freehand and Design, Dressmaking and Millinery, Cooking and Home Economics.

The classes are held from 9.00 to 11.45 a.m. and from 1.30 to 4.00 p.m. during the same terms as the Public Schools and Collegiate Institute.

No fees are charged in the Day Industrial School.

III. Part-time Co-operative Courses

Last July we interviewed a number of local manufacturers to obtain their co-operation in a plan whereby the boys would work in pairs alternate weeks in the shops and school. We called only on manufacturers where the nature of the work was such as to require skilled mechanics. We found them most willing to co-operate with the school, and we could place fifty boys in such positions were the boys available.

At present we have two boys placed with The Dennis Wire & Iron Co. Below is a letter from the manager of this firm in answer to our inquiry as to how the plan is working out.

So far as the boys' school work on the alternate weeks is concerned, we find that they are keen for it and have had no difficulty in keeping up with the other members of the class who are attending school full time.

We feel quite confident that the co-operative part-time plan will be an important feature of our vocational educational system and that it will prove a great benefit to many who require to be earning at an early age, but who are anxious to prepare themselves for a useful industrial career.

The following is the letter referred to above:

Dennis Wire and Iron Works Co., Ltd.

Mr. H. B. Beal,
Principal, Industrial and Art School, City.

Dear Mr. Beal,

Referring to your inquiry regarding the progress our part-time boys are making here, we beg to report that we took this matter up thoroughly with our foreman who has charge of the department in which they are working, and we are very pleased to be able to say that he is quite well satisfied with the work they are doing, as well as with their conduct and the spirit they are manifesting.

One thing our foreman notices is that the boys take a much more intelligent interest in their work and learn their duties more quickly, and perform them more satisfactorily than boys we have had heretofore who have come to us after putting in a year or two on un-educational labour, such as driving delivery rigs, running errands, and doing similar work.

He is much pleased with the serious way in which the boys take hold of their work and the keen desire they show for improvement. It appears to us that the spirit and attitude towards their work that they acquired at the school is no less valuable than the practical training you are giving them.

You may also be pleased to know that the young man who was driving the delivery rig for the Vulcan Foundry Co., and whom we persuaded to take up night courses at the school, when they started in September, has given up that work and has now entered our shop as an apprentice in our ornamental metal department. His contact with the school has made him see the advantage of foregoing the little extra money he can make doing manual work and of starting in to learn a trade so that his earnings will be larger a little later on.

The best answer I can give to your question as to how we are satisfied with the part-time system is that we will be glad to take on six more boys on this plan as soon as you can send them to us.

Yours very truly,

E. R. Dennis, Manager.

Attendance

EVENING COURSES

	Enrolment.
Machine and Forge Shop Class (2 classes)	19
Woodworking and Pattern making (2 classes)	19
Building Construction	13
Mechanical Drawing	30
Architectural Drawing	25
Art and Design	21
Mathematics (special)	10
Practical English	23
Dressmaking (3 classes)	58
Cooking and Home Economics	20
Millinery	14
Average nightly attendance	87
Individuals attending—Men and Boys	78
Women and Girls	93
Total	171

Note: The average attendance of 87 for four nights per week, as compared with 59 for last term for three nights per week, shows a gratifying increase. In comparing the average attendance with the enrolment, the fact that the majority take work requiring attendance on only two nights out of four must be considered. Only the names of those are included who have attended sufficiently to justify the conclusion that they will complete the term. The addition of several extra subjects will, it is anticipated, increase the enrolment and the attendance.

Industrial and Art Schools, London—Machine Shop

DAY COURSES

Enrolment:		Average attendance first three weeks	
(*a*) Boys—Full-time	21	in October	20
Part-time	2		
(*b*) Girls—Full-time	15		
Part-time (taking Dressmaking and Cooking only)	4		
		Average attendance first three weeks in October	12
Total	42	Average for first three weeks in October	32

Accommodations

The Industrial Classes for the first term were held in the new Alexandra Public School. It is a thoroughly modern building and the rooms used for industrial classes are specially suitable as to lighting, ventilation, and accommodation for the work. In order to provide for the large number of classes made necessary by the increased registration for the second term and by the establishment of the day industrial classes, the adjoining Colborne Street School building has been specially equipped. We are at present using eleven rooms for industrial purposes. These include three lecture rooms and the following:—

The Machine Shop. Work is carried on in a special basement room used exclusively for Industrial work. It is lighted by electric lights of 500 watts and fitted with bench space for twenty pupils. Each space is lighted by individual drop electric light. A drop light is also placed over each machine. Each bench is supplied with a machinist's vise and a full set of bench tools. The following power machinery is also installed: One 16 in. shaper, one 13 in. turret lathe 7 ft. bed, two 13 in. lathes 6 ft. bed, one 11 in. lathe 5 ft. bed, one 20 in. drill, one hack saw, one floor emery grinder, one grinder. Each machine is fully equipped with the various attachments and tools. (A milling machine will likely be installed at an early date.) The check system for special tools such as is used in the modern machine shops is used.

The Forge Shop. Work is carried on in a basement room specially laid out for the work and used exclusively by the Industrial students. It is lighted with electric lights of 500 watts. It is fitted with ten Buffalo Down Draft forges, ten anvils, bench space and lockers, together with all the necessary tools and appliances for forge shop work.

The Woodworking department is carried on in a large room specially lighted and fitted up for the purpose. The following power machines are installed: One 24 in. surface planer, one universal woodworker with safety head, one variety saw, one band saw, three wood-turning lathes 13 in. swing 7 ft. bed, one double grinder, fifteen special heavy 6 ft. benches are provided with complete sets of tools. All the special and general tools required for woodworking and pattern making are provided.

A basement class-room lighted with electric lights of 500 watts is used exclusively for Dressmaking. Large cutting tables, ten sewing-machines, and all the necessary appliances and accessories have been provided.

A regular unseated class-room specially lighted is used for the Millinery class. Special sewing tables, shears, and pliers are the only equipment required.

The Domestic Science room with all the necessary appliances is used for the evening classes. This room is lighted with electric lights of 500 watts.

A Room 38 ft. x 32 ft. is used exclusively for Mechanical and Architectural Drawing. It is lighted by indirect electric lighting of 2,000 watts. Special drawing tables and special black-boards have been provided. Each student is supplied with individual drawing boards, T squares, 30° triangles and 45° triangles, protractors, scales, and curves.

One of the ordinary unseated class-rooms is at present used for Art and Design. It is provided with electric lights of 500 watts. Special easels, tables, and drawing boards have been supplied. The regular drawing forms and casts are used.

Value of Equipment

Machine Shop	$2,500 00
Forge Shop	1,350 00
Woodworking and Pattern making Shop	1,800 00
Mechanical and Architectural Drawing	250 00
Art and Design	150 00
Cooking	500 00
Dressmaking	425 00
Millinery	50 00
	$7,025 00

Adolescent School Attendance Act

The members of the School Board and especially those on the Advisory Industrial Committee, were impressed with the importance of *The Adolescent School Attendance Act* and decided to give it a trial in London. Their efforts to secure its adoption have proved to be successful and it will go into effect on January 1st 1913. Its operation will be under the charge of a committee consisting of the chairmen of the Board and the Advisory Industrial Committee, the principals of the Collegiate Institute and the General Industrial and Art School, and the Public School Inspector. The Board's method of procedure was as follows:

The attention of the editors of the local newspapers was called to the Act, and, after discussion they published editorials on its importance. A special committee of the Board of Education was then named to report on the advisability of making the Act operative in London. The committee's report, which was favourable, was adopted. The necessary advertisement of a special meeting at which to pass the By-law was inserted in the city papers, and on Friday, November 8th, the meeting was held when it was decided to put *The Adolescent School Attendance Act* in force in London on the first of January, 1913.

Those interested in the movement have taken a great deal of trouble to discuss it with any body of citizens likely to be interested in the question. They consulted the Trades' and Labour Council and also the members of the Builders' Exchange. It was found that many, when told that it was intended to raise the age of compulsory attendance to sixteen years, were at first inclined to look upon the proposal as likely to cause hardship; but, when the discretionary powers were explained to them and it was pointed out that by attending evening classes the adolescent was meeting the requirements of the Act, their opposition at once disappeared. It is very important that where the enforcement of this Act is contemplated, means be taken to have its provisions made plain to the people. Otherwise, ignorance of its provisions may lead to much opposition.

Industrial and Art Schools, London—Mechanical and Architectural Classes

The Adolescent School Attendance Act should be a great aid. Wherever vocational classes are organized there will be many who will avail themselves of the evening classes. But there is still a class of boys who walk the streets at night and work at an uneducative job during the day. This class will later become the unemployables of the industrial world, and yet they are the most difficult class to induce to attend evening classes. The Act gives authority to compel this class to attend the evening industrial classes, and it will do much to extend the benefits of Industrial Education to those who are in need of effective training but are least alive to the necessity of self-improvement.

General Remarks

The attitude of the public press, the manufacturers, organized labour, and special organizations, such as the Builders' Exchange, and of the public in general is one of hearty approval and support. The local newspapers, without regard to political leanings, have devoted unlimited space to forward the movement. The local manufacturers, without a single exception so far as we know, and we have communicated with most of them, are ready to co-operate in any way to assure its success. Practically every factory in the city has our display cards posted in conspicuous places, and most of these bear the signature of the firm recommending the courses. At the opening of each term they have distributed our literature to their employees. No local firm has, so far, declined to do this.

We know of several cases where manufacturers are using their personal influence with their employees to induce them to attend the evening industrial classes, and Messrs. George White & Sons, one of the largest manufacturers in the city, are paying the fees of all of their apprentices who will avail themselves of the classes.

The Trades and Labour Council has formally endorsed the school. To show their interest, they visited it in a body and afterwards passed a strong resolution calling on its members to promote its usefulness by procuring pupils for the classes.

The attitude of the general public is one of approval. It is a matter of common occurrence for the officials of the school and the members of the Advisory Committee and the Board of Education to be congratulated on the establishment of an Industrial School in London.

The prospects for the extension of Industrial education in London are very bright. The attendance, we anticipate, will increase from year to year. There is, at present, a movement on foot to have all the trades represented in the Builders' Exchange adopt the rule of requiring an Industrial Day School Diploma as a qualification for apprenticeship and further of requiring the apprentice to attend the Evening Industrial classes during his apprenticeship. We anticipate that we shall experience little difficulty in extending this practice to other trades in the city. The next step which we will request them to take is to promote apprentices from year to year on reports from the Evening Industrial School of satisfactory work in the classes. This plan is at present in operation in the Grand Trunk shops in Stratford. The Manufacturers whom we have consulted think the idea an excellent one, and when we have our first graduating class of the Day Industrial School ready for positions we hope to inaugurate some definite plan along this line.

We have had numerous inquiries from other school boards and frequent visits from trustees and others interested in the movement; and, judging from their impressions and remarks, vocational schools will shortly be very generally introduced in Western Ontario.

So far as London is concerned, vocational education for industrial pursuits has come to stay. It is supplying a need which has long been felt to exist but which hitherto has been ministered to in no other way.

Suggestions

The following suggestions have been gathered from our own experience in London and from a careful consideration of the vocational schools we have visited and the experience of those who are connected with them:

The Public Press

There is no class in the community readier to champion the cause of Industrial education than newspaper editors. Through them, much may be done to prepare the public for the introduction of Industrial Schools. Newspaper articles giving the experience of other places may arouse local pride and lead to a demand for the establishment of such schools. At the same time, the newspaper editor, being an exceedingly busy man, will appreciate being supplied with data on Industrial education which he has neither time nor opportunity to collect for himself. To supply such data is an important part of the work of those interested in the introduction of vocational schools and should precede as well as follow their establishment.

The Manufacturer

As a rule, the average school man has held aloof from the manufacturer. The successful business man, on the other hand, has been prone to criticise the school system and, in many cases, rather unfairly. But to make Industrial education effective, the business man must be interested. This can be done in no better way than by actual contact. Our experience has been that the task is much easier than most school men imagine. The majority of men of affairs do not hesitate to recognize the great need and the importance of the movement and are more than willing, when the case is presented to them, to further it by any method that is pointed out to them. But to accomplish anything it is necessary to go to them with a *definite proposition.* Ask them if they will do "so and so" and in most cases they will readily agree. Do not expect them to think out a plan of operation. We have found it a good plan to get them to put up our display cards in their shops and to distribute our literature in their *pay envelopes.* They have also on request given newspaper interviews endorsing the Industrial education movement.

The Labour Organizations

The fact that labour organizations have long advocated vocational education should be taken advantage of in approaching any local organization. We believe that much misunderstanding may be avoided and much assistance gained by soliciting the co-operation of the labour organizations.

The General Public

The interest and support of the public at large is one of the essential factors in the success of vocational schools. There is little difficulty in persuading the average citizen that Industrial education is a good thing. He will tell you at

Industrial and Art Schools, London—Dressmaking

once that it is the very thing that the boys and girls of the rising generation require. The difficulty, however, is to bring the matter to his attention. The question of gaining the support of the general public resolves itself into one of bringing them into contact with it. The following means have been tried here with considerable success:

1. Arranging with the manufacturers for a number of their employees to visit the school on a certain night.
2. Having a fixed night each month when the general public is invited through the public press to visit the school.
3. Holding general receptions and exhibitions of work.
4. Keeping the work and progress of the school constantly before the public through the local newspapers.

Vocational Guidance

The thoughtful parent realizes the difficulty that confronts him when the time arrives for his child to choose an occupation in life. This is at once the opportunity and the duty of Day Industrial Schools. They should provide a sufficient variety of mechanical work to give scope for the development of the natural aptitude of the pupils, and the instructors should be constantly on the alert to discover the calling in which the pupil shows particular aptitude, and should advise the pupil and parent as soon as this is discovered. Education can bestow no greater benefit upon the individual than first to assist in the discovery of his natural vocation in life, and then to proceed to prepare him for that vocation in a broad and intelligent manner.

Hitherto our educational system has done this for the small minority that enters the professions. Shall we now open the door of opportunity to the great majority who, by the fact of their social position, are most in need of vocational guidance?

In order that vocational guidance may be effective much information relative to the trades must be at the disposal of the teacher. He should be able to present intelligently to the parent and pupil the requirements both physical and mental of the various occupations, the remuneration and opportunities for advancement offered by each, and the best method of training for any of the standard vocations. This will require the collection of much information and should be at least Provincial wide in its scope. The most fruitful sources of information are the vocational bureaus, and the Provincial Government would render a great service if it collected such information and placed it at the disposal of the teachers.

Posters and Special School Forms

In London a large amount of literature has been prepared and extensively circulated in order to acquaint the public with the facilities offered and the plans proposed.

The following partial list is given here:

1 A personal letter sent to:

(*a*) The parents of every pupil who wrote on the High School Entrance Examination.

(*b*) The parents of pupils whose names had been supplied by the Manual training teacher as especially fitted for mechanical pursuits.

(*c*) All pupils of Form IV.

2. Various folders, copies of which were to be obtained from the principal.

3. Folder on the "part-time" plan.

4. Reply post cards containing:

(*a*) Applications to attend Day School.

(*b*) Applications to attend Evening School.

5. Large posters 18 inches by 24 inches, containing:

(*a*) Announcement of Evening Courses.

(*b*) Announcement of Day Courses.

The contents of some of the foregoing are reproduced below; they may prove suggestive to other advisory committees, and especially to those localities that are about to organize industrial classes.

LETTER TO PARENTS FROM THE CHAIRMAN OF THE ADVISORY INDUSTRIAL COMMITTEE

London, April 16th, 1912.

To the Parents of the City:—

The object of this circular is to determine the number of parents in the city who would send pupils to a Day Industrial School, should such a school be opened in September next.

Industrial Education has now become a world-wide movement. Not many years ago, through the apprenticeship and small factory system, a boy could become a good all-round mechanic in the shop. This is no longer possible. Under the modern factory system, a trade is no longer taught in its entirety. If the boys of the rising generation are to hold their own with the skilled workman, trained, under the more effective European systems, some form of practical instruction must be given them outside of the shops. This responsibility has now been laid at the door of our School System. It is to meet this very real and pressing demand that Industrial Schools are being established.

The years from 14 to 16 have become known as the "wasted years" of a boy's life, from the fact that he is of little use in a trade until he is 16 years of age. As a result, a great many of our boys, who leave school about 14 years of age, drift about in the various forms of unskilled employment, and later find themselves without a trade, and so destined to fill menial and poorly paid positions, to become "the hewers of wood and drawers of water" of the industrial world.

It is to save the rising generation from such a fate that it is proposed to establish a Day Industrial School. The aim of this school will be to give the boy a thorough grounding in the practice and principles of the trade group in which the trade which he intends to follow lies. The practical instruction will be given by those who have a first-hand knowledge of the conditions and requirements of the Industrial World. Successful mechanics will be selected as instructors in the shop practice. It will provide a preparatory Trade School course; at the same time, the cultural element will not be overlooked. "We need skilled workmen, but we also need well-trained citizens."

In the course for girls, while the same industrial methods will be followed in the practical work, as in the courses for boys, yet the aim will be largely domestic. The object of the course will be to fit them to discharge intelligently the duties that will confront them in the home.

Our School System has for many years provided for those who were to enter the professions. Shall we now extend to that great majority of our boys and girls who will enter the trades, an opportunity to prepare themselves for a successful career? It is for the parents of the city to decide, as the establishment of a Day Industrial School at the present time will largely depend on the response to this circular.

