

REPORT ON TECHNICAL EDUCATION

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Report on Technical Education by Bernard McEvoy

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BERNARD MCEVOY

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TECHNICAL
EDUCATION**

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ON
TECHNICAL EDUCATION

BY
BERNARD McEVOY

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FOR ONTARIO*

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PREFACE

IN the following pages an endeavour is made to set down in order some of the essential facts with regard to Technical Education, taking Toronto as a typical centre of population and work. In seeking to draw some lessons from the very numerous and extensive institutions in the United States which are devoted to Technical teaching, it was impossible to do more than select a few examples from a field which is surprising both for its extent and for the activity of its operations in educating those who are to deal, in future, with the material resources of that country. The information given is the result of observations made, at the instance of the Education Department for Ontario, in November, 1899.

CONTENTS

List of Principal Toronto trades in groups.....	5-6
Necessary Courses of Instruction—	
Scientific, theoretical.....	6
“ applied.....	6
Artistic.....	6
Commercial.....	7
Household.....	7
General Observations—	
Age of pupils.....	7
Fees or entrance exams.....	8
The teaching of theory.....	8
The technical school museum.....	8
The principal makes the school.....	9
Technical Institutions in the U.S.—	
Springfield Industrial Institute.....	10
Rhode Island School of Design.....	10
Philadelphia School of Industrial Art.....	10
Spring Garden Institute, Philadelphia.....	14
Franklin Institute, Philadelphia.....	18
“ School of Elementary Mathematics.....	18
“ Drawing School.....	18
“ Night School of Naval Architecture.....	19
Master Builders' Mechanical Trade School.....	20
Drexel Institute, Philadelphia.....	21
The Pratt Institute, Brooklyn.....	27
Worcester Polytechnic Institute.....	28
Massachusetts Institute of Technology.....	29
Stevens' Institute of Technology.....	30
Cooper Union, New York.....	30
Rochester Mechanics' Institute.....	33
Index.....	35

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(1.)—The great diversity of the trades carried on in Toronto is a feature with regard to the problem of technical education that demands some attention. The first thing in attempting to evolve a general plan for teaching workers such things as will help them in their daily tasks would seem to be to ascertain the sort of work they are likely to be engaged in. Speaking broadly, technical schools are for the purpose of giving instruction in:—

- a. The principles of science and art applicable to industries.
- b. The application of special branches of science or art to specific industries and employments.
- c. The use of typical tools, and such simple machines as embody the foundation principles of machinery in general.
- d. The principles and methods of commercial distribution, and such transactions as are connected therewith.
- e. The household branches of cooking, needlework and domestic management.

(2.)—The principal branches of industry which we have to consider in Toronto are as follows:

GROUP 1.—*Building*:—Brick-making, stone-cutting, brick-setting, carpentry, iron girder and pillar making, hoisting, forging, plastering, modelling, stone-carving, wood-carving, painting, decorating, glazing.

GROUP 2.—*Metal-working*:—Moulding, iron and brass founding, sheet metal working, wire-working, tin-plate working, bridge making, boiler making, plumbing, forging, japanning, grinding, polishing, enamelling, silver and silver-plate working, goldsmith's and jewellery work, gilding, electro-plating, engraving, enamelling (gold and silver), chasing.

GROUP 3.—*Machine Construction*:—Pattern-making, die sinking and tool making, electrical engineering, ship building, agricultural machine making, carriage and waggon making, planing, fitting, turning, bicycle making, engine and machine building, engine driving.

GROUP 4.—*Earth Trades*:—Mining, agriculture, horticulture, road-making.

GROUP 5.—*Printing*:—Type-setting, pressing, lithography and engraving, type-founding, book-binding.

GROUP 6.—*Chemico-Vitreous Trades*:—Glass making, soap and chemicals making, pottery, dyeing.

GROUP 7.—*Human Requisites*:—Carpet weaving, garment making, hat making, millinery, furniture and cabinet making, flour making, baking, boot and shoe making, rubber working, food making.

GROUP 8.—*Commercial Distribution*:—Clerking, railroading, book-keeping, telegraphy, warehousing, packing and shipping.

GROUP 9.—*Household*:—Cooking, sewing, dressmaking, domestic management, household decoration.

(3.)—The courses of instruction necessary to meet the requirements of these trades and callings are as follows:—

SCIENTIFIC—THEORETICAL.

1. *Mathematics*:—Arithmetic, algebra, plane and solid geometry.
2. Theoretical mechanics and dynamics.
3. Sound, light, and heat.
4. Magnetism and electricity.
5. Chemistry, inorganic and organic.

SCIENTIFIC—APPLIED.

1. Chemical laboratory practice.
2. Machine construction and drawing.
3. Building construction and drawing.
4. Naval architecture.
5. Steam.
6. Electrical engineering.
7. Metallurgy.
8. Carpentry, workshop practice.
9. Metal working, workshop practice.

ARTISTIC.

1. Freehand outline drawing from the "round" or solid forms.
2. Perspective.
3. Shading from the round or solid forms.
4. Drawing the human figure or animal forms from the "round" or from nature.

5. Anatomical studies of the human figure or animal forms.
6. Drawing flowers, foliage and objects of natural history from nature.
7. Painting ornament from the cast.
8. Painting the human figure or animals in monochrome from casts.
9. Painting flowers, drapery and groups of still life as compositions in colour.
10. Modelling ornament.
11. Modelling the human figure.
12. Elementary design, and the conventional treatment of natural objects.

COMMERCIAL.

1. Business customs, invoices, commercial paper, bills of lading and manifests.
2. Book-keeping, principles and practice of single and double entry.
3. Correspondence, arrangement and style of business letters.
4. Commercial Geography, physical and mathematical geography in their relations to business.
5. Banking and Finance, outlines of the history of banking and of the Canadian banking system, savings banks, trust and financial companies.
6. Mechanism of commerce, boards of trade, stock and produce exchanges, transportation, warehousing, importing and exporting, duties, exchange, mercantile agencies.
7. Commercial Law. Elementary principles of contracts and negotiable paper, and the leading principles which regulate the relations of the business man, principal and agent, carriers, commission merchants, partnerships, joint-stock companies.
8. The French and German languages.

HOUSEHOLD SCIENCE AND ARTS.

1. Household economics, cookery, food values.
2. Sewing, dressmaking, millinery.
3. The decoration and furnishing of the home.

GENERAL OBSERVATIONS.

(4) *Age of Pupils.*—The result of my inquiries among directors of technical schools in the United States and in Great Britain is that the age of sixteen should be regarded as the minimum for pupils undertaking special technical studies with a view to their commercial utility. Sir Andrew Noble in a recent address at the City and Guild's Central Technical College, London, said: "In my judgment, the age at which a boy should seriously begin any special studies