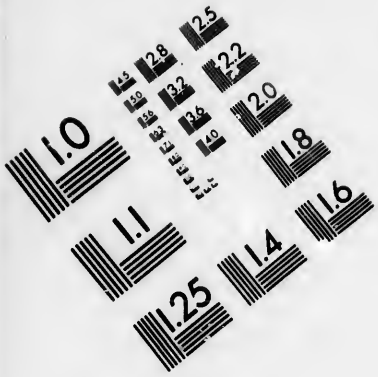

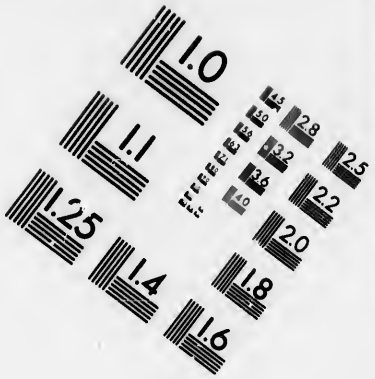

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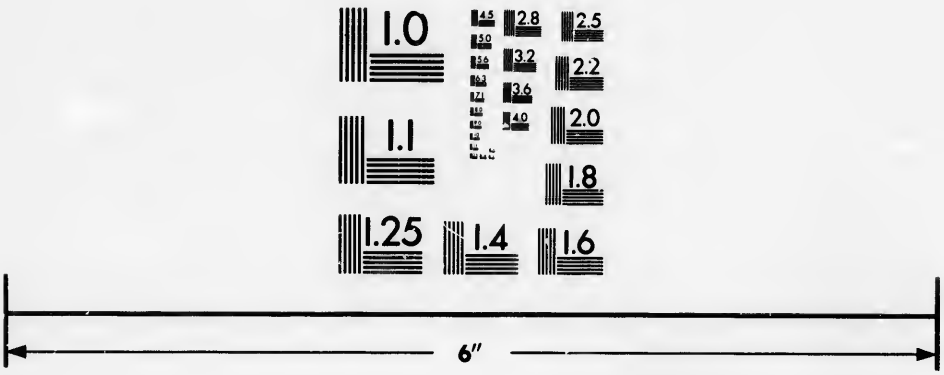

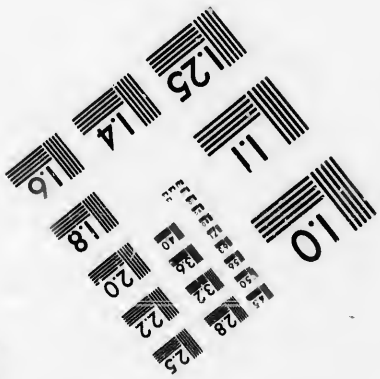

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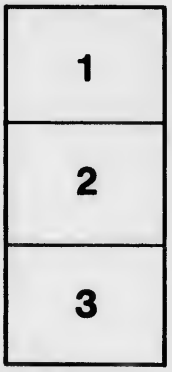

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McGILL UNIVERSITY

FACULTY OF APPLIED SCIENCE.

SPECIAL ANNOUNCEMENT

FOR

SESSION 1891-92.

McGILL UNIVERSITY.

FACULTY OF APPLIED SCIENCE.

SPECIAL ANNOUNCEMENT.

The Faculty has much pleasure in announcing that the new Applied Science Buildings will be completed and ready for occupation in September next.

Five distinct Departments have been established in the Faculty in which courses of instruction are especially arranged for students entering the professions of

(a). Civil Engineering and Surveying.
(b). Mining Engineering.
(c). Mechanical Engineering.
(d). Electrical Engineering.
(e). Practical Chemistry.

Students who pass the Matriculation Examination (see University calendar) are admitted into any one of the courses they may select, and will receive *special instruction* in such course *throughout the four years* over which it extends.

The courses are designed to afford a thorough training both of a theoretical and a practical character.

The work in the class-room is intended to give the student a general training, as well as to inculcate those principles upon which he must base his professional career. Full courses of lectures are given in Mathematics, Chemistry, Surveying, Physics, Mechanism, Zoology, Geology, Applied Mechanics,

Thermo-dynamics, Hydraulics, Geodesy, Mineralogy, Metallurgy, Assaying, Electrical Engineering, Mining, and also in Modern Languages.

Students are not expected to attend the lectures in all of these subjects, but only those which have special bearing upon the profession which the student intends to pursue, and those which are considered to be of the greatest educational value.

A sound education in general literature and modern languages is considered most important, and the student should bear in mind that many valuable technical works on engineering and chemistry are only available to the student of French and German. The Faculty would strongly recommend intending candidates to take at least two years of an Arts course before entering upon their professional studies. They would never regret the time so spent. Generally speaking, too, students in the Arts Faculty have no class-work in the afternoons, and they might therefore take up the shop-work in the Applied Science Faculty, so that when they enter the latter Faculty as undergraduates they would have more time to spend upon advanced work in their theoretical studies or in the laboratories.