If you have a boy or girl whom you wish to send to the Industrial School, kindly fill in and mail the inclosed application form. As the accommodation will be limited, you will do well to send in your application without delay.

Yours faithfully,

W. W. GAMMAGE,

Chairman of Advisory Industrial Committee

Industrial and Art Schools, London—Art and Design

(LARGE POSTER FOR SHOPS)

LONDON
Industrial School

EVENING CLASSES, 1912-13
——Re-open October 1st.——

COURSES:

Machine Shop Practice.	Architectural Drawing.
Forge Shop Practice.	Dressmaking.
Woodworking.	Millinery.
Pattern Making.	Cooking.
Building Construction.	Home Economics.
Mathematics.	Art and Design.
Mechanical Drawing.	Practical English.

ANY resident of the City who is fourteen years of age, and who does not attend day school, is eligible to attend the Evening Classes of the Industrial School. There is no entrance examination.

Circulars and application forms may be had at the office of this firm or at the Public Library.

The Principal will be pleased to give information or advice to any one interested. He will be in the Alexandra School (corner King and Colborne Streets) every class night, or at any other time by appointment. Phone 3800.

FALL TERM:
October 1st to December 20th.

SPRING TERM:
January 6th to April 30th.

We heartily recommend the Evening Classes of the London Industrial School to our employees.

Firm Signature.

(LARGE POSTER FOR GENERAL DISTRIBUTION)

INDUSTRIAL DAY CLASSES
FOR BOYS AND GIRLS

TO OPEN SEPTEMBER 3, 1912

For Boys:

Full Time Industrial Day Classes.
Part Time Industrial Day Classes.

For Girls:

General Home Economics Day Classes.

To provide for boys who are to enter the industries, and for girls who are to engage in home activities— what the Collegiate Institutes do for those who enter the Professions.

Any boy or girl who is fourteen years of age, and who has attained Fourth Form Standing in the Public or Separate Schools, is eligible to attend.

Circulars giving full particulars may be obtained at the Public Library.

The Principal of the Industrial School will be in the Alexandra School on Wednesday, Thursday, Friday, and Saturday evenings of the last week in August, to meet parents and applicants.

NO FEES WILL BE CHARGED THE FIRST YEAR.

(LARGE POSTER FOR GENERAL DISTRIBUTION)

REGISTER NOW FOR WINTER TERM.

LONDON
Industrial and Art School
EVENING CLASSES.

"Education for Efficiency."

COURSES:

Machine Shop Practice.
Forge Shop Practice.
Woodworking.
xPattern making.
Building Construction.
xHeating and Sanitary Engineering.
xWoodcarving.
xSign Writing.
Mechanical Drawing.
Architectural Drawing.
Mathematics.
Practical English.
Dressmaking.
Millinery.
Cooking.
Home Economics.
Art and Design.

Courses marked "x" are New Courses for Winter Term.

ANY resident of the City who is fourteen years of age, and who does not attend day school, is eligible to attend the Evening Classes of the London Industrial and Art School.

The Principal will be pleased to explain the courses to any one interested. He will be in the school, corner King and Colborne Streets, any Monday, Tuesday, Wednesday, or Thursday evening during the school term from 7.30 to 9.30. There is sure to be a rush for places in January.

If you are interested, call at the school or phone 3800.

Application Cards may also be had at the Public Library.

DAY INDUSTRIAL CLASSES FOR BOYS AND GIRLS from 14 to 16 years of age.

Don't leave it till January; register now.

An AFTERNOON ART CLASS will be opened in January.

WINTER TERM OPENS MONDAY, JANUARY 6th.

CARDS OF APPLICATION.—These cards are already addressed to the Principal. The applicant has only to fill in, stamp, and mail it.

Application for Admission to Industrial Day Classes

Pupil's Name ..... Date .....
Surname first

Address .....Age at last birthday .....
School the pupil is at present attending .....Present teacher.....
Grade in which the pupil is at present .....Principal of School.....
Course the pupil desires to take in Day Industrial School .....
Trade the pupil intends to enter after completing course .....

I desire that my ..... be entered as a pupil in the Day Industrial
Son or Daughter
School which it is proposed to open in September next. My present intention is that he should take the two year course and I expect him to enter a trade at the completion of the course.

Signature .....
Parent or Guardian

NOTE.—As the course for girls is mainly domestic, the intention of entering a trade is understood to refer to boys only.

LONDON INDUSTRIAL SCHOOL: APPLICATION FORM: EVENING CLASSES.

(Do *not* send fees with this card.)

Name in full ..... Date .....
Address ..... Age at last birthday.....
Occupation .....Name of Employer .....
Name of foreman under whom you work .....
The form you were in when you left school .....
The subject you desire to take (1) .....
(2) ..... (3) .....
Special purpose, if any, for taking the course .....
Remarks .....
.....

Signature of applicant.

NOTE.—It is important that every applicant should call and see the Principal as soon as possible after making application to arrange the subjects to be taken, as only certain combinations of subjects are possible. Mr. Beal will be in the Alexandra School Monday, Sept. 23rd, Wednesday, Sept. 25th, and Friday, Sept. 27th, from 7.30 to 9.30 each evening, and will be pleased to give information and assistance in selecting courses.

LEAFLET FOR GENERAL DISTRIBUTION)

London Industrial School

"Education for Efficiency"

▫ ▫ ▫

PROPOSED PART-TIME

Day Industrial Classes

▫ ▫ ▫

"EVERY WORKER AN ARTISAN"

To open September, 1912

Part-time Plan of Industrial Education.

We have made arrangements with a number of the leading local manufacturers to take a number of boys on a part time basis. The boy will work and go to school alternate weeks. By this means the boy will earn one weeks wages in two weeks and will continue his education along practical lines. We have only solicited the co-operation of industries that employed skilled mechanics. The school work will, so far as possible, supplement the shop work as well as provide a general education. Thus the boy will be laying a substantial foundation for a successful career in the industries.

The fact that in many cases it is a hardship and in some cases an impossibility for boys who are 14 years of age to attend school and thus not be earning a wage has given rise to the Part Time Plan.

It is the object of the Industrial School to place within the reach of every boy an opportunity of making a success in the industrial world.

Don't let your boy enter one of the "blind-alley" occupations to find himself at the age of twenty among the great army of "unemployables" —without a trade when the demand for skilled mechanics greatly exceeds the supply. Make a little extra effort and give your boy a chance. "A sound Industrial Education is an indestructible asset."

How to Make Application.

If you desire to take advantage of the PART-TIME PLAN fill in the inclosed card, stating what industry you desire to enter. Mark "Part-time Plan" on the card and mail it. You should then call and see the Principal of the Industrial School as soon as possible. He will give you the full particulars and introduce you to the firm where you can get the practical work you require. Mr. Beal will be in the Alexandra School on Thursday, Friday, and Saturday of this week and on Monday, Tuesday, and Wednesday of next week from 7.30 to 9 o'clock p.m. Do not delay if you desire to get a place as the accommodation is limited. All applications will be considered in the order in which they are received, and all must be in by Wednesday, July 24th.

FEES—There will be no fees charged the first year.

The following firms have consented to take boys on the Part-time Plan:

J. Darch & Son.
Dennis Wire and Iron Works, Ltd.
Lawson & Jones, Ltd.
London Advertiser (Job Dept.)
London Printing and Lithographing Co., Ltd.
London Concrete Machinery Co., Ltd.
McClary Mfg. Co.
Sherlock, Manning Organ Co.
A. Talbot & Co.

Several other firms have the matter under consideration.

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Boys who desire to engage with any of these firms on the Part-time Plan should apply to the Principal of the Industrial School—not to the firm direct. The Principal of the Industrial School will give letters of introduction to the boys who are eligible.

(A SMALL CARD FOR GENERAL DISTRIBUTION)

ART AND DESIGN CLASSES

AT THE

LONDON INDUSTRIAL SCHOOL.

Freehand Perspective; Object Drawing; Lettering and Industrial Design; Drawing from Flowers and Conventionalizing for Design; Shading from Flat and Round Examples; Drawing from Cast; Monochrome Painting, etc.

No skilled artisan is to-day in greater demand, none receive better pay or have more congenial work than the *first-class* illustrator and designer. The Department of *Art and Design* was opened in response to a large number of inquiries. It will, as far as possible, minister to the individual needs of the students. The school is fortunate in securing a teacher of the experience and ability of Mr. D. Wilkie to take charge of this department.

Art and Design Classes are held each Monday and Thursday evening from 7.30 to 9.30 o'clock.

FEE:—$1.00 PER MONTH.

If you are interested call at the school and talk the matter over with the Principal any Monday, Tuesday, or Thursday evening.

(NOTICE OF ABSENCE)

LONDON INDUSTRIAL SCHOOL

..... 191

Dear Sir (or Madam)—

I find that you were absent from the ..... While we recognize the fact that absence is sometimes unavoidable, yet regular attendance is so essential to good class work, and to the progress of the individual student, that we expect our students to make a special effort to attend regularly, and be present on time.

We are anxious that all the students now enrolled should complete the course, but in justice to those on the waiting list and to the work of the school, we cannot hold places for students who are absent from classes except for a sufficient reason.

The term certificates, upon which graduation diplomas will be based, can be granted only to those who attend 80 per cent. of the classes in the course. Kindly let me know the reason of your absence.

Yours faithfully,

H. B. BEAL, Principal.

Industrial School, Brantford—Millinery

BRANTFORD

DAY AND EVENING INDUSTRIAL SCHOOLS

Advisory Industrial Committee

Chairman: E. Sweet

MEMBERS OF THE SCHOOL BOARD

E. Sweet, Barrister.
G. Pickles, Manager of the Brantford Laundry.
Wm. Lahey, Agent of the C.P.R.
Dr. Frank, Physician.
Dr. Palmer, Physician.
R. E. Ryerson, Fruit Merchant.

APPOINTED MEMBERS

James Adams, Wagon Manufacturer.
Percy Verity, Plow Manufacturer.
E. C. Trench, Factory Superintendent.
John Kavanagh, Carpenter.
Harry Bond, Machinist.
James C. Coles, Carpenter, etc.

Staff

Principal of the Day School: A. W. Burt, B.A.

Principal of the Men's Evening Classes and Teacher of the Day Industrial Classes and of the Evening Classes in Advanced Mathematics and Practical Sheet and Plate Work: T. H. Jenkins.

English Teacher's Certificate. City and Guilds Institute, London Manual Training Certificate. Ontario Manual Training Certificate. English Art Certificate. Advanced Certificates in Mathematics, Mechanics (solids and liquids), Machine Design and Building Construction, Physics (sound, light and heat), Physiography and Physiology. Summer course in machine shop practice and forging at the Armour Institute, Chicago, U.S.A. Two summer courses in wood turning, metal work and tool and art forging at Stout Institute, Menominee, Wisconsin. Salary, $3.00 an evening.

Mechanical Drawing and Machine Design: F. Pelling.

Eight years' experience as Head Draftsman at Waterous Engine Works. Salary, $3.00 an evening.

Building Construction and Architecture: F. Bodley.

Honours, Building Construction, Winner of Competitive Examination, in Science and Technology. Five years' experience in architects' offices in Old London, including private office of Duchy of Cornwall. Two years in practice for self in South London. Six years in Canada—In Toronto; T. Hopper, Vancouver; and Taylor & Taylor, Brantford. Salary, $3.00 an evening.

Elementary Mathematics: D. H. Stewart.

B.A., Toronto. Salary, $3.00 an evening.

Building Construction: T. Harris.

Twenty years' experience in carpentry, and foreman at Schultz Bros., Contractors, Brantford. Salary, $3.00 an evening.

Supervisor of Household Science Subjects: Miss Edna Hartley.

Household Science:

Miss Edna Hartley, Ontario Certificate in Household Science and Teacher of the subject in the Day Classes at the Collegiate. Salary, $2.50 an evening.
Miss Annette Burt, Normal School Graduate. Four years' experience in Public and High Schools. Salary, $1.50 an evening.

Supervisor of the Dressmaking and Millinery Subjects: Mrs. M. A. Tulloch.

Dressmaking:

Mrs. Tulloch, 10 years' experience as practical dressmaker. $5.00 an evening.
Miss Berry, 7 years' experience as practical dressmaker. $2.00 an evening.
Miss Lake, 10 years' experience as practical dressmaker. $2.00 an evening.
Miss Bean, 5 years' experience as practical dressmaker. $2.00 an evening.
Mrs. Halligan, 5 years' experience as practical dressmaker. $2.00 an evening.

Millinery:

Miss McIntosh, engaged in the trade. $2.50 an evening.
Miss McWilliams, engaged in the trade. $2.50 an evening.

I. Report of Mr. Jenkins

DAY COURSES

The following subjects are taken in the forenoon:

9 to 10: Mechanical Drawing. 10 to 10.30: Shop Mathematics, including problems on belts, pulleys, speeds and gearings, house building, general construction, roofing, kinds, angles of the hips, rafters, jack rafters, etc. Lessons on steam engine, steam pressure, water, latent heat, gauges, thermometer, barometer, pyrometer, etc. Fly-wheel and its uses, valves, different kinds of engines, condensing and non-condensing, specific gravity, pattern making and foundry work, arithmetic, weights of castings from weights of patterns, levers, screws, axle and wheel, simple problems in mechanics, work, energy, and power. 10.30 to 12: Shop practice. The number of boys registered in this class is 19.

The following subjects are taken in the afternoons from 1.30 to 4: Science, Geography, Reading, Spelling, Literature, Arithmetic, Composition, Writing, Geometry. These are taken up by the members of the Collegiate Institute staff. At this time the Industrial teacher is taking manual training with the boys of the Collegiate Institute.

EVENING COURSES

The number registered is as follows: Elementary Mathematics, 35; Advanced Mathematics, 17; Mechanical Drawing, 28; Machine Design, 26; Building Construction, 32; Architecture, 30; Dressmaking, 247; Millinery, 52; Household Science, 58; Sheet Metal, 14—total, 539.

Hours, 8—9.30, Tuesday and Thursday nights. 8—9.30, Wednesday night, sheet metal work class only.

The course of study tentatively adopted is as follows:

Elementary Mathematics

I. (*a*) Arithmetic: Fractions, decimals, square root, and simple problems.
(*b*) Algebra: Addition, subtraction, multiplication, and division, removal of brackets, simple equations with two unknowns.

(*c*) Mensuration, square, rectangle, triangle, circle, ring, surface of cone, sphere, volume of cone and sphere.

Machine Shop Problems on levers, pulleys, belting, wheel and axle, screw cutting and the principle of screws. Fiction, work, and power. Problems on horse power.

Formulas: Bolts and nuts. Depths of threads. Speed of gears, pulleys, and grindstones, etc.

Advanced Mathematics

Arithmetic: Harder problems pertaining to the movements of machinery.

Algebra: Square root, cube root, equations with two and three unknowns.

Factors and Fractions.

Machine Shop Problems on belts, pulleys, simple and compound gearing, spur bevel, and worm gearing couplings.

Problems on keys, pins, and cotters, bearings, brackets, and stands.

Simple and advanced trigonometry where necessary to solve problems, logarithms.

Mechanical Drawing

1. *Instruments and Material*: Description and use.
2. *Materials*: How to prepare and care for them.
3. *Lettering*: Plain block type and standard letters, and figures used in practice.
4. *Practice Sheets*: Exercise in the use of pen, pencil, and compass.
5. *Geometrical Drawing*: Practical plates on same.
6. *Drawing*: Full size from black-board sketches, drawing to scale.
7. *Tracing*: The correct method and proper system to follow.
8. *Sketching*: Freehand sketches from machine parts.
9. *Detail Drawing*: From pupils' sketches of machine parts, and from black-board sketches.

Machine Design

Lettering: Plain block type and standard letters and figures used in practice.

Materials: Description of materials and metals used in machine construction under various conditions for different purposes.

Machine Design: General instructions.

Plates: On bolts, nuts, jam nuts, screws, pins, keys, etc.

Designs: For levers, cranks, bell cranks, pulleys, shaft couplings, bearings of various types, iron and paper, frictions spur bevel and mitre gears, hangers, shafting, belting, drives and speed of same.

Sketches: Original sketches by pupil from description given by instructor.

Assembly Work: Details; parts of machine; assembly.

Specifications for shop use.

Building Construction

Introduction: Need and use of drawings, necessity of ability to read plans intelligently.

Foundations: Suitable and unsuitable soils, methods of overcoming latter. Concrete footings and foundations, walls (various types).

Stone Work: Kinds of stone used in building, tools, cutting bonds and uses for which suitable.

Industrial School, Brantford—Dressmaking

Brick work: Brick manufacture, bonds, arches, groins, domes, etc. If possible this will include such things as retaining walls, etc.

Carpenter Work: Lumber and nature of, used in building construction, its defects and strengths. Framing, heavy and light. Roofs, and roof trusses, joints in carpentry, shoring, etc.

Joinery: Trim, finishes, stairs, doors, windows and work connected therewith.

Plaster work: Materials, mixture, finish.

Painting: Treatment of finish for wood, iron, stone, etc.

Plumbing: Systems used in modern residences.

General: Methods of heating and ventilating, materials, types of structural steel and iron work, drainage.

Architecture

1. Study of the orders.
   Proportion and design. Lecture on ancient examples.
   Class and Home Work: Design of (*a*) cottage, (*b*) small residence, (*c*) small church.
2. *Study of acoustics, ventilation, heating, etc.*

Science

Mechanics: Mass and force, stress and strain, elasticity, parallel forces. Centre of gravity of rods, beams, and lamina, levers, pulleys, and screws.

Dynamics: Friction:

(*a*) General Laws of Friction.

(*b*) Limited friction in different parts of machinery.

Hydraulics: 1. Motion of liquids in pipes flowing full under pressure, losses of head, water supply to a house, group of houses. (2) Pipes flowing partially full. (3) Simple system of drains and jets.

Practical Sheet and Plate Metal Work

Elbows, hoods, trunks, boxes, fenders, articles formed by cones cut obliquely, elliptical work, roofing work, ship ventilators, worked up pipe bends, breaches, pieces, etc., vases, brackets, dustpans, etc.

Patterns for irregular articles.

Sheet metal joints.

Surface treatment of metals.

Metals and their properties.

Mensuration rules.

Sheet and plate working machines and tools.

Accommodations

The present accommodation is very unsatisfactory for both Day and Evening Classes. This defect can be remedied only by the erection of a new Technical School. The need of a separate building has been clearly demonstrated by the large attendance and the enthusiasm shown by the students in their work in the classes.

Equipment

Woodworking: 20 Benches with all necessary tools, 4 wood-turning lathes and 3 h.p. motor, 1 band saw with 1 h.p. motor, value $1,481.38.

Metal Working: 8 Forges with 5 h.p. motor, 8 anvils with tools, 6 bench vises, dry tool grinder, 1 engine lathe, value $1,357.28.

Drafting Room: 40 Drawing tables, drawing boards, T squares, set squares, and a set of instruments for each boy, value $292.52.

There is also ample equipment for Household Science.

General Remarks

Last August I made a canvass of all the factories, where I was received with the utmost courtesy by the manufacturers, superintendents, and men. In fact, most of the foremen tried to convince the men of the importance of Industrial education, and urged them to take advantage of the classes.

But the best way in which the manufacturer can show his sympathy with this branch of education is by adopting the Eight Hours' Labour Bill, and arranging a part-time system whereby lads under eighteen may attend Day classes. We cannot expect young men who have been in the factory from 7 a.m. to 6 p.m. to turn out on a cold night to attend classes which require so much concentration of mind.

The Advisory Committee should be composed mostly of manufacturers, as the success of these classes depends largely on the preference given to students attending the classes.

I intend at the end of the session to hold an examination in the several subjects taught in the Evening Classes, and to recommend the Board to issue certificates to the successful candidates. But for the examination, the standard must be high, so that the foreman and holder of the certificate will appreciate it.

Last year I tried the following scheme toward solving the important problem of Industrial education: I visited the Senior Fourth Form in one of the public schools of the city, and after a short address on Technical education fifteen boys joined the Industrial Class at the Collegiate Institute. Upon investigation I found the average age of these boys to be higher than that either of those who had failed at the High School Entrance Examination, or of those who had been successful. To ensure the success of this Industrial Class, we must, therefore, draw our pupils from:

(1) Those in the Senior Fourth who do not intend trying the Entrance Examination; or from—

(2) Those who may have failed to pass it and are fit for the Industrial Classes.

If I had visited other schools the Industrial Classes would probably have been too large for our limited accommodations. To work out this scheme satisfactorily there should be another teacher who is capable and enthusiastic in the correlative subjects of the afternoon work. This appears to be the only solution of the problem of how to extend the school life of this class of boys without raising the age limit.

High and Technical Schools, Sault Ste. Marie

SAULT STE. MARIE

DAY PART-TIME CO-OPERATIVE AND TECHNICAL CLASSES, AND EVENING INDUSTRIAL CLASSES

Advisory Industrial Committee

Chairman: John Hussey.

MEMBERS OF THE SCHOOL BOARD

John Hussey, Wholesale Meat Merchant.
Henry Derrer, Superintendent Algoma Iron Works.
A. A. Shepard, M.D.
C. E. Sullivan, Merchant.
J. A. Shannon, D.D.S.
J. W. Hunt, M.D.

APPOINTED MEMBERS

J. H. Haining, Contractor.
W. J. Hesson, Lumber Merchant.
A. Mitchell, Superintendent Algoma Steel Company.
Angus McGregor, Bricklayer.
Archie Hugill, Blast Furnaces.
James Lycitt, Foreman at Blast Furnaces.

Staff

Principal: W. B. Race, B.A.
Specialist in Moderns and History, Principal of the Collegiate Institute.
Mathematics: George W. Rudlen.
Specialist in Mathematics, High School Staff.
Science: Daniel I. Walkom, M.A.
Teacher of Science, High School Staff.
Industrial Subjects: Thomas J. Later.
Manual Training Certificate, several years' experience in the car shops at Chicago.
Each teacher is paid at the rate of $3.00 an evening.

ACCOMMODATIONS AND EQUIPMENT

The accommodations for carrying on the work outlined above are very complete, especially in the provision made for Mechanical Drawing. The total value of the equipment for each department is as follows:—

Woodworking	$324.82
Wood Turning	269.67
Machine Shop	2,824.97
Forge Room	212.16
Mechanical Drawing	458.80
Total	$4,090.42

High and Technical Schools, Sault Ste. Marie—Mechanical Drawing

Principal's Report

COURSES OF STUDY

Evening classes were held from October 1st, 1911, to April 1st, 1912, three times a week from 7.30 to 10 o'clock. Twenty young men, the majority of whom were employees of the steel plant, attended these classes, and applied themselves diligently to the study of Mechanical Drawing, Mathematics, and Science. The teachers were the Mathematical, Science, and Manual training teachers of the High School. These classes are not running this year, and I have had some difficulty in finding out why there has not been as much interest as last year. It seems that many of the young men have been transferred from the day shift to the night shift and back again in such a way as to interfere with their regular attendance at night classes, and a night school has been opened in the vicinity of the steel plant by an enterprising business college, which saves them a long walk after their day's work.

CO-OPERATIVE PART-TIME COURSES

In arranging a time-table for the night classes, I find that it is not wise to be arbitrary in the selection of the subjects and in the apportionment of the time. Young men who have worked hard all day attend school at night with a fairly definite idea of what they want, and the Principal should lay out a course to suit their needs. Nearly all our pupils expressed a desire to get as much instruction as possible in the Draughting-room, and usually an hour and a half was spent each evening at Mechanical Drawing and Shop Mathematics. Improvement in this work attracted attention more readily in the shops, and the approbation of their foreman and superintendent is what the boys strive to obtain. One half hour was spent in Elementary Physics and Chemistry, and another half hour in English Literature, English Grammar, or History. The boys preferred at first to do without the latter subjects, but after reading one of Shakespeare's historical plays and one of Scott's narrative poems, it was quite evident that a taste for good reading was being awakened and it was pleasant to observe what a keen interest the boys took in the events of history hitherto unknown to them and in the beauties of literature hitherto unsuspected.

During the last two years a class of twelve young men from the Algoma Iron Works has been sent by the Superintendent of that Institution to spend every Friday afternoon from 1.30 to 6 in the Technical Department of the High School. As this privilege has been given without any deduction in their wages, the apprentices appreciate very much the opportunity afforded them to improve their education, and they apply themselves diligently to their lessons in the school, and at the same time show a greater interest in their work at the shops. The work done by these apprentices in the school consists of Mechanical Drawing, Elementary Design, and Shop Problems in Mathematics. They are taught to draw the parts of the machines with which they have to work; this includes also the drafting of the individual parts of a train of gears. From these, tracings and blue prints are made. Manufacturers look upon this training as particularly valuable, for the boys must study the minutest details in making the drawings, and they have to work from the blue prints in the shops. This training is, therefore, of great assistance to them in the reading of the prints correctly and intelligently.

So interested is the Superintendent of the Iron Works in this branch of the work that he occasionally visits the school to see what progress the boys are making, and to judge personally of the quality of the work done. He reports that the training received in the studying of plans is a great saving of time in the shops,

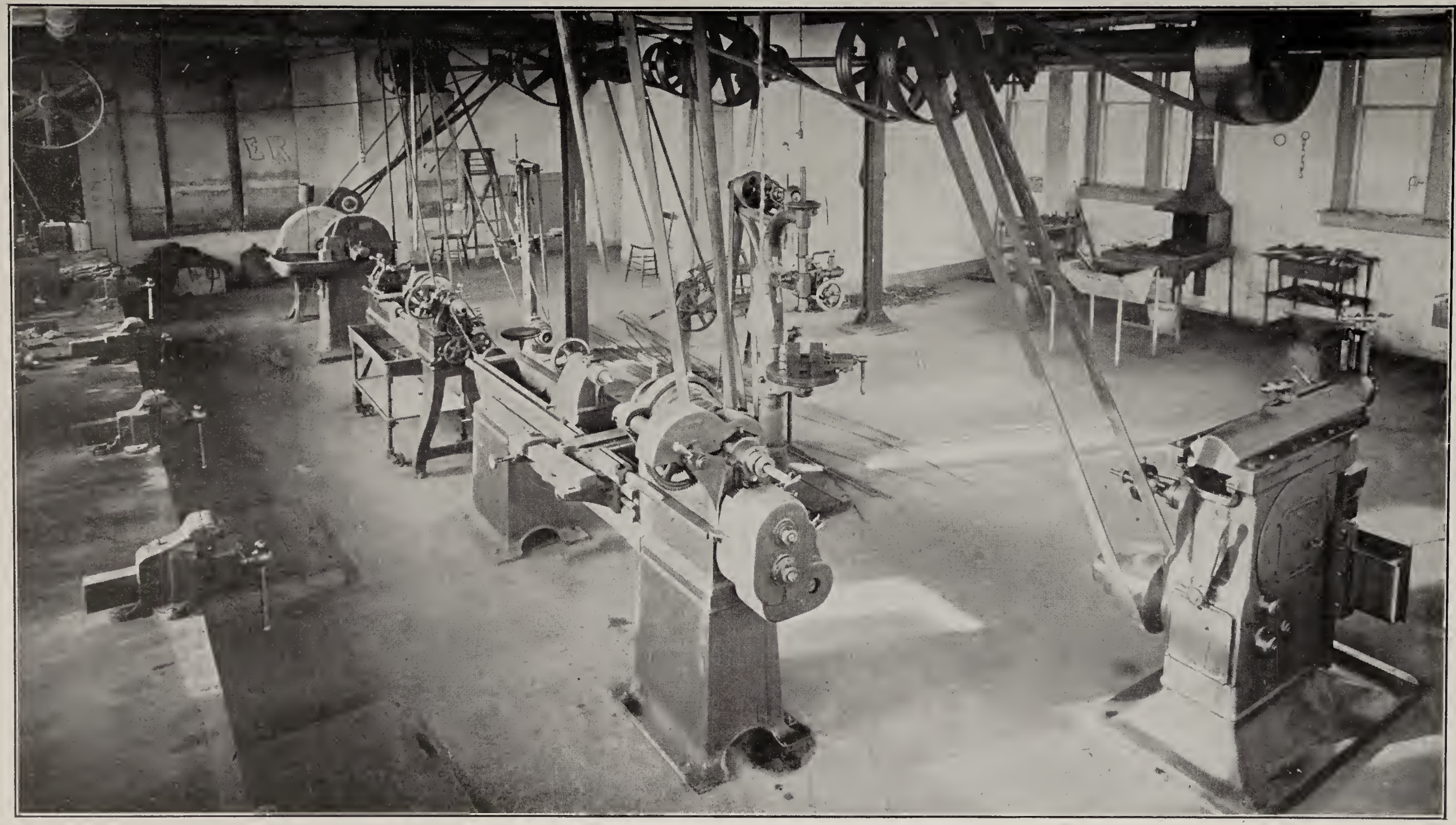
owing to the difficulty in finding time to give the necessary instruction there, and in finding instructors who have the proper teaching qualifications to impart the underlying principles in a clear and comprehensive manner. In addition to the above-mentioned subjects, about an hour is devoted each day the class meets to the study of English, the amount and the nature of which is left to the discretion of the teacher. The Superintendent has stated that he would make a proper allowance for the work done in the school in the way of shortening their apprenticeship; but so far the value of the training has shown itself in the increased efficiency of the apprentice in the shop, and in the awakening and developing of a desire for self-improvement, not only along the line of their regular work, but in a taste for reading and an interest in those things in life which tend to make them better citizens. To stimulate in this way the ambitions of boys who have been denied the advantages of an education is worth all the work and the expense involved, and the value to society of an awakened intelligence cannot be estimated in dollars and cents.

GENERAL REMARKS

I regret that I cannot report a greater attendance at the Industrial classes at present. The heads of the departments of the Lake Superior Corporation have been changed very frequently, and the difficulty in obtaining suitable labour has been so great that many of them cannot be persuaded to spare from the shops boys whose work is so necessary to make the operations of the particular department pay. Some are unsympathetic, and others, while approving of the idea of Industrial classes, cannot be persuaded to allow their apprentices to leave work undone in the shops to go to school. And it is impossible in a city of this size to obtain a class to take a year or two in the school, spending part of the time in the machine shop and woodworking-room, and the rest of the time in the drafting-room. The demand for boys in the machine shops of the Company with good pay from the start is irresistible.

All the pupils in attendance at the High School, with a few exceptions, take with much interest the work in the Technical Department. This work does not properly come under the head of Industrial Education, but in the main it is of a technical character, as it prepares for directive positions and for entrance into the higher technical schools. Nearly every boy who passes through the High School takes a thorough course in Mechanical Drawing, continuing it voluntarily in the Third Form, doing the work in addition to the regular work prescribed for Matriculation and Entrance to the Normal Schools. They also spend some time in the Manual Training room, and feel that the time is well spent. There are usually several study periods a week in each Form of the High School, and by bringing these together on one day it is a very easy matter to spare the time without feeling the loss in the other studies of the school. The students who are preparing for a course in the School of Science take a special interest in this class, as some of them hope later to take positions in the engineering departments of the Lake Superior Corporation.

As the steel industry is the only one in the city from which we may hope for pupils for our Industrial classes, it is evident that there will not be the same variety as in other towns in the subjects taught.



High and Technical Schools, Sault Ste. Marie—Metal Working

HAILEYBURY

DAY AND EVENING INDUSTRIAL AND TECHNICAL MINING SCHOOLS

Advisory Industrial Committee

Chairman: George T. Smith

MEMBERS OF THE SCHOOL BOARD

George T. Smith, Mining Recorder.
J. McNairn Hall, Barrister.
George T. Hamilton, Postmaster.
J. E. McCuiag, Insurance Agent.
F. C. Preston, Merchant.
J. T. McMahoun, Mine Owner.

APPOINTED MEMBERS

I. H. James, Manager of O'Brien Mine, Chairman of Sub-Committee of Appointed Members.
C. A. Foster, Mining Engineer and Mine Owner.
Arthur Ferland, Director of Nippissing Mine.
R. T. Shillington, M.P.P., Director of Cobalt Central.
Major King, Manager of Coniagas Mine.
J. H. Black, Manager of Northern Ontario Light and Power Co.

Staff

Principal and Teacher of Mathematics and Science: W. Ashbury Wilson, B.A., Principal of High School.

Mining Instructor: Chas. Spearman, B.Sc., A.M. Pure science with mining and geology at Columbia, U.S.; mining engineering at Queen's, Kingston.

Principal's Report

ACCOMMODATIONS AND EQUIPMENT

The practical mining laboratory occupies a room 14 ft. by 32 ft. It has stone walls and a concrete floor. In this room is installed an assay plant costing $274.09 and a mineralogical cabinet, with 900 specimens, costing $70.00. The reference library, now valued at $36.00, in addition to the regular Dominion and Provincial Reports, consists of the most up-to-date books; they deal with economic geology, mineralogy, palaeontology, petrology, and mining methods.

This department was organized and a mining instructor appointed on the 15th of October, 1912. Consequently much of the time has been spent in organization, and in obtaining and installing the necessary equipment.

The mining instructor has also charge of the regular high school classes in physical geography and chemistry. All pupils who have spent one year in the High School are permitted to take up mineralogy and geology. Regular class periods are allotted on the time-table for this work. Frequent excursions have been made for

the field study of geology and mineralogy. The Haileybury High School is particularly fortunate in the matter of location, being in the Cobalt area and adjacent to Lorrain, Gowganda, Swastika, and Porcupine, where all the different processes of metallurgy and practical mining may be observed.

Evening classes in Mineralogy and Drafting are being held for those who are otherwise employed during the day. These, together with lectures, will constitute much of the work during the present term.

COURSES OF STUDY

The Courses as submitted by the Advisory Committee for the guidance of the mining teacher are:

I. PREPARATORY.

Physical Geography, Geology, Chemistry, (elementary and practical) Physics, and Mineralogy.

II. PRACTICAL.

(*a*) *Prospecting*: Government Reports, Outfit, Staking and Recording, Outcrops, Vein Formation, Mineral Deposits, Working a Claim, Development, Diamond Drilling.

(*b*) *Mining*: Surface arrangements, Shafts, Drifts, Slopes, Timbering, Drilling, Blasting, Scaling, Hauling, Hoisting, Drainage, Pumping, Ventilation, Signalling, Trackwork, Sanitary Arrangements, Prevention of Accidents.

(*c*) *Smelting and Refining*: Sampling, Melting, and Refining.

(*d*) *Milling*: Crushing, Jigging, Stamping, Concentrating, Cyaniding, and Amalgamating.