The practical part of the work is provided for in the workshops, laboratories, and as further described in the remarks on the several Departments.

LABORATORIES, WORKSHOPS, &c.

LABORATORIES.—In the McDonald Technical Building there are ten laboratories, viz.:—

Nos. I and II. Testing Laboratories.—The equipment of these includes a 100-ton Wicksteed and a 75-ton Emery machine for testing the tensile, compressive and transverse strength of materials. For the former, an addition has been specially designed by means of which the transverse strength of members up to 25 feet in length, can be determined. The Emery machine is constructed and graduated with such accuracy as to render possible delicate experiments on elasticity. The laboratories are also provided with an autographic torsion machine for testing the torsio-

nal strength of materials, machines for carrying out experiments similar to those of Wöhler, Spangenburg, etc., for determining the effect of repeated stresses, oil testers, steam extensometers, etc., and a very complete supply of gauges, micrometers, and other apparatus for exact measurements. The Laboratory of Mechanics is fully equipped with a variety of apparatus, such as chronographs for measuring small intervals of time, pendulums for determining the acceleration of gravity and other dynamical constants, machines (Attwood's and Morin's) for deducing the laws of falling bodies, etc. Frequent practical questions are given to test the thorough character of the student's mathematical knowledge.

No. III. An Hydraulic Laboratory.—Here the student will study practically the flow of water through orifices of various forms and sizes, submerged openings, over weirs, through pipes, mouth pieces, etc. For this purpose there are suitably designed tanks, the largest having a height of 30 feet and a section of 25 square feet, pressure gauges of different kinds, and other apparatus. The students will also themselves carry out tests upon hydraulic motors, e.g., upon the different classes of turbines, pumps, the Knight and other wheels, etc. The facilities for conducting such experiments are unusually great, as from the city water supply there is an available head of over 200 feet.

No. IV. A Cement Testing Laboratory.—The importance of tests of the strength of mortars and cements is very great, and the equipment of the laboratory for the purpose is on a most complete plan, including a one-ton dead weight tester, a one-ton spring tester (Faïja), steaming apparatus, special weighing hopper, spring balance, gun metal, moulds, etc. The laboratory is also fitted with cisterns in which the briquettes may be submerged for any required time.

Nos. V. and VI. Thermodynamic Laboratories.—The Thermodynamic Laboratory is furnished with an experimental steam engine of 80 I.H.P., specially designed for the investigation of the behaviour of steam under all possible conditions; there are four cylinders which can be connected so as to allow of single, compound, triple or quadruple expansion, condensing or non-condensing, with or without jackets. The measurements of heat are made by means of large tanks, which receive the condensing water and the condensed steam. There are two hydraulic absorption brakes for measuring the mechanical power developed, and an alternative friction brake for the same purpose. The laboratory is further equipped with a variety of apparatus for the investigation and illustration of the general principles of thermodynamics, including hot air and other engines, indicators, pyrometers, pressure gauges, etc.

Nos. VII. and VIII. Electrical Laboratories.—The equipment of the Electrical Engineering Laboratory includes a high speed steam engine coupled direct to a dynamo for incandescent lighting; a slow speed steam engine for driving the experimental dynamos. These latter have been chosen to represent the best types now in general use, both of high tension and low tension direct current dynamos—with various methods of winding, and also of alternating current dynamos of low tension, and of high tension for use with transformers.

Arrangements have been made for measuring the mechanical power supplied to the dynamos and given out by the electro motors, of which there are several types; these arrangements comprise various forms of belt, rope and transmission dynamometers, with a very perfect form of hydraulic absorption dynamometer, with which the accuracy of the others can be checked by readings in absolute measure; the well known form of cradle dynamometer, for dynamo testing, of course, finds a place here, and special facilities are provided for varying the speed of the dynamos within any required limits.

The instruments for making the electrical measurements have been selected with much care; these instruments will enable measurements of current resistance, and difference of potential to be made with great accuracy, not only in the detached laboratories but in the dynamo room when the machinery is running; in separate rooms there are standard instruments of extreme precision with which the correctness of the working instruments can be readily checked. These include amongst others, two of Sir William Thomson's beautiful electric balances. There are also a variety of instruments for special purposes connected with electrical measurements, such as instruments for determining coefficients of self and mutual induction, etc.

No. IX. Metrological Laboratory.—In this laboratory will be placed a Roger's comparator for the investigation of standards of length, and linear and angular dividing engines for the graduation of standards of length and of angular instruments. The laboratory will also contain absolute standards of length up to one hundred feet for standardizing chains, tapes, rods, etc., pendulums and other apparatus for the determination of gravity, etc.

DRAWING.—One large drawing room occupying the whole of the fourth storey of the Technical Building, is lighted from the roof, and covers an area of nearly 9,000 square feet. The course in drawing includes Freehand and Model Drawing, Descriptive

Geometry and Topographical Drawing, the preparation of the drawings of parts of machines and other structures, and finally complete machine and structural designs.