(*e*) *Mechanics*: Steam; Boilers and Engines, Heating, Pumps, Compressed Air; Compressors, Air Drills, Hoists and other Appliances. Electricity; Dynamos and Motors. Lighting. Power Development, Transmission, Distribution. Textbooks and References; Engineers' Handbooks, Use of Tables, etc.

III. ADVANCED.

(*a*) *Mathematics*: Algebra, Geometry, and Trigonometry.

(*b*) *Surveying and Draughting*: Chain and Transit Surveying, Mine Surveying, Geometrical Drawing, Mapping and Lettering, Blue Prints.

(*c*) *Engineering Chemistry*: Explosives, Gases, Fuels.

(*d*) *Metallurgy*: Assaying and Blowpiping.

(*e*) *Business and Administration*: Mine Accounting, Company Law, Banking, Cost, Accounting.

(*f*) *Marketing*: Silver Markets, Silver Consumption, Minting.

(*g*) *Miscellaneous*: Examining Properties, Ore Reserves, Valuing Properties.

SUDBURY

DAY INDUSTRIAL AND TECHNICAL MINING SCHOOL

Advisory Industrial Board

Chairman: Dr. R. H. Arthur

MEMBERS OF THE SCHOOL BOARD

Dr. R. H. Arthur, Physician.
D. Baikie, Merchant.
D. M. Brodie, Police Magistrate.
S. Fournier, Registrar.
C. McCrae, M.P.P., Lawyer.
P. S. Frawley, Merchant.

APPOINTED MEMBERS

D. H. Browne, Metallurgist, Canada Copper Co.
C. V. Corless, B.Sc. Manager Mond Nickel Co.
J. N. Glidden, Manager Dominion Nickel Copper Co.
F. A. Jordan, B.S., Manager Moose Mountain Limited.
A. L. Sharpe, B.Sc., Manager Garson Mine.
W. W. Stull, B.Sc., Surveyor.

Staff

Principal: H. S. Berlanquet.

Mechanical Drawing, Mineralogy, Fire Assaying, Chemical Analysis, Surveying.
H. T. White, M.A., B.Sc.
Science: J. L. O'Grady. High School Staff.
Mathematics: R. W. Baher, B.A. High School Staff.

Principal's Report

COURSES OF STUDY

The Mining course was organized in 1910, under the control of the High School Board. As soon as the regulations governing Technical Education were drafted, an Advisory Industrial Committee was appointed. The course of study has been planned primarily, to fit students of the High School, who have no intention of going to the University, for positions in the mines adjacent to the town. Provision has also been made for men who have sufficient previous knowledge to do so, to take short courses during the winter in Mineralogy, Chemistry, and Fire Assaying.

The course for High School pupils is as follows:

First and Second Years:

1. The General Course of the Lower School.
2. Mechanical Drawing.
3. Mineralogy.
4. Practical Physics and Chemistry.

5. Workshop Mathematics.

THIRD AND FOURTH YEARS:

Mechanical Drawing; Mathematics; Physics; Mineralogy; Chemical Analysis; Fire Assaying; Surveying.

Students are required to visit the mines and smelting plants of the district, during the term; and they must also spend their summer vacations in the mine or in the field.

ATTENDANCE

There are 26 boys in the first two years, 5 in the third year, and 1 in the fourth year.

EQUIPMENT AND VALUE

In Science the equipment is all that could be desired. For Drawing, a separate room has been equipped with drawing tables. The students supply their own instruments, etc. For Fire Assaying, a separate building has been erected, equipped with furnace and all necessary appliances.

In addition, one hand drill, and one power drill have been loaned by the Canadian-Cleveland Drill Co., and by the Canadian Rand Co., respectively.

The value of the equipment is approximately:

Science	$1,500
Assaying	100
Drawing	50
Library—Scientific and Mining	120

GENERAL REMARKS

The public have been very much interested in the success of the undertaking. Especially is this true of the men of the district who are prominent in the mining industry. The Industrial Committee, composed at it is largely of these men, has been very active in its support. The Mond Nickel Co., through its manager, Mr. C. V. Corless, has given two scholarships of the value of $100 each to be competed for at the end of the third year. Some of the other companies have also signified their willingness to give scholarships which will take the form of special positions in the mines during the summer.

Collegiate Institute and Industrial School, Berlin

BERLIN

EVENING INDUSTRIAL SCHOOL

Advisory Industrial Committee

Chairman: Edward Smyth

MEMBERS OF THE SCHOOL BOARD

Edward Smyth, Merchant.
A. L. Breithaupt, Manufacturer.
J. A. Lang, Manufacturer.
A. L. Bitzer, Lawyer.
Dr. H. H. Huehnergard, Physician.
D. A. Bean, Newspaper Editor.

APPOINTED MEMBERS

H. Braniff, Machine Builder and Contractor.
Jno. Cochrane, Manager Jackson and Cochrane Foundry.
W. T. Sass, Manager Berlin Interior Hardwood Co.
J. W. Hess, Engineering Superintendent, Williams, Greene & Rome Co., Mfrs. Shirts, Collars and Cuffs.
A. H. Welker, Foreman Pollock Manufacturing Co.
R. S. Porteous, Foreman, Anthes Furniture Co.

Staff

Principal: D. Forsyth, B.A.

Freehand, Mechanical, and Architectural Drawing: D. W. Houston.

Is Manual Training Instructor in the Collegiate. Has had eighteen years' experience in Public School work; nine years as Manual Training Instructor of day classes and two sessions as Instructor in the evening classes. Holds First Class Public School Certificate, High School Assistant's Certificate and Manual Training Specialist Certificate (1906). Salary, $3.00 an evening of two hours.

English and Mathematics: H. W. Brown.

B.A., of Queen's. Holds First Class Public School Certificate (1902); High School Assistant's Certificate (1908); High School Principal's Certificate (1912). Has had seventeen years' Public School experience and seven years' High School experience. At present Art and Junior Mathematical Master in the Collegiate. Salary, $3.00 an evening of two hours.

Household Science: Miss E. Ferguson.

Holds Household Science Certificate, dated 1905. Has had seven and one-half years of this work. Taught Evening Classes of the past two or three years. Is at present Household Science Instructor in the Collegiate. Salary, $3.00 an evening of two hours.

Dressmaking: Miss E. Krueger.

Is an experienced and practical forewoman in one of the local factories and, though she has had no pedagogical training, her work in last year's classes was excellent, particularly so on the practical side. Salary, $3.00 an evening of two hours.

Principal's Report

EVENING SCHOOL

No attempt has yet been made to establish day classes. Lack of proper quarters seems to be the chief difficulty.

Evening classes are held twice weekly, on Mondays and Thursdays from 7.30 to 9.30, from October to May.

For Men: A.—Course for Machinists; B.—Course for Builders;

For Women: C.—Course in Household Science: D.—Course in Dressmaking.

A three years' course is offered in each class, and, at the close of each year's work, an examination will be held in the various subjects, and only those who show reasonable progress will be promoted.

DIPLOMAS

Students who complete a three years' course in any one class will receive a diploma from the Board of Education.

DEPOSIT AND REFUND

A yearly deposit of $2.00 must be made by each student on entering a class, merely to show that he is in earnest.

At the end of the School term, in May, this deposit will be returned to the student on the basis of attendance as follows:

One half if the attendance reaches 50 per cent.;

Three fourths if the attendance reaches 75 per cent.;

The whole if the attendance reaches 90 per cent.

If a student is absent for a good reason such as sickness, bereavement, overtime work, etc., the teacher may count the student as present, if the excuse be given to the teacher immediately after each absence.

COURSES OF STUDY

Course A—For Machinists

This course is not intended to produce mechanical draftsmen. It aims to teach machinists the principles of freehand and projection drawing, and to enable them: to make rapid intelligible sketches, and to read a blue print quickly and accurately. Neatness, accuracy and speed will be emphasized.

First Year:—Business English, Practical Mathematics, Elementary Freehand Drawing, Elementary Mechanical Drawing.

Second Year:—Business English, Practical Mathematics, Mechanical and Machine Drawing.

Third Year:—Practical Mathematics, Machine Drawing and Machine Design.

Course B—For Builders

This course is not intended to produce Architectural draftsmen. It is designed to meet the needs of Carpenters, Cabinet Makers, Bricklayers, Stonemasons, Sheet Metal Workers, etc., so as to make them more skilful and efficient, and to enable them to interpret a blue print quickly and accurately. As in Course A, neatness, speed, and accuracy will be emphasized.

First Year:—Business English, Practical Mathematics, Elementary Freehand Drawing, Elementary Mechanical Drawing.

Second Year:—Business English, Practical Mathematics, Architectural Drawing and Design.

Third Year:—Practical Mathematics, Building Construction, Drawing, and Estimating.

Course C—Household Science

This course is intended to assist young women to become home makers.

First Year:—Cookery.

Second Year:—Cookery, Sanitation, and Care of the House.

Third Year:—Cookery, Laundering.

Course D—Dressmaking

The course in dressmaking aims to teach girls and women how to make their own garments in a workmanlike and stylish manner. A graduated three years' course is provided under a thorough and competent dressmaker.

First Year:—Stitching, Machine Sewing, etc.

Second Year:—Making Undergarments and Shirtwaists.

Third Year:—Making Skirts, Suits, and Single Dresses.

Details of Courses

Business English

This subject is included in Courses A and B to give students the ability to express themselves clearly and intelligently, and to transact their personal business affairs in a proper manner. The work is taken up in a practical way, and, as far as possible, the individual need of each student is met. No attempt is made to prepare students for office positions.

A synopsis of the work is as follows:—Correction of common mistakes in spelling, pronunciation, and the use of words; proper way to make out drafts, money orders, cheques, bills, invoices, receipts, etc.; how to write an advertisement, or a letter applying for a position; how to write and answer invitations; how to write business and personal letters, and telegrams; how to write items and reports for the public press; how to keep the minutes of a meeting; proper form of a resolution; writing of a brief report of some piece of practical work or description of an invention, etc.

Practical Mathematics

This subject is included in Courses A. and B., since progress in any branch of Industrial Education is impossible without a good working knowledge of mathematics, the foundation of which is the study of Arithmetic. The work will be arranged along practical lines and properly graded.

Arithmetic and Mensuration will include the simple rules; vulgar and decimal fractions; ratio and proportion; percentage; measurement of areas and volumes; practical problems; approximate and check methods.

Geometry, Algebra, and Trigonometry will include only such parts as are found useful in practical life. Attention will be given to the handling of workshop formulas; the nature and use of logarithms; the properties of angles and triangles; the solution of triangles and the measurement of irregular areas; the uses of the slide rule to facilitate rapid calculations; graphical use of squared paper.

Freehand Drawing

This is an Elementary One Year's Course and will include: (*a*) Direct sketching with pencil mainly of objects related to the every day work of the students.

(*b*) Objects in perspective involving simple fore-shortened faces and the fore-shortening of circular, rectangular, and irregular surfaces in any position. Subjects

to consist of familiar objects, tools, simple parts of machines, mechanical appliances, frames, doors, etc., to develop practically the elementary principles of perspective.

(*c*) Quick sketches to give practice in judging proportions and sketching from memory; the teacher's criticisms and suggestions to be given effect to in revised or entirely redrawn sketches.

(*d*) Simple lettering and its application to workshop drawings.

Mechanical Drawing

This is an Elementary One Year's Course and will include: Explanation of the various drafting instruments and their uses; kinds of lines used in working drawings; exercise plates to give the student experience in laying off accurately by scale, and in using the compass for making circles; illustrations of geometrical definitions; the twelve most important problems; practical applications of these problems in working drawings; introduction of principles of third angle projection by making working drawings of real objects such as are met with in every day work of the mechanics; simple lettering, capitals and script; freehand and dimensioned sketches and production of working drawings from same; scale drawing; perspective drawings developed from plans; tracings; blue prints; isometric projections.

NOTE.—Work in Machine Drawing and Design, Advanced Mechanical Drawing, Architectural Drawing and Design, Building Construction Drawing and Estimating, will be outlined before the end of the present school year.

Household Science

FIRST YEAR:—Practical Cookery.

SECOND YEAR:—

1st Quarter:—Practical Cookery.

2nd Quarter:—Lectures on Sanitation.

3rd Quarter:—Practical Cookery.

4th Quarter:—Lectures on the Care of the House.

THIRD YEAR:—

1st Half:—Practical Cookery.

2nd Half:—Practical Laundering.

Dressmaking

FIRST YEAR:—(1) Making samples of stitch forms including basting, running, gathering, stitching, back-stitching, two-runs-and-a backstitch, overcasting, overhanding, hemming, hemstitching, blanket-stitching, button-hole-stitching, catch-stitching.

(2) Cloth cutting (straight, bias, true bias); hems (wide, narrow, napery); seams (plain, fell, French, overhanded); placquets (for sleeve and skirt); joining bias pieces; matching patterns (straight and bias); putting on bands; stroking gathers; sewing on buttons, tapes, hooks, eyes; making button-holes; patching (hemmed, overhanded, flannel); darning and mending.

(3) Making bags, aprons, hairholders, kimonas, handkerchiefs, etc.

(4) Running and care of Sewing-machines and attachments.

SECOND YEAR:—(1) Instruction in the use of patterns.

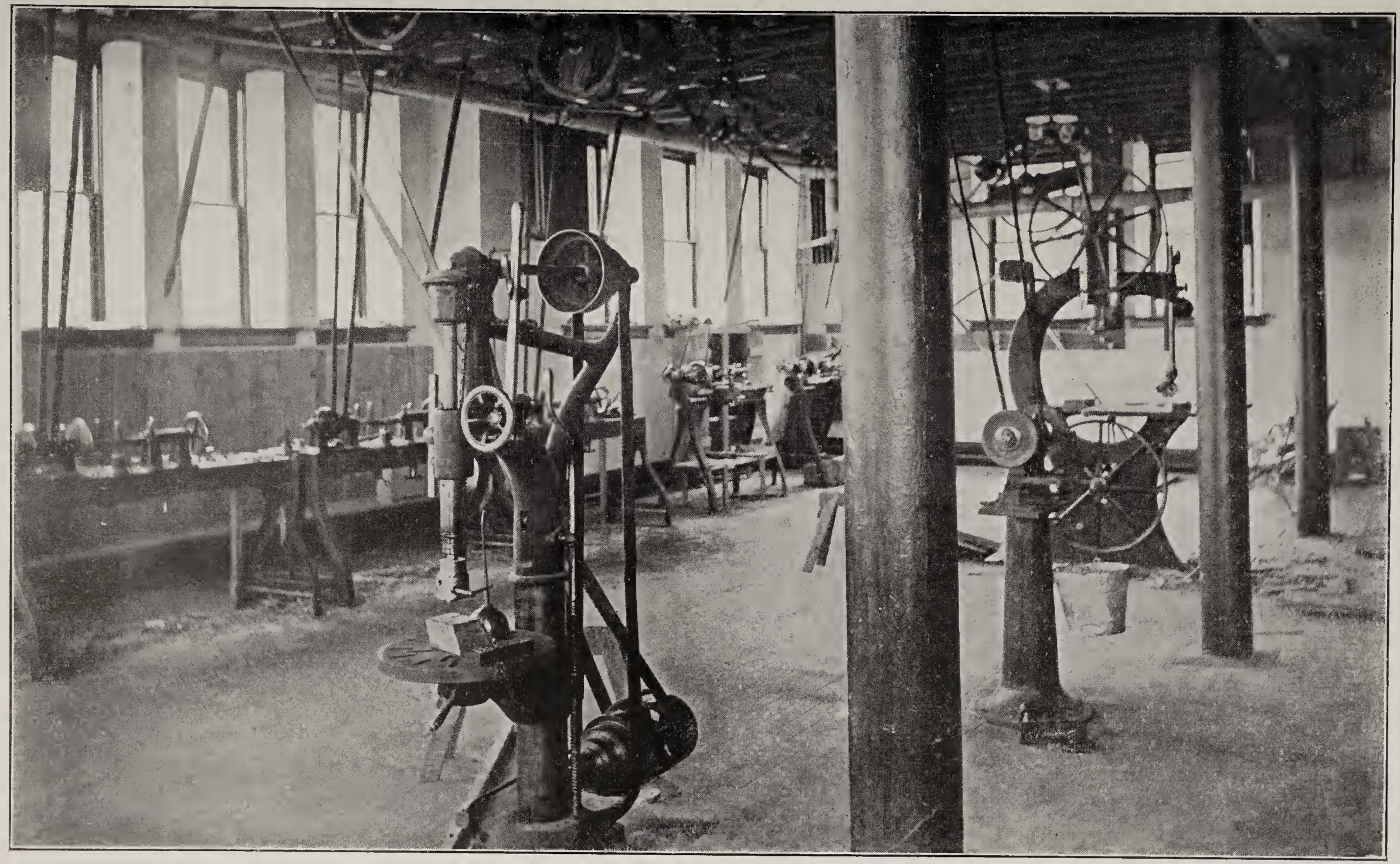
(2) Cutting and making undergarments.

(3) Sewing on laces, etc.

(4) Making plain shirtwaists.

NOTE 1.—All material must be provided by the pupil.

NOTE 2.—This course is open only to those students who have taken the first year course, or who are able to do the full equivalent of work taught in that course.



Collegiate Institute and Industrial School, Berlin—Metal Working

THIRD YEAR:—(1) Cutting and making plain skirts.
(2) Practice in fitting.
(3) Making shirtwaist suits.
(4) Making simple dresses.

NOTE 1.—All material must be provided by the pupil.
NOTE 2.—This course is open only to those pupils who have taken the first and second year courses, or who are able to do the full equivalent of work taught in these courses.

ATTENDANCE

Last season's figures are given, as classes have not yet been fully organized for 1912-13. Total, 93; Drawing, 30; Practical Mathematics, 24; Household Science, 24; Sewing, 31. Total number of lessons, 28. Length of session, January 2nd to April 23rd.

ACCOMMODATIONS

(1) For Business English and Practical Mathematics one of the Collegiate Class-rooms is used.

(2) For the Drawing Classes the benches in the Manual Training Department are used.

(3) For Household Science that Department of the Collegiate is used.

(4) For Dressmaking a portion of the Manual Training room was partitioned off last year, and a motor, four power sewing-machines, one domestic sewing-machine and suitable tables were installed. For a small class the room answers fairly well, but it is looked upon as a temporary arrangement only.

VALUE OF EQUIPMENT

Manual Training Department:

Equipment—Wood and Iron: Approximate valuation, $2,350.00. This equipment is not yet used for evening class purposes.

Household Science Department:

Equipment: Kitchen, $685.00; Storeroom, $110.00; Dining-room, $105.00; Library, $40.00; Locker-room, $120.00; Linen, Cutlery, and Dishes, $425.00; Total, $1,485.00.

Dressmaking Department:

Equipment: Tables, lighting, motor, 4 power machines, 1 domestic machine, etc., $450.00.

GENERAL REMARKS

The erection of a more up-to-date and more commodious Collegiate building is being discussed, but local difficulties will probably prevent immediate action.

So far as manifested the attitude of the public is decidedly favourable. The local mnaufacturers are clamouring for expert help and, probably for this reason, they are, as a matter of fact, keener for the establishment of Industrial Evening Classes than are many of the men themselves. The manufacturers assist by distributing literature and notices in their factories, and by encouraging the men to attend the evening classes. So far no general expression has been obtained relative to arranging continuation work for apprentices in part of the manufacturer's time but several manufacturers have said that they consider the plan an excellent one and would give it every support.

The six members of the Advisory Committee appointed as representatives of the employers and employees are enthusiastic and very helpful.

BROCKVILLE

EVENING INDUSTRIAL SCHOOL

Advisory Industrial Committee

Chairman, J. Greene

MEMBERS OF THE SCHOOL BOARD

J. Greene, Bookseller.
O. K. Fraser, Lawyer and Surrogate Registrar.
W. H. Kyle, Manufacturer of Confectionery, etc.
S. J. Geash, Assistant Manager of the Brockville Lumber Company.
W. A. Gilmour, Collector of Customs.
C. J. Shirreff, President of Shirreff Manufacturing Company.

APPOINTED MEMBERS

T. J. Storey, President of Canada Carriage Company.
J. H. A. Briggs, President of the James Smart Manufacturing Company.
H. W. Going, President of the St. Lawrence Engine Company.
W. F. Phippen, Foreman in Canada Carriage Company.
J. Gibbins, Foreman in Brockville Lumber Company.
J. Osmond, Foreman in James Smart Manufacturing Company.

Staff

Principal and Teacher of English: A. J. Husband, B.A.
Specialist in Moderns and History in the Collegiate Institute.

Mathematics: J. W. Forbes, B.A.
Specialist in Mathematics and teacher of Mathematics in the Collegiate Institute.

Electricity and Chemistry: J. F. McGuire, M.A.
Specialist in Science, and teacher of Science in the Collegiate Institute.

Mechanical Drawing: J. McCrea.
Draftsman at the St. Lawrence Engine Works.

Woodworking: J. Timleck.
Pattern Worker and Wood Carver, with the James Smart Manufacturing Company.

Freehand Drawing: R. H. Lindsay.
Designer and Artist. Primary and advanced certificates from the Department of Education. Special certificate for work exhibited at the Columbian Exposition. Conducted the Art School for eight years under the former system.

Cookery: Mrs. Davey.
Practical cook. Trained in the evening industrial classes of England. For years she has done all the local catering.

Miss Kendall: The teacher of Domestic Science in the Brockville Public Schools. Certificate from the Department of Education.

Dressmaking: Mrs. Wright.
An expert dressmaker. Has worked at this trade for years.

Each teacher receives $3.00 an evening for a lesson of two hours, and $2.00 for a lesson of one hour.

Principal's Report

In conducting the classes, discipline seems hardly to be an appreciable factor, as all seem anxious to co-operate with us in keeping every thing around the Institute in the best possible order for work on the following day.

In organizing I considered particularly the following three points:

1. The fact that the majority wished to take two subjects.
2. The present attainments of those enrolled, for as I enrolled them I tried to gather as accurately as possible their standing in the subjects they wished to take.

3. The need for small classes, owing to the many differences in standing that still existed, after what seemed the best classification had been made.

Owing to the heavy enrolment, each division of the class in every subject except English is held only once a week; but, when pupils take only one subject, they are permitted to attend both divisions of the class. The class in English is held twice a week. By alternating the various classes and groups almost all are able to get two classes a week. The lessons in Cookery, Woodworking, Mechanical Drawing, Dressmaking, and Freehand Drawing are two hours in length, while the lessons in Mathematics, Chemistry, Electricity, and English last but one hour.

The classes are well attended and the interest in them is growing.

The Woodworking and Household Science Classes are accommodated in the building set aside by the Public School Board for those subjects.

All other classes are conducted at the Collegiate Institute and suitable modifications have been made in lighting, etc., to permit of their being conducted in a very efficient way. We are hoping, however, that in the near future we shall have a building hard by the Collegiate Institute in which provision will be made for Domestic Science, Woodworking, Metal Working, Dressmaking, Drafting, etc.

ATTENDANCE

The subjects taught with the numbers taking them are as follows:

Mechanical Drawing	40
Woodworking	26
Electricity	47
Chemistry	12
Mathematics	55
English	40
Freehand Drawing	48
Dressmaking	88
Cookery	60

GENERAL REMARKS

On the receipt of the request of the Education Department that Industrial Classes be formed, the Collegiate Institute Board appointed a Committee to meet the manufacturers and inquire into the need for industrial education in Brockville. This committee brought in a report in which they strongly advocated the establishing of such classes, assuring the Board that there was the demand for them, and that they would also have the hearty co-operation of all employers.

In accordance with this report the Industrial Committee was at once formed. After selecting the subjects that were to be taught, we decided to set apart the evenings of the week beginning October 21st for enrolment. I prepared a folder giving necessary information in regard to subjects, time of enrolment, etc., and we distributed these in the factories, shops, and stores. Each evening of the week referred to I was in the Committee Room of our City Hall for the purpose of enrolling students, and the work was certainly encouraging, as, in spite of the fact that it rained four nights out of the six, the total enrolment for that week was about one hundred and seventy-five, varying in ages from fifteen to fifty or more. The classes are held on Monday and Thursday evenings from 7.30 to 9.30. Thus far they have been very well attended, and they seem to be supplying a long-felt want.

COLLINGWOOD

EVENING INDUSTRIAL SCHOOL

Advisory Industrial Committee

Chairman—W. G. Corbman

MEMBERS OF THE SCHOOL BOARD

W. J. Henry, Collingwood Shipbuilding Co.,
Wm. Williams, B.A., Manager, Bulletin Printing Co.
Dr. E. L. Connolly, Druggist.
D. T. N. Mitchell, Shipper, T. Long Bros., Wholesale Grocers, etc.
E. S. Brown, Bookseller, Stationer, etc.
John Mair, J. P., Conveyancer, Real Estate, Loans, Insurance.

APPOINTED MEMBERS

W. G. Corbman, Foreman Carpenter in Wilson Bros. Sash Factory.
S. H. Lindsay, Manager Imperial Steel and Wire Co.
D. Williams, Editor Bulletin Pr. Co.
J. S. Shipley, Manager Collingwood Milling Co.
J. Harrison, Employee Imperial Steel and Wire Company.
Norman Rule, Clerk, Northern Navigation Company.

Staff

Principal: P. W. Brown, B.A.

Mechanical Drawing and Shop Work Mathematics: J. M. Duncan, B.A., Sc.

Dressmaking: Emily Hughes.

Millinery: Mary Farrow.

Mr. Duncan is a draftsman; Miss Hughes, a dressmaker; and Miss Farrow a milliner of the town. Each member of the staff is paid at the rate of $3.00 an evening.

Principal's Report

COURSE OF STUDY

Manual Training is given to the boys of the Collegiate Institute, Public Schools, and Separate Schools, but, so far, no Day Industrial Classes have been organized.

Evening classes have been established, with the following attendance: Millinery, 18; Dressmaking, 19; Mechanical Drawing, 12; Shop Work Mathematics, 12.

Each subject is taken twice a week in lessons of 2 hours duration.

The classes are held in the Collegiate Institute, and the equipment provided is of a workshop character, such as the teachers find necessary.

GENERAL REMARKS

The sentiment in favour of Manual Training and Household Science and Industrial Classes has increased greatly during the past two years. Last year we had difficulty in securing the required number for our evening classes. Our report this year certainly shows that such classes are growing in favour with the industrial population at least. Only a few of the local leaders of industry have, it is true, shown personal interest in this work, but we may safely say that very nearly all, if not all, look upon the movement with favour. As proofs of interest, it may be stated here that, when an opportunity was given, most of the leading manufacturers have visited the classes, and examined the work done by the students. One of them donated a number of tools and books for the use of these pupils. They would help matters on very greatly if they did more to induce young people to attend the classes by pointing out the benefits and offering them encouragement. The prospects, however, are good for a continued increase in interest and in the attendance.

GALT

EVENING INDUSTRIAL SCHOOL

Advisory Industrial Board

Chairman: J. N. MacKendrick

MEMBERS OF THE SCHOOL BOARD

J. N. MacKendrick, Manager of Gore Fire Insurance Co.
W. W. Wilkinson, Dry Goods Merchant.
Dr. J. S. Wardlaw, Physician.
W. H. Lutz, Secretary, Galt, Preston, and Berlin Street Railway.
Rev. R. E. Knowles, Minister of Knox Presbyterian Church.
D. Spiers, Manufacturer, Art Metal Co.

APPOINTED MEMBERS

J. H. MacGregor, Foreman of Department, Goldie and McCulloch Mfg. Co.
James Baird, Foreman of Department, Cowan Machinery Co.
Mrs. Hart, wife of Representative of Agriculture Department.
Miss Graul, Forewoman of Department, Turnbull's Knitting Factory.
Miss Gibb, Forewoman of Galt Knitting Co.
Miss Gobe, Forewoman at Getty and Scott's Shoe Factory.

Staff

Principal: Thos. Carscadden, M.A., Specialist in English.

Woodworking. Frank E. Braucht, M. Paed., Practical Carpenter, three years' course in the Department of Mechanical Engineering, University of Michigan. Three years as Machine Shop Instructor in the Technical and Arts School, Hamilton. $3.00 an evening.

Household Science. Miss F. A. Twiss, First Class Public School Certificate; High School Interim Certificate; Household Science Specialist; Undergraduate in Science in Applied Arts (3rd year standing) Columbia University, New York City, N.Y. $3.00 an evening.

Dressmaking. Miss Bertha Gerow, Head Dressmaker in the firm of W. W. Wilkinson, Galt; Twelve years' experience in dressmaking, two of which were spent in managing a workroom and two as head dressmaker; attended the Summer Session in 1912 at Columbia University, New York City, N.Y. $2.50 an evening.

Millinery. Miss M. Turner, Practical Milliner, ten years' experience; Forewoman in work-room of Miss Scott's Millinery Parlours, Galt. $1.50 an evening.

Principal's Report

EQUIPMENT AND ACCOMMODATION

A special equipment (value $85.25) has been installed for Millinery and Dressmaking, but the equipments used for Woodworking and Household Science are those of the Collegiate Institute, the values being $665.87 and $1,110.59 respectively.

Ample accommodation is provided in the Collegiate Institute. The Manual Training and Household Science rooms are used for the teaching of these subjects and two large rooms are available for the classes in Millinery and Dressmaking.

ATTENDANCE

The total number taking these Evening Classes is seventy, divided as follows: Woodworking, 14; Household Science, 23; Millinery, 8; Dressmaking, 25.

GENERAL REMARKS

For four years we have had Evening Classes in Woodworking and Household Science and a series of lectures on the Properties of Iron and Steel, and for two years now we have had classes in Millinery and Dressmaking. These classes meet once a week for two hours and the work continues from September till April. The number taking dressmaking has become so great that two classes have been formed, so that two evenings a week are given to this work.

Our experience is that young men and young women are unwilling to give more than one evening a week to this work. There are two reasons for this attitude: first, they have numerous other engagements; second, many of them feel the daily strain of eight to ten hours in the shop or the factory.

The general public appreciate the value of the work done in these classes, and the manufacturers give preference to boys who have had a course in Manual Training and have acquired some skill in the use of tools. They have, however, as yet, taken little interest in the Industrial Classes, and have done practically nothing to help on the movement.

The prospects here are slowly growing brighter. This year we are materially adding to the woodworking equipment, having ordered two wood lathes, one band saw, and one jointer at a total cost, including installation, of $717. If we succeed in securing a class for Mechanical Drawing and Pattern making, the value of the work done in the Evening Industrial Classes will be more apparent to the managers and the heads of departments in our factories.

Preston is a prosperous and growing town situated about two miles from Galt; in fact, the suburbs of the two towns almost meet. Three miles from Preston is the thriving town of Hespeler, and all three towns are connected by a trolley line with a half-hour service. A hundred pupils from Preston and Hespeler make daily use of this trolley line to attend the Collegiate Institute.

Now, the three towns could supply enough pupils to occupy the time of a thoroughly competent teacher of Dressmaking and Millinery for five afternoons and five evenings of each week; indeed the Women's Institutes of these towns promise the pupils, and are ready to guarantee a part of the cost of maintaining the classes.

A competent teacher to take charge of these classes could be secured for $1,200 to $1,500; and the Board would establish such classes in Preston and Hespeler as well as in Galt, if the Act were changed so that the Department could pay two thirds of the teacher's salary, though more than half the teacher's time would be given to classes outside of Galt.

The Collegiate Institute Manual Training and Household Science rooms and equipment would be still available for evening classes in these subjects in Galt. If Day Industrial Classes were established in Manual Training and Household Science, additional rooms and equipment would have to be secured, as the present rooms, teachers, and apparatus in these subjects are in use with the regular school classes.

GUELPH

EVENING INDUSTRIAL SCHOOLS

Chairman, Professor J. Evans

MEMBERS OF THE SCHOOL BOARD

H. R. Steele, Manufacturer of Iron Gates.
Prof. J. Evans, Professor of Manual Training, O. A. C.
D. Allan, Assistant Manager Bell Piano & Organ Company.
O. R. Wallace, Printer.
C. C. Dawson, Traveller for Canadian Gate Company.
W. Carroll, Clerk County Court.

APPOINTED MEMBERS

R. E. Emery, Manager Emery Manufacturing Co.
R. W. Gladstone, Manager Ingot Iron Culvert Co.
Walter Dawson, Kloepfer Co., Carriage Goods.
Thos. Hall, Representing Textile Workers.
Wm. Stephens, Woodworker, Bell Piano & Organ Company.
J. B. Parker, Moulder, Crowe's Iron Works.

All the classes are held on Tuesdays and Thursdays in the Central and Alexandra Schools. The hours are from 7.30 to 9.00 or 9.30.

Staff

Principal and Mechanical Drawing: W. E. Kendall.
Lecturer and Instructor in Manual Training and Mechanical Drawing, O. A. C.

Machine Shop Practice: W. M. Carnegie.
With Cowan & Walker, Contractors. Holder of Certificate from the Educational Department of Scotland. Has had experience in teaching subject.

Building Construction: Robert Gemmell.
Foreman, Tolton Bros., Implement Works. Certificate in Building Construction, Mechanical Drawing and Applied Mechanic for Paisley (Scotland) Borough Schools.

Mathematics: J. T. Power.
Teacher of Manual Training, Guelph Public Schools. A teacher of experience.

Woodworking: H. J. Craven.
Experienced Woodworker and Cabinet Maker. Has English Technical Certificates.

English (specially for Printers): Geo. R. Coombs.
On Public School Staff.

Dressmaking: Miss Foster.
A lady of experience in teaching Sewing and Dressmaking.
Assistants: Miss Stickney, Miss Ogg, Mrs. Aliller, Mrs. O'Connor.

Millinery: Miss Crossman.
A millinery expert.

Cookery: Miss J. Powell.
Graduate of Macdonald Institute. Has had teaching experience in Nova Scotia.

Home Nursing: Dr. Annie Ross.
Lecturer in Home Nursing, etc., Macdonald Institute.

SUBJECTS AND NUMBERS IN EACH

The Subjects taught are:

Machine Shop Practice	11
Building Construction	26
Mechanical Drawing	22
Woodworking	23
Mathematics	20
English (for Printers specially)	15
Dressmaking	150
Millinery	20
Cookery	32
Home Nursing	33
Total	352

GENERAL REMARKS

As the Evening Classes in Guelph have just (Jan. 1913) been organized, it is, of course, impossible to speak very positively as to their success; but, from the qualifications and experience of the teachers secured, the large number of students, and the prevailing spirit of enthusiasm, the Board and Committee feel warranted in expecting excellent results. No expense has been spared in furnishing the necessary equipment and supplies for the various classes. The lively interest taken by the members of the Industrial Committee, nearly all of whom are practical men in close touch with the industries of the city, and the personal attention and oversight given by them to the work, must greatly contribute to the success of the scheme.

No fees are charged for instruction. The instructors receive $3.00 per lesson of from one and a half to two hours.

Mr. Tench, the Principal first appointed, was unfortunately called upon to undertake important work in another city, and his loss is severely felt. His place has, however, been supplied by the appointment of Mr. W. E. Kendall, a member of the O. A. C. Staff, who from his long experience, and success as a teacher of technical subjects, will, it is confidently expected, prove thoroughly satisfactory.

STRATFORD

INDUSTRIAL EVENING SCHOOL

Advisory Industrial Committee

Chairman: R. Patterson

MEMBERS OF THE SCHOOL BOARD

R. Patterson, Master Mechanic, Grand Trunk shops, Stratford.
J. H. Gordon, Merchant Manufacturer of Gentlemen's Furnishings, Chairman Board of Trade.
J. C. Makins, K.C., Chairman of Board.
W. J. McCully, Merchant (Grocer).
R. J. Easson, Druggist.
A. H. King.

Appointed Members

Geo. McLagan, Manufacturer, Furniture.
Wm. Preston, Manufacturer, Flour Mills.
Wm. Strudely, Manufacturer, Imperial Rattan Co.
Thos Watson, Employee, Stratford Gas Co.
E. Meldrum, Employee, G. T. R.
F. Scrimgeour, Employee, McLagan Furniture Co.

Staff

Principal and English:

C. A. Mayberry, Principal: B.A., LL.B., Toronto. Two years Public School. Eight years Assistant, Collegiate Institute. Twenty years Principal, Collegiate Institute. Ten years Principal, Manual Training and Domestic Science School. Two years' experience in Woodworking and Ironworking.

Science: Electricity and Chemistry:

W. J. McMillan: B.A., Toronto. Specialist in Science. Five years in Public School. Three and a half years Science Specialist in High School or Collegiate Institute.

Mathematics:

W. L. Sprung: B.A., Toronto. Specialist in Mathematics and Physics. One year at Manual Training. Five years in Public School. Two years Mathematical and Science Master, High School. Two years Principal of High School. Five years Mathematical Master, Collegiate Institute.

T. Creighton: High School Assistant's Certificate. One year in Public School. Two years in High School.

Mechanical Drawing:

I. S. Clubine: Graduate, Macdonald Manual Training School, Guelph. Four years Public School. One year Manual Training Teacher. Two months' Shop Practice.

Domestic Science:

Miss Nellie Pearson: Normal School Certificate. Two years' course, Macdonald School, Guelph. Four years Public School. Three years Domestic Science School.

Miss Vera Davidson: Two years' course, Lillian Massey School. Normal Certificate in Household Science. One year at University of Toronto in Department of Modern Languages.

Dressmaking:

Miss Mary Gee: Forewoman in Dressmaking Department of Duncan Ferguson Company.

Miss P. Smalley: Assistant. Salary, $2.00 a lesson.

Each of the other members of the staff is paid $3.00 for each lesson of two hours.

Principal's Report

COURSES OF STUDY

The time given to the Evening Classes is as follows:
Mathematics: Two hours a week to each of three classes.
Drawing: Two hours a week to each of two classes.
Science: Two hours a week to each of one class (Chemistry and Electricity).
English: One hour a week to each of two classes.
Domestic Science: Two hours a week to each of four classes.
Dressmaking: Two hours a week to each of two classes.

Mathematics

The subjects taken with details of the courses are as follows:

First Year: Simple Rules, (addition, subtraction, multiplication, division). Metric system of weights and measures. Foot, Pounds, Seconds system. Fractions, vulgar and decimal. Practical measurements. Commercial arithmetic, involving percentage, interest. Mensuration: square, rectangular figures, circle, triangle.

Second Year: Review of principles of first year work. Advanced mensuration; cube, sphere, cone. Centre of gravity. Practical mechanics; simple machines, as—lever, pulley, inclined plane, wheel and axle. Units of force, work, energy, leading up to horse-power. Parallelogram of forces. Mechanics of fluids; pressure, hydraulic press, pumps, Archimedes principle, specific gravity.

Electricity

Batteries and cells; electrolysis; electroplating; storage cells; resistance amperes, volts, shunts; electric lighting and heating; electric bell; induction coils; telegraphy; telephone; dynamo motor; wireless telegraphy; X rays.

Chemistry

The elements, hydrogen, oxygen, nitrogen, sodium, potassium, calcium, carbon, chlorine and their more important compounds; chemical theory and equations.

Drawing

First Year: Mechanical drawing. Letter and figure sheet; scales and the application of the same; sheet on indication of materials. Geometrical drawing sufficient to lay basis for the future work in drawing. Drawing of simple objects in plan and elevation. Simple machine drawings emphasizing spacing and the principles of design. Inking in, tracing, and blue printing.

Second Year: Machine Drawing:—Riveting, screw-threads, the helix, bolts and nuts, joints and connections, pipes, shaft couplings, shaft bearings, hangers, swivels, ball bearings for shafts, roller bearings, pulleys, engine cranks, crank shafts, air pumps, connecting rods, cross heads, pistons, cylinders, valves, lathes, gearings, drills.

Development of surfaces:—Funnels, trays, pipes, pipe-elbows, tee joints in pipes and angular joints.

Architectural drawing:—Laws governing the erection and form of buildings of various kinds, foundation and frame work, roofing arches, doors, windows, stairs. Isometric drawing. Inking in. Tracing. Blue prints from tracings.

English

Outlines of grammar, correction of sentences, letter writing and composition, spelling, reading, writing.

Dressmaking

Correct measurement, adjusting patterns to measurements, cutting and fitting, making shirtwaists and skirts; building up on forms, plain sewing, use of sewing-machines, pressing, designing.

The course is intended to afford instruction in plain sewing and the making of plain garments to housekeepers and girls; special attention is given to the practical part of the work, each one being required to take part in cutting and fitting, and in fitting one another. Later on designing will form an important part of the course.

Domestic Science

Junior Year: Lessons on vegetables, fruits, eggs, milk, milk and eggs in combination, cheese, puddings (steamed, starchy, baked, etc.), flour mixtures including cakes, cookies and small cakes, bread rolls and pastry, meat (cuts of meat illustrated by diagram) made over meat dishes, fish, gelatine puddings and cold desserts, salads and salad dressings.

Senior Year: Review lessons on cake, lessons on cake icings, fancy cakes and macaroons, cream puffs, souffles (savoury and sweet), Christmas cooking including Christmas cake and puddings, mince meat and fancy pastry, croquettes, ices and frozen desserts, salads, meats, invalid cookery, preparation of and serving meals.

Attendance

In each subject the enrolment is as follows: Mathematics, 50; Electricity, 30; Chemistry, 10; Drawing, 35; English, 14; Dressmaking, 100; Domestic Science, 120; total: 359.

Accommodations and Equipment

Our classes this year are much larger than last, the total attendance for October and November being nearly as great as that of the six months of last season. The general public is sympathetic and we are much encouraged by the increased interest taken in our work. The present attendance has, however, been somewhat affected by the great amount of night work in the factories this fall.

The equipment and accommodation are practically those of the Collegiate Institute. The only additions that have been made are for dressmaking: 2 sewing-machines, 8 tables, 6 dress forms; also for drawing: drawing boards, T squares and set squares; total value $150.

General Remarks

I am more than ever convinced that the manufacturers can do a great deal to help this work. If some sort of arrangement could be made by which they would take into account the attainments of young men entering their employment, a great deal would be accomplished, and attention would be called to the needs of the mechanics. I am greatly impressed with the excellency of the system adopted by the G. T. R., whereby every boy is required to pass a rigid examination before entering the shops. This system has secured an excellent class of appren-

tices far above those in other shops in intelligence and promise. In addition to this entrance examination, the results of the evening classes held in the company's rooms are admirable—not only has the G. T. R. a fine, intelligent class of young men in its works, but there is among them an unusual spirit favourable to education. Mr. Patterson, the master mechanic, is heartily in accord with the work, is Chairman of our Advisory Industrial Committee, and spares no pains in spreading the idea of Industrial education as widely as possible. Our own classes are largely recruited from the G. T. R. shops, although the classes there number one hundred and twenty-five and are held twice a week. I have dealt with the case of the G. T. R. somewhat at length because it shows what can be done when the proper authorities take hold of the matter. Let me say again that I do not see why manufacturers should not take steps to find out the educational status of the boys they employ. It would not do for one or two to do this, but it would require a general plan. If the needs were known by the employers, I believe much would be done towards the solution of the problem of Industrial education.

Our classes, as I said, are encouraging; the aggregate attendance for the past two months has been about 2,600. The women and girls, however, are in the majority. When it is borne in mind that, in addition to our evening classes, there are the G. T. R. classes of over 125, and additional classes at the Y. M. C. A., it will be evident that the facilities in Stratford are unusually good. The lack of interest in those who should seek the benefit is our greatest obstacle, but I have no doubt that we are at the beginning of work which is bound to have great influence on the community.

And further, I hope that the discussion on Industrial education may in some way react on our educational system so as to give us more thoroughness in all classes of our schools. Under present conditions there is too much superficial work, and the complaint that our pupils learn nothing well is too well founded. Writing and spelling, we know, are both bad. Drawing, which might have an educative and practical value, is too often merely daubing colour on shapeless forms. I understand that the matter of drawing is now under consideration by the Department, and I hope that this subject may be considered with some regard to the needs of the Industrial class. Should we not aim at more definite and thorough results even if we have to show a more modest curriculum?

Special report of R. Patterson, Master Mechanic of the G.T.R. shops and Chairman of the Collegiate Board and the Advisory Industrial Committee.

Our Industrial classes opened on October 3rd, and the number now enrolled and still attending the classes, shows how popular they are and how much they have been required. It shows, also, that the efforts of the Government and the Board are being appreciated.

Stratford is essentially an industrial centre, with, of course, a large population of working people. A great many young lads and girls have, accordingly, to leave school at perhaps an earlier age than is usual. Of these a number work in the day time and attend the classes at night, thus assisting in keeping themselves or their parents and families, and acquiring an education which they could not otherwise get, and which gives them a fair chance with their fellows.

The Grand Trunk Railway, has for a number of years, taken care of its apprentices, boys from fifteen to twenty years of age, providing night classes for them in which they receive a first-class training in drawing and practical mechanics. We find, however, that many lads are compelled to leave school before they have

received sufficient education to enter our works as apprentices, for all who enter our service have to pass an examination which is fully equal to that for entrance into the High School. With, however, the present system of Evening Industrial Classes, the lads who could not enter our works as apprentices are able to obtain work and attend the classes, and in a year become able to pass their examination for apprenticeship in the shops. In this way they have an opportunity to become skilled workmen, earning good wages and reaching a much higher grade of occupation than they could have reached had the opportunity of attending these classes not been available. I have in mind several who attended last year's classes very regularly and who, with a little further effort on their own part this summer, were able to pass our apprentice examination this fall.

We have made an attempt at establishing Day Industrial Classes, but the result is very limited at present. We intend, however, to take this matter up vigorously between now and next September in the hope that we shall be able to establish them on a firm basis, more especially as Stratford is an industrial centre, and as an Industrial School located here would be both desirable for our own pupils and very convenient to the surrounding towns.

The attendance of students at the Evening Industrial Classes is good, and their attention excellent. Owing to the increased attendance, we have had to double the number of teachers we had last year. While the attendance of boys and men is very creditable, yet the attendance of girls and women has been beyond our most sanguine expectations. In Domestic Science, we have to maintain four separate classes per week, on four different nights.

The total enrolment of 359 pupils at the Industrial Classes is very satisfactory. It must, however, be remembered that it would be very much larger were it not for the fact that the Grand Trunk shops have 125 young men attending their own apprentice private classes on Monday and Thursday nights, the same evenings, it happens, as are those of the City Industrial Classes.

The attitude of the public toward evening classes is sympathetic, and, while taxes in Stratford are pretty high, and people are obliged to be as careful as possible in their expenditures, yet any amount required for the Industrial Class work has always been cheerfully given.

We have good hopes that the manufacturers will take a further interest in our Industrial Classes and will give boys who receive our diploma a preference in their shops, either by placing them in advanced positions, or by paying them better wages.

ST. THOMAS

EVENING INDUSTRIAL SCHOOL

Advisory Industrial Committee

Chairman: F. W. Wright.

MEMBERS OF THE SCHOOL BOARD

F. W. Wright, Master Painter M.C.R.
Adam Graham, Nurseryman.
Albert Roberts, Merchant Tailor.
Dr. C. C. Lumley, Dentist.
Dr. H. Honsinger, Dentist.
Albert Cowley, Hotelman.

APPOINTED MEMBERS

E. H. Thomas, President Thomas Bros., Brush Factory.
Wm. H. Heard, Lumber Merchant.
F. S. Ferguson, Manager Canadian Iron Corporation.
Zack Rowland, Tailor.
Chas. Rowley, Machinist, M.C.R.
Chas. Thompson, Cabinetmaker.

Staff

Principal: English and Bookkeeping:

A. Voaden, M.A., Specialist in English, History, and Commercial work. Eighteen years' experience in teaching.

Mechanical Drawing:

John McTaggart and Ernest Woodruff. Both foremen machinists, the former in the M. C. R. shops, the latter in the P. M. Railway shops. The former at one time was in charge of the M.C.R. day school.

Woodwork and Building Construction:

F. W. Bell. Of the firm Sanders & Bell, lumber and planing mill workers. A practical carpenter and millman, who had a "Correspondence School" course.

Science:

E. O. Liebner, B.A., Collegiate Staff. Science Specialist, Collegiate Institute. Eighteen years' experience in teaching science.

Workshop Mathematics:

V. K. Greer, M.A., Collegiate Staff. Specialist in Mathematics. Five years' experience in teaching.

Dressmaking:

Mrs. A. G. Sanders, a practical dressmaker, who had charge of a dressmaking establishment in this city.

Millinery:

Miss Stewart, head milliner for The Anderson Company, Ltd.

Shorthand and Typewriting:

T. W. Oates, Assistant Commercial Master, Collegiate Institute. Senior Leaving Certificate, with four years' experience in teaching.

The salary paid each teacher is $3.00 per night.

Principal's Report

COURSES OF STUDY

The Advisory Industrial Committee which was appointed by the St. Thomas Board of Education in September decided to open Evening Classes in Industrial work and advertised accordingly in the shops and factories. The following classes were offered:

(*a*) For Men:
1. Mechanical Drawing.
2. Science—for shop work.
3. Workshop Mathematics and Practical Mechanics.
4. Woodworking or Building Construction.

NOTE.—In the Drawing Classes, the officials of the M. C. R. Railroad have consented to all the use of the lessons on the subject prescribed by the New York Central lines to their apprentices.

(*b*) For Women:
1. Dressmaking.
2. Millinery.

(*c*) For Both—*Commercial.*
1. Bookkeeping and Business Practice.
2. Typewriting and Shorthand.
3. Practical English.

The organization is as follows:

(*a*) Drawing and Woodwork: Mondays and Wednesdays.
(*b*) Science and Mathematics: Tuesdays and Thursdays.
(*c*) English and Commercial Work: Mondays, Wednesdays and Thursdays.
(*d*) Dressmaking—Three sections: (1) Mondays and Wednesdays, (2) Tuesdays and Thursdays), (3) Fridays (married women only).

It was found necessary to engage an assistant in these classes.

The sessions last from October to December and from January to April; the evenings, Monday, Tuesday, Wednesday, Thursday, and Friday; the hours 7.30 p.m. to 9.30 p.m.

It does not seem advisable to ask students of the Industrial Night Classes to attend more than two nights a week and two hours a night, as the majority of students work hard eight or ten hours a day, and two nights a week allows them a certain amount of freedom. To secure regular attendance at these classes will ever be the chief difficulty. A great variety of excuses reach the principal—some trivial, some important. "The band is at the rink on Wednesdays," "I felt tired out last night," "The wife had company," "Lodge meets Thursdays," "I was called out," etc. Considerable tact is necessary in dealing with these. Principal and teacher must not fail to impress continually on the students the necessity for regularity. Judicious praise is of value, for those present; letters of inquiry and reports on attendance should be sent to those absent; certificates, if issued, should be made conditional on regular attendance.

Day Classes will hardly be introduced for a couple of years, at least.

The Michigan Central Railroad employs between two and three thousand men in this city. They have a successful day school for apprentices connected with their shops and Mr. Cross, Superintendent of apprentices, for the New York

Central lines, has expressed himself, from the point of view of the railway, as appreciating highly the efforts of the committee along the lines of Industrial and Technical Education.

Our Manual training system will, no doubt, be first extended so that Collegiate Institute pupils can get elementary work in Machine Shop Practice, Mechanical Drawing, Blacksmithing, and Household Science. Railway work is our chief industry, no fewer than five railways making this their divisional point. The effort of the Industrial Committee must, therefore, be directed towards benefiting those engaged in iron work and its various branches.

On the other hand, there are many pupils in the Public and High school who would attend a Day Industrial School if we had such. Three large boys fifteen years of age applied for admission to the Night Industrial Classes, but had to be refused admission as they were in the Junior Fourth Class at Public school. There were also many inquiries for classes in Domestic Science from pupils in night classes.

Attendance

The total registration was two hundred and fifty; one hundred and twenty-seven men, and one hundred and twenty-three women. The classes selected were as follows:

Mechanical Drawing, 44; Mathematics, 46; Woodwork, 12; Science—applied, 27; Dressmaking, 88; Millinery, 14; English, 7; Bookkeeping, 28; Shorthand and Typewriting, 27.

Accommodation and Equipment

On the completion of the present building operations of the Collegiate Institute there will be excellent accommodation for the classes in Applied Science, Practical Mathematics, Drawing, Dressmaking, and Millinery.

There is, however, a great need of accommodation and equipment for Household Science and Machine Shop Practice. It is the intention of the Board to provide for this work, in the near future, by the erection of a separate building on the Collegiate grounds for the use of the Collegiate Institute pupils and Evening Classes. Public school pupils will also be provided for by the establishment of a centre in each of the large schools.

1. For Science work, the Collegiate Institute equipment is sufficient.
2. In Woodwork, the Manual Training equipment is used with some special material brought from the mill. The teacher allows the students access to his mill to see the operation of the machinery.
3. In Drawing, the committee supplied T Squares, Drawing Boards, Scales, Triangles, Protractors, Models, etc., amounting to about Seventy-five Dollars ($75.00). All the equipment belonging to the old Art School or Mechanics Institute is also available for this class.
4. In Dressmaking the committee supplied six sewing-machines, irons, and pressing boards, forms, pattern paper and the necessary tables, amounting to about $100.00.
5. In Millinery about $25 has been expended in wire forms, trimmings, etc. In this class and in Dressmaking the students supply much of their own material.

For each department the value of the equipment would approximately be as follows:

Science (laboratories)	$1,844 00
Commercial (typewriters)	975 00
Woodwork	500 00
Drawing	195 00
Millinery	19 00
Dressmaking	150 00
	$3,663 00

The actual outlay, however, has not exceeded $250 so far, although much more might be expended on sewing-machines, etc. Some schools have, I believe, made a serious mistake in adding expensive equipment before the needs of the situation justified it. This is especially true in the case of the Machine Shop Work.

General Remarks

I have found a keen interest taken in the Industrial Classes by the Master Mechanics, Foremen, and Manufacturers. When called on they expressed a desire to assist personally in the work as far as possible.

Mr. W. H. Flynn, former Master Mechanic, M.C.R.R., has written as follows from Detroit:

"I sincerely wish you success in this venture. I have no doubt that these classes will become a permanent institution, since working people generally have been quick to discover the personal advantage to be gained."

The Labour organizations are in sympathy. The leading officers in the Machinists' Union are registered in the Mechanical Drawing Class.

Our Industrial Committee has been enthusiastic and helpful in the organization, and extension of this work.

A very satisfactory feature is the large attendance of men. This is due (1) to the fact that we selected two *capable* and *popular* young men as teachers, and (2) to the interest of the foremen in the shops who "rounded up" their apprentices and urged them to take advantage of the work.

It is quite evident, however, that before these classes can be a complete success, a great deal of educating will have to be done to convince the public of their importance. It seems to me that the real solution of the question of Industrial Education, can be found in the Day Industrial School, and in compulsory attendance, which will require every one to take advantage of these courses, up to the age of 16 years, at least.

Large Poster

ST. THOMAS
Industrial School

EVENING CLASSES

1912—COURSES—1913

Woodworking.
Building Construction.
Mathematics.
Mechanical Drawing.
Applied Science.

Dressmaking.
Millinery.
Commercial Work.
Practical English.

ANY person over fourteen years of age is entitled to attend these classes, if not enrolled in a day school.

Here is a chance for you to increase your earning power, cultivate your mind, and make yourself a more useful citizen.

There is no entrance examination. Circular and application form may be had at the office of this firm. The principal will be pleased to give information or advice to any one interested. He will be in the City Hall, evenings October 9th, and 11th from 7.30 to 9.30 to enroll intending pupils.

FALL TERMS:

October 28th to December 20th.

SPRING TERMS.

January 6th to April 30th.

We have pleasure in recommending these Classes of the St. Thomas Industrial School to our employees.

Firm Signature.

Circular for Distribution

St. Thomas Industrial and Commercial School

December 30, 1912.

DEAR FRIEND:

The St. Thomas Industrial and Commercial School will re-open on Monday, January 6th, for the second term which lasts till April 30th.

All students should be present on the first night that their class meets. "Nothing great can be accomplished without effort." You are urged to make the necessary sacrifices to attend regularly and follow the courses laid down by the teachers. You will be stronger mentally, a more useful mechanic, and a more valuable citizen by reason of your efforts.

It is probable that school will close with a banquet or entertainment at the end of the winter term.

Students kindly remember to bring the fee of One Dollar for the second term on the first night.

Call the attention of your friends to the re-opening and urge them to take advantage of the long winter term.

Wishing you a happy and prosperous New Year, I am,

Sincerely yours,

A. VOADEN, Principal.

F. W. WRIGHT, Chairman, Industrial Committee.

Notice of Absence

St. Thomas Industrial and Commercial School

Nov. 30, 1912.

DEAR FRIEND:

You attended ..... evenings out of ..... during November.

The courses of study are all carefully graded and you will readily understand that to miss several evenings will seriously handicap you in your work.

Do not let any trifling excuse keep you from your evening's work. We know that you are often tired after your day's labour, but you will be amply repaid for any sacrifices you may make by the increased powers and usefulness acquired.

Respectfully yours,

A. VOADEN, Principal.

CARD OF APPLICATION.—This card is already addressed to the Principal. The applicant has only to fill in, stamp, and mail it.

ST. THOMAS INDUSTRIAL AND COMMERCIAL SCHOOL APPLICATION FORM—EVENING CLASSES.

Name in full ..... Date .....
Address .....Age at Last Birthday .....
Occupation ..... Name of Employer .....
Name of foreman under whom you work .....
The form you were in when you left school .....
The subject you desire to take (1) .....
(2) ..... (3) .....
Special purpose, if any, in taking the course .....
Remarks .....

.....
Signature of applicant

NOTE.—It is important that every applicant should call and see the Principal as soon as possible after making application to arrange the subjects to be taken, as only certain combinations of subjects are possible. The Principal, Dr. Voaden, will be in the City Hall on October 9th, 10th and 11th, from 7.30 to 9.30 each evening, and will be pleased to give information and assistance in selecting courses.

Ontario College of Art—Antique Class, Evening

TORONTO

ONTARIO COLLEGE OF ART

Organization

The College is under the government of a Council of representatives and elected members, and was incorporated in 1912 under a special Act of the Provincial Legislative Assembly.

The Administration is under the immediate direction of a principal who, with a staff composed of representative artists of high reputation and wide experience as teachers, carries out a thorough course of instruction.

COUNCIL

Chairman.....James Loudon, LL.D.
Vice-Chairman..... C. T. Currelly, M.A.
Honorary Treasurer .....James P. Murray, J.P.
Auditor .....R. J. Dilworth, F.C.A.
Secretary of Council .....G. A. Reid, R.C.A.

REPRESENTATIVE MEMBERS

Mrs. Agar Adamson..... Canadian Society of Applied Art.
Walter S. Allward, A.R.C.A.....Canadian Art Club.
F. Bancroft.....Toronto Trades and Labour Council.
C. H. Acton Bond.....Toronto Society of Architects.
F. H. Brigden, O.S.A.....Ontario Society of Artists.
R. Y. Ellis..... Art Museum of Toronto.
R. F. Gagen, A.R.C.A..... Ontario Society of Artists.
A. H. Gregg.....Ontario Association of Architects.
T. G. Greene, O.S.A..... Graphic Arts Club.
G. A. Howell..... Municipal Council of Toronto.
James Louden, LL.D..... University of Toronto.
Edmund Morris, A.R.C.A..... Canadian Art Club.
James P. Murray, J.P.....Art Museum of Toronto.
W. C. Phillips.....Canadian National Exhibition.
Thomas Roden..... Canadian Manufacturers Association.
R. J. Stevenson.....Toronto Trades and Labour Council.
A. W. Thomas.....Canadian Manufacturers Association.
Edwin Utley.....Toronto Camera Club.

ELECTED MEMBERS

C. T. Currelly, O.Medj., M.A., F.R.G.S.
W. H. Elliott.
George H. Locke, Ph.D.
T. A. Reid.
Prof. J. Squair.

Staff

Principal, and Primary Classes and Day Costume Class: G. A. Reid, R.C.A.

Studied first at the Ontario School of Art, Toronto, and later at the Academy of Fine Arts in Philadelphia. Went to Paris, entering the Julien Academy and working under Benjamin-Constant. Also studied at the Prado Museum, Madrid. A member of the O.S.A., 1886, and President 1887-1901. Elected R.C.A., 1890, and President 1906-1909. Awarded the Combined Academies Prize for the painted figure at the Julien Academy, 1889, medals at the World's Fair, Chicago, and Louisiana Purchase Exhibition at St. Louis, 1904. Canadian representative on the Jury of Awards at the Pan-American Exhibition, 1901. Has been identified with Art education in Toronto for twenty-seven years, and instructor in the Ontario School of Art for twenty-one years.

Drawing and Painting from Life: J. W. Beatty A.R.C.A.

Studied first in Toronto, later at the Julien Academy in Paris under Jean Paul Laurens and Benjamin-Constant. Visited Spain, Belgium, and Holland. Elected a member of the Ontario Society of Artists, 1901, and Associate of the Royal Canadian Academy, 1903. Has had ten years' experience teaching studio and out-door drawing and painting classes. Is President of the Arts and Letters Club of Toronto for 1912 and 1913.

Antique Classes: W. Cruickshank, R.C.A.

Received his earliest Art training at the Royal Scottish Academy at Edinburgh. Here, at the instance of Sir Noel Paton, he made drawings for admission to the Royal Academy School, London, and obtained the seven years' studentship. Later he went to Paris, entering the studio of Yvon. Exhibited pictures at both the Royal Academy and Dudley Exhibition, London, mainly in the line of illustration. Lived for some time in New York, where his work in pen and ink attracted attention. Is credited with having introduced pen drawing with broad lines to America, and having established a nucleus around which the Art Students' League grew. Has been identified with Art instruction in Toronto for about thirty years.

Evening Costume Class, and Primary Classes: C. M. Manly, A.R.C.A.

Studied at the Toronto Art League, at the Heatherly School of Art in London, and at the Metropolitan School of Art in Dublin. Awarded honourable mention at the Pan-American Exhibition, 1901. Awarded the Jessie Dow Prize at the Montreal Art Association, 1911. Elected A.R.C.A. 1902. Member of the O.S.A., and President in 1903-5.

Modelling, and Primary Classes: Emanual Hahn.

Received his primary art education at the Ontario School of Art and Technical School. Later took courses at Stuttgart, Germany, in sculpture and allied lines in the Academy, Industrial School of Art and Polytechnicum; also making study trips through Italy, France, Germany, and England. For several years on his return worked with Walter S. Allward, A.R.C.A.

Design and Applied Art Classes, and Primary Classes: R. Holmes, A.R.C.A.

Studied in the Art School, Toronto, in the Royal College of Art, London, and in the University of New York. A member of the Ontario Society of Artists, and an Associate of the Royal Canadian Academy. For a number of years President of the Art Students' League, Toronto, and of the Graphic Arts Club, Toronto, and Vice-President of the Canadian Society of Applied Art. Pictorial work principally water-colours of the Canadian flora.

Secretary and Matron: Mrs. Alice F. Stewart.

The objects of the College of Art are as follows:

Principal's Report

(*a*) The training of students in the Fine Arts, including Drawing, Painting, Designing, Modelling and Sculpture, and in all branches of the Applied Arts in the more artistic trades and manufactures; and

(*b*) The training of teachers in the Fine and Applied Arts.

The courses of instruction in the College are in three divisions: The Fine Arts Course, The Applied Arts Course, and the Teachers' Course. These courses are so arranged that they may be taken separately or a student may pass through all three divisions.

The Fine Arts

The Fine Arts Course affords full facilities for the education and training of professional painters, illustrators, and sculptors.

Design and Applied Art.

The Design and Applied Arts Course provides a professional training in all branches of Pictorial and Industrial Design, and in their practical relation to Applied Art in the various crafts and manufactures.

Teachers' Course

The Course for Teachers is arranged for the training of teachers in drawing, painting, modelling, and design, and for imparting a general knowledge of the Fine Arts by means of lectures and an arranged course of reading in the literature of Art.

Duration of Courses

The duration of the study in the different courses is dependent upon the ability and industry of the student and also upon the amount of work previously done, but it is expected that the full course for associateship shall be as follows:—

Primary Classes, one year.
Drawing from the Antique, one year.
Elementary modelling, one year.
Elementary design, one year.
Advance modelling, two years.
Drawing and painting, two years.
Advanced design, two years.
Full course for Diploma of Associateship, four years.
Course for Teachers in Public Schools, one year.
Course for Teachers in High Schools, two years.

Admission

The College will admit beginners to the Primary Classes without formal examination. Tests will be made in every case for the purpose of placing the student in the class where the most benefit may be received.

Sessions

The college year is divided into two terms of fifteen weeks each, as follows:—
First Term:—October 1st to January 21st.
Second Term:—January 22nd to May 14th.

Class Hours

The hours of the principal classes of the general session are:—

Morning Classes, 9 to 12 m.; afternoon classes, 1 to 4 o'clock, and evening classes, 7.30 to 9.30 o'clock, except Saturdays.

The different classes are arranged as follows:

Primary Classes:—Daily, mornings, afternoons, and on evenings except Saturday.

Antique Classes:—Daily, mornings, afternoons, and on evenings except Saturday.

Life Classes:—Daily, mornings; and on evenings except Saturday.

Ontario College of Art—Costume Class, Evening

Modelling Classes:—Monday, Wednesday, and Friday afternoons, and Tuesday and Thursday evenings.

Costume Classes:—Tuesday, Thursday and Saturday afternoons, and Monday, Wednesday, and Friday evenings.

Sketch Classes:—Daily, advanced and primary, 12 to 1 p.m.

Design Classes:—Daily, mornings, afternoons, and on evenings except Saturday.

Lectures and Demonstrations:—Tuesday and Friday afternoons, 4 to 5 o'clock, and Saturday evenings, 8 o'clock.

Fees

For all classes and general privileges for one year, including Summer Schools	$100.00
For all classes and general privileges for one term	40.00
For one class every day and general privileges one term	30.00
For one evening class and general evening privileges, one term	10.00
For all classes and general privileges for outdoor Summer Painting School	30.00
For all classes and general privileges for Summer School for teachers and others	15.00

Spring and Summer Courses Public and High School Teachers

The Course for Teachers consists of work in drawing, modelling, painting, and design, and lectures, demonstrations, and reading course covering the various subjects required for the examinations for Public and High School certificates.

The Department of Education of Ontario has made provisions for study in the College according to a scheme contained in a circular which may be obtained on application to the Deputy Minister of Education, or the Secretary of the College.

General Courses

A ten-weeks' Spring Session and a six-weeks' Summer Session of the College are conducted for the benefit of teachers and others unable to attend the general session. The following is the syllabus of instruction for the first and second year:

First Year

Drawing: Elementary Descriptive Geometry and Mechanical Drawing, Elementary Perspective, Elementary Drawing from Geometrical Solids, simple objects and natural forms; elementary drawing from the antique and life, sketching in various black and white mediums, black-board drawing, drawing from Memory, elementary illustration.

Modelling: Elementary Modelling, modelling from details of antique cast, making of moulds, and casting in plaster.

Painting: Drawing with coloured chalks, exercises with the brush, simple oil and water-colour painting.

Design: Decorative treatment of natural forms, Geometric forms and ornament, Applied Design.

Demonstrations, Lectures, and Reading Course. Composition. Theory of Colour. Mediums for drawing and painting, mechanical processes of reproduction, synopsis of the History of Art, Critical Study of Works of Art, methods of teaching art in Public Schools, principles of Design.

Second Year

Drawing: Drawing from the antique, drawing from life, still life, landscape and architectural forms; sketching in various black and white mediums, blackboard drawing, drawing from Memory.

Painting: Drawing from life and still life with coloured chalks and pastels, Elementary Painting with oil and water-colours.

Modelling: Modelling from the antique, modelling from life.

Design: Decorative Treatment of natural forms, Historic Ornament, appropriate application of Design to crafts and manufacture.

Demonstrations, Lectures, and Reading Course: The Principles of Design and Applied Art. Composition. Theory of Colour, mediums for drawing, painting and modelling; History of Art, Critical Study of works of Art, perspective, Artistic Anatomy, methods of teaching Art with special reference to High Schools and Collegiate Institutes.

For Art Supervisors and Art Specialists

The courses for Art Specialists in the High and Continuation Schools and the Collegiate Institutes and for Art Supervisors in the Public and Separate Schools are contained in the circular of the Department of Education above referred to.

General Remarks

The foregoing is a brief prospectus setting forth the general working plan of the College as laid down at its inception at the beginning of this school year. This plan, with the accompanying curriculum and schedule of classes has not yet had a complete test, but it appears to be working out as anticipated.

ENROLMENT AND ATTENDANCE OF STUDENTS

The total enrolment of students for the first term was 118; of these 20 attended all classes, 24 attended half time, 33 attended 5 evenings per week, 18 attended 3 evenings per week, and the remainder have worked at different intervals according to their convenience. A great desire has been shown by many teachers of the Public and High Schools to place themselves in line with the new regulations, and some have begun to work without waiting for the free courses arranged for teachers by the Department of Education.

AGES AND OCCUPATIONS OF THE STUDENTS

The students are of all ages, from twelve years to thirty, except in the case of several teachers of more advanced years. The greater number of those working in the evening classes are occupied in some allied pursuit in the day time, or are preparing themselves for some new occupation in which drawing is required. The day students, and in many cases the evening students, are studying for the purpose of becoming illustrators, designers, sculptors, or painters. A number of them were students in the former School of Art or in private studios.

PREMISES

The College occupies the third story of the building formerly occupied by the Department of Education. These premises, while being considered only of a temporary character, are very suitable for the work. The rooms are spacious, well lighted, well heated, and well ventilated.

EQUIPMENT

The equipment, while adequate in some respects, and inadequate in others, would yet be considered ample in the best Art Schools and Academies. A large outlay must, however, be undertaken in the course of time to make proper renewals and to raise the facilities of the College to a proper standard.

PRESENT AND FUTURE MAINTENANCE

It is not to be supposed that the work of the College as now laid down is entirely new in Toronto or Ontario. The College as now constituted is the result of many repeated attempts to formulate a system of Art Education, and work of a fairly systematic character covering the past thirty-six years has been done by the Ontario School of Art, which was founded in 1876 by the Ontario Society of Artists.

While the plan of the Ontario College of Art has been largely framed on that of the Royal College of Art of London, the work of the former School, which has been taken over by the College, was based on the South Kensington System, which preceded the Royal College of Art.

A notable attempt to found a School of Art and Design for Ontario was formulated by the late Dr. Ryerson, then Chief Superintendent of Education, in 1856, and although perhaps a tardy fulfilment of his project, the premises partly intended at that time for the projected School, and the casts purchased for its use are now placed at the disposal of the College by the Department of Education.

For the maintenance of the College the Department of Education contributes $1,000 for the free tuition of Teachers during a spring and summer term, and the Ontario Government has made a grant of $3,000 for the present year, besides furnishing temporary accommodations for the College in the Normal School buildings, St. James' Square, which include heating and lighting. The fees are estimated at about $3,000 for the year, making a total revenue of about $6,500.

It may appear to those unacquainted with the requirements of such an institution that the aforesaid receipts should be ample resources, but to show that this is not the case it is only necessary to state that the Royal College of Art of London, with an enrolment of about twice the number of students, expended for maintenance about $46,000 in 1912. If the Ontario College of Art is to be properly maintained and made a credit to the Province, much greater resources than the above estimated revenue must be available.

An important part of the contemplated expenditure of the College will be free tuition scholarships in Painting, Sculpture, and Design. It is hoped that a considerable proportion of this amount will be obtained through contributions from various institutions to which the work of the College is allied. A fund is now being raised for Travel Scholarships, by citizens interested in Art, to enable the College to send several students abroad each year for a period of six months, and thereafter to return for a year of work at the College.

GENERAL REMARKS

It is often said (perhaps more by way of explanation than reproach) that as a people Canadians are lacking in taste and refinement because they are too busy building up the country to be able to give much time to such matters as beauty

Ontario College of Art—Elementary Class, Morning

in design and workmanship. This, however, can scarcely be true, for we can safely say that no people of the world have a greater desire for beauty both in Art and Nature, or give more time and energy to satisfy that desire. The explanation of our crudeness and lack of taste appear to be the meagre opportunities hitherto offered for the cultivation of taste and the acquisition of artistic knowledge.

It is to be hoped that the forward step, which has now been taken to establish a central institution for a system of Art Education, will entirely justify itself. This, however, will depend, not only on the teaching done by the Staff of the College, but very largely on the proper support of the institution by the public.

APPENDIX

The Montreal and Quebec Industrial and Technical Schools

Ecole Technique, Montreal—Front View

MONTREAL

I. TECHNICAL SCHOOL

Organization—Board of Directors

The Montreal Technical School was opened in September, 1911.

The administration is in charge of a corporation consisting of eleven members. Of these four are appointed by the Lieutenant-Governor in Council, two by the Council of the City of Montreal, one by the Council of the Montreal Board of Trade, one by the Council of the Chambre de Commerce of the district of Montreal, a delegate of the "labouring 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.

Staff

1. The school administration staff consists of:

The Principal, who reports to the several committees of the Board.

The Assistant Secretary-Treasurer, who is also Chief Accountant.

The Assistant Accountant.

The 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.

2. The staff of professors for theoretical instruction consists of:

The Principal.

Two Professors of Mathematics and Mechanics, one French, one English.

Two Professors of Drawing and Technology, one French, one English.

Two Professors of Physics, Chemistry, and Electricity, one French, one English.

3. The staff of workshop instructors consists of:

One Superintendent of Shops, who, under the control of the Principal, oversees all work of the several shops.

Two instructors in machine shop.

One instructor in forge shop.

One instructor in foundry.

One instructor in woodworking shop.

One instructor in electricity shop.

NOTE.—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.

Accommodations and Equipment

For its size, the building and equipment are amongst the finest in either America or Europe. The accompanying photographs show some of the elevations.

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, which is fireproof, comprises the offices of administration in the front, and behind them the several suites used for teaching, the latter including six class-rooms, two amphitheatres with a seating capacity of 100 each, a physical and mechanical laboratory, a chemical laboratory, a store-room for materials, a museum of industries, a library, recreation rooms, the apartments of the Principal, those of the Janitor, and those of the Engineer.

In the centre of the main building is a large semi-circular amphitheatre with a seating capacity of 650.

The class-rooms are large, well lighted, and well ventilated. There are in addition a lunch-room, a large waiting-room, hygienic toilet-rooms, and shower baths.

The workshops are laid out in exactly the same way as are the shops in industrial concerns, being provided with modern machinery (from Canada, United States, England, and France) and presenting the appearance of a large well-equipped workshop. The necessary plant for the generation of motor power, light and heat is situated in the centre surrounded by the various workshops.

The machine shop has an area of 11,340 square feet, the foundry room of 5,210 square feet, the forge room of 5,210 square feet, the woodworking shop of 6,811 square feet, and the electrical room of 2,714 square feet.

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.

Cost of Maintenance and Establishment

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 in 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, and showing a large deficit on last year's operations.

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.

Day School

ADMISSION

1. Residents of Canada or any other country are eligible for admission. The only restrictions are as follows: candidates must pass an entrance examination consisting of the following:—

(1) About 15 lines of dictation followed by a few questions in grammar.

(2) A short composition.

(3) A page in writing.
(4) A problem in arithmetic.
(5) A few questions on the history and geography of Canada.
(6) The elements of geometrical drawing (graphic construction).

2. No candidate is admitted to the examination without proof that he will be at least 14 years of age on the 1st September ensuing.

COURSES OF STUDY

The day courses are given in 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.

These courses are provided for young men who have recently completed an elementary academic course and desire to acquire manual proficiency and the education necessary to become skilled mechanics and competent foremen or shop superintendents. They are preparatory to the following occupations: Pattern maker, wood-worker, machinist-fitter, lathe-hand, electrician, moulder, blacksmith, draftsman, and in general to all positions connected with the metal, wood, or electrical industries.

The instruction is theoretical and practical.

(*a*) The theoretical instruction is technical in character and comprises the following subjects: Arithmetic, algebra and trigonometry, elementary and descriptive geometry, general and industrial physics, electricity, general and applied mechanics, drawing in all its branches, industrial technology, and such other subjects as may be approved by the Corporation.

(*b*) The practical instruction is given in the following shops: The wood-working and pattern making shop, the foundry, the forge shop, the machine shop and the electrical laboratory.

During the first year the work is not specialized; the pupils spend four successive periods of about two months in the machine shop, the woodworking shop, the forge shop and the foundry. At the beginning of the second year they make a definite choice of the course they intend to follow and specialize accordingly.

The normal length of the course is three years and to be promoted pupils must pass a satisfactory examination at the end of the first year and the second year. At the end of the course the corporation gives a diploma stating the course in each case, providing the student's examination is satisfactory.

At present the 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
Constructions 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

Ecole Technique, Montreal—Side View

FEES

The monthly tuition fees are $3.00 for the first year, $4.00 for the second year, and $5.00 for the third year, payable in advance the first day of every month. The school provides free of charge the necessary tools and materials for shop work and laboratories, but pupils are required to provide at their own expense text-books, copy books, drawing materials, etc.

Scholarships covering the whole or part of the tuition fees may be granted to pupils who pass the entrance examinations and whose family conditions justify this aid. At the end of the first or the second year, a total or partial reduction of the tuition fees may be allowed pupils attaining a high standing as regards both work and conduct. These scholarships are tenable for only one year.

TEXT-BOOKS

The following is the list of the text-books used during the present session in the English and French classes respectively:

ENGLISH

1st Year.—	*Geometry, Parts I-IV	Hall & Stevens	$1.00
	*Practical Mathematics	Cracknel	1.00
	*Elementary Applied Mechanics	Arthur Morley	0.90
	*Physics	Linebarger	1.25
	*Laboratory Manual	Millikan	0.45
	*Elementary Arithmetic	Hamblin Smith	0.60
2nd Year.—	Geometry (1st Year)		
	Practical Mathematics (1st Year)		
	Elementary Applied Mechanics (1st Year)		
	Physics (1st Year)		
	Laboratory Manual (1st Year)		
	*Chemistry	McPherson & Henderson	1.25
	*Laboratory Manual.	McPherson & Henderson	0.45
For Electricians only:			
	*Lessons in practical electricity	Swoope	2.00
3rd Year.—	Geometry (1st Year)		
	Practical Mathematics (1st Year)		
	Elementary Applied Mechanics 1st Year)		
	*The Heat Engine	Ripper	0.90
	Physics (1st Year)		
	Laboratory Manual (1st Year)		
	Chemistry (2nd Year)		
	Laboratory Manual (2nd Year)		
For Electricians only:			
	*Electrical Engineering	Rosemberg	2.00

NOTE:—Each year the pupils buy the books marked with an asterisk. Drawing materials may be had from the Professor.

FRENCH

1st Year.—	*Geometry, Parts I-IV	Hall & Stevens	$1.00
	*Practical Mathematics	Cracknel	1.00
	*Elementary Applied Mechanics	Arthur Morley	0.90
	*Physics	Linebarger	1.25
	*Laboratory Manual.	Millikan	0.45
	*Elementary Arithmetic	Hamblin Smith	0.60

Ecole Technique, Montreal—Main Entrance

2nd Year.—	Geometry (1st Year)		
	Practical Mathematics (1st Year)		
	Elementary Applied Mechanics (1st Year)		
	Physics (1st Year)		
	Laboratory Manual (1st Year)		
	*Chemistry	McPherson & Henderson	1.25
	*Laboratory Manual.	McPherson & Henderson	0.45
For Electricians only:			
	*Lessons in practical electricity	Swoope	2.00
3rd Year.—	Geometry (1st Year)		
	Practical Mathematics (1st Year)		
	Elementary Applied Mechanics (1st Year)		
	*The Heat Engine	Ripper	0.90
	Physics (1st Year)		
	Laboratory Manual (1st Year)		
	Chemistry (2nd Year)		
	Laboratory Manual (2nd Year)		
For Electricians only:			
	*Electrical Engineering	Rosemberg	2.00

NOTE:—Each year the pupils buy the books marked with an asterisk. Drawing materials may be had from the Professor.

Evening School

COURSES OF STUDY

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 present year for the following classes of workmen: Mechanics, wood-turners, pattern makers, blacksmiths. moulders, electricians, chauffeurs, firemen and stationary engineers, and draftsmen.

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 on 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 two dollars per month for the classes including workshop; the school provides free of charge tools and materials.

Courses in automobiles, $2.00 per month for each course.

The fees are one dollar 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.

SESSIONS

Evening classes are held on Tuesday, Wednesday, Thursday, and Friday, between 7.30 and 9.30 p.m. for shop work and drawing course, and between 8.00 and 9.30 p.m. for the other courses.

The following table shows the provision in 1912-13:

Subjects taught	Number of Classes and each Subject during 6 months							
	Woodworkers Pattern Makers	Mechanics	Blacksmiths	Moulders	Electricians	Chauffeurs	Firemen and Stationary Engineers	Draftsmen
Shop Work	50	50	50	50	.....	.....	.....	.....
Elementary Mathematics	15	15	15	15	.....	.....	.....	.....
Industrial Drawing	20	20	20	20	.....	.....	.. ..	70
Practical Mechanics	15	15	15	15	.....	.....	.....	.....
Electricity	.....	.....	.....	.....	46	.....	9	.....
Automobile	.....	.....	.....	.....	.....	46	.....	.....
Firemen and Stationary Engineers	.....	.....	.....	.....	.....	.....	37	.....
Total	100	100	100	100	46	46	46	70

II. Provincial Domestic Science School

ESTABLISHMENT

Besides the technical classes for boys and men, courses in Domestic Science have been established in the same building; 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 one thousand dollars a year from the Provincial Government. It receives in addition free rent, heat, and light from the Montreal Technical School.

COURSES OF STUDY

Here also courses are provided in both English and French.

The French classes comprise the following:

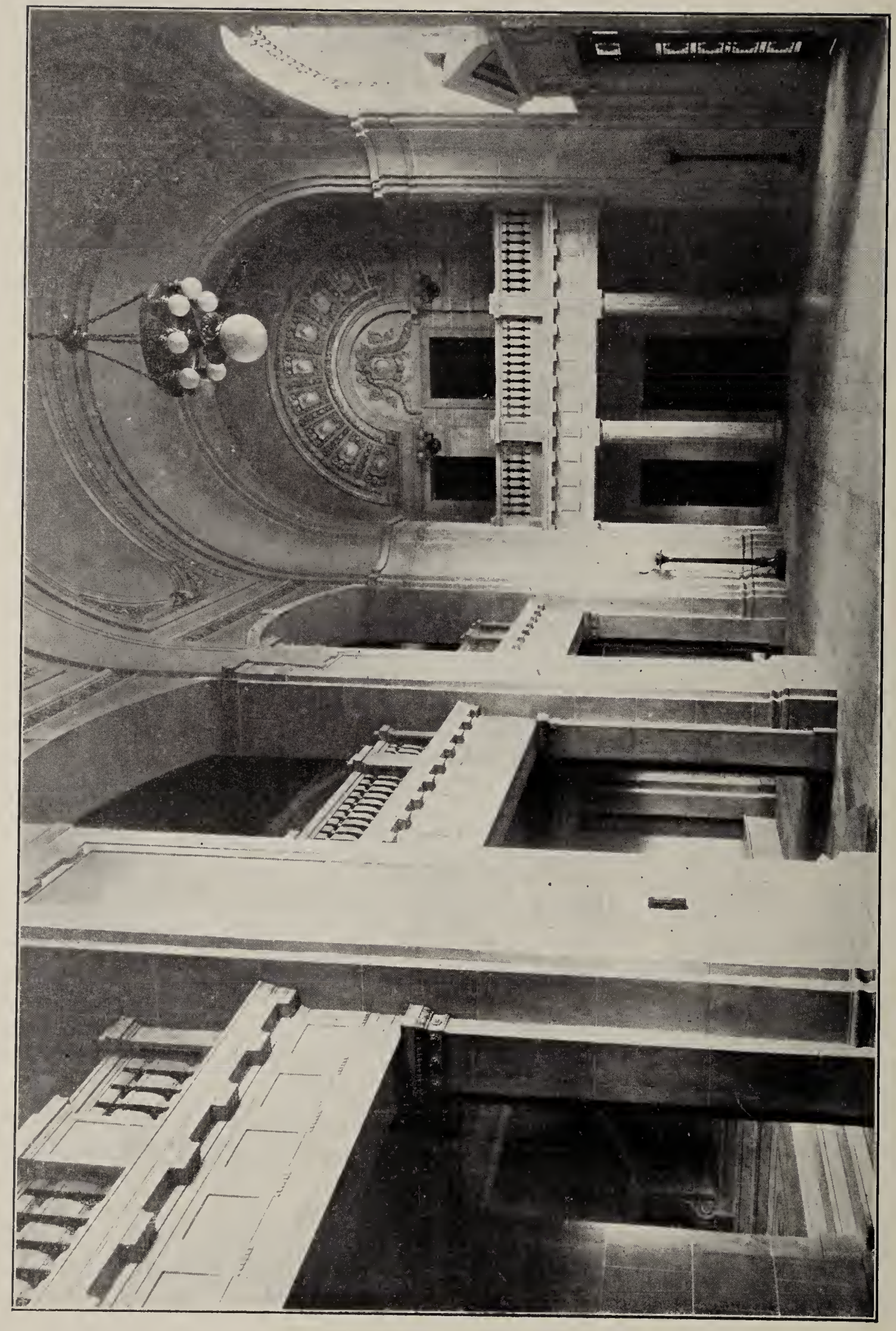
I. Cooking, dressmaking, mending, fashions, fancy work, household science, common law, gardening, household bookkeeping, hygiene, practical medicine, apologetics, and religious instruction.

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 vacational normal course of three weeks during the month of July.

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



Ecole Technique, Montreal—Entrance Hall

(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.

Quebec Technical School

ESTABLISHMENT

The Quebec Government has also provided 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.

Organization

The Principal of the Montreal school is also Principal of the Quebec one, 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, day classes, is six hours more than in Montreal.

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