MUSEUM.—In addition to the Peter Redpath museum with its splendid collections of minerals, fossils, etc., students will have the use of a Technical Museum, occupying the whole of the third story of the MacDonald Building. Amongst other apparatus the museum will contain the Reuleaux collection of kinematic models, presented by W. C. MacDonald, Esq., and pronounced by Professor Reuleaux to be the finest and most complete collection in America.

WORKSHOPS. -The workshops, erected on the Thomas Workman endowment, are now completed, and are fully equipped with machinery of the best and most modern type. Students will be specially trained in the several shops, under the direct superintendence of the Professor of Mechanical Engineering, aided by skilled mechanics, and will obtain a practical knowledge of the use of tools in carpentry, turning, pattern-making, smith-work, moulding and casting, and in machine tool-work.

NOTE.—A very fine building, fully equipped with laboratories and apparatus for the study of Experimental Physics, is now in course of erection on the University grounds, and will be available for the use of students in the Faculties of Arts and Applied Science.

DEPARTMENTS OF INSTRUCTION.

(a). CIVIL ENGINEERING AND SURVEYING.—Full details of the courses of lectures and practical work in this department, will be found in the Faculty Announcement in the University Calendar.

FIELD ENGINEERING AND SURVEYING.—Each student is expected to take part in the following:—

1. A chain survey. 2. A contour survey based on 1. 3. Compass surveys with and without local attraction. 4. A plane-table survey. 5. The preliminary surveys and location of a line of road, the work being after-

wards set out for construction. 6. The hydrographic survey of a channel in the St. Lawrence river. 7. A triangulation survey from one base, checking on a second base. 8. The precise measurement of two base lines. 9. Differences of level by spirit level, triangulation and barometer. 10. Determinations of latitude and the meridian. 11. Determinations of time by a portable astronomical transit, by sextant, and by the solar attachment. 12. Exercises on the comparison of clocks and chronometers. 13. Practice in the use of field magnetic instruments.

Students engaged in these surveys are expected to keep complete notes, and from them to prepare all plans and sections required. The necessary instruction in topography and mapping is given in the drawing room.

The large drawing rooms are fitted up with suitable mountings for the various instruments, in order to permit of their use and investigation during the winter months. The present equipment of surveying instruments includes :—

Six transits and transit-theodolites.
Seven levels.
Four sextants.
Two plane tables.
Three surveyor's and three prismatic compasses.
Three current meters.
A 300 foot steel tape arranged for basework.
Hand levels, chains, rods, tapes, barometers, pedometers and other minor instruments.

(b). MINING ENGINEERING.—In this Department the work includes such portions of the Civil and Mechanical Engineering course as are essential to the education of a mining engineer. A thorough training is provided for in geology and mineralogy, and, in order to give a practical character to the work, frequent geological excursions are made and numerous minerals and rocks are determined and analyzed in the laboratory. In the lectures special attention is devoted to the economic aspects of geology.

Work in the chemical laboratory is begun in the first year and continued throughout the course, mainly consisting in the fourth year of assaying by the dry, wet and electrolytic methods. In the third year a special course of lectures on mining is given. It is illustrated by diagrams and models, and includes the discus-

sion of blasting, quarrying, hydraulic mining, boring; special methods of exploitation employed in the working of metalliferous deposits and coal seams; ventilation of mines, pumping, etc. In the fourth year, the lectures on metallurgy are illustrated by diagrams, models and collections of ores and metallurgical products.

As yet there is no special mining laboratory in which practical operations in ore-dressing, etc., might be carried on, but it is hoped that this deficiency will be supplied in the near future. Hitherto the lectures on mining and metallurgy have devolved upon the Professor of Chemistry, but it is intended that before the beginning of another session, these subjects will be represented by a special lecturer or professor.

(c). MECHANICAL ENGINEERING.—Full details of the courses of lectures and practical work in this Department, will be found in the Faculty Announcement in the University Calendar.

(d). ELECTRICAL ENGINEERING.—This Department is now for the first time placed upon a firm basis, Mr. W. C. McDonald having generously endowed the chair of Electrical Engineering. Complete information as to the courses of lectures and the practical work will be given in the University Calendar.

(e). PRACTICAL CHEMISTRY.—The work in this Department is intended to prepare students to act as analytical chemists and assayers, or as teachers of the science. The training which it affords would also be of the greatest benefit to young men entering various departments of commercial life. The purely chemical part of the course includes lectures and laboratory work, these together occupying a large proportion of the student's time.

During the first year the laboratory work comprises the construction and use of ordinary apparatus and the performance of a series of experiments which are designed to cultivate the student's powers of observation and deduction. Qualitative analysis is begun during the latter part of the first year and continued during most of the second, when quantitative work is taken up and carried on during the remainder of the course.

Special attention is generally devoted to mineral analysis and the preparation of inorganic compounds, but in the fourth year considerable latitude is allowed to students in the choice of subjects, and organic analysis and the preparation of organic compounds may, if desired, be taken up. The analysis of iron and steel will hereafter receive special attention, and also the application of electrolytic methods to the estimation of copper, nickel, &c.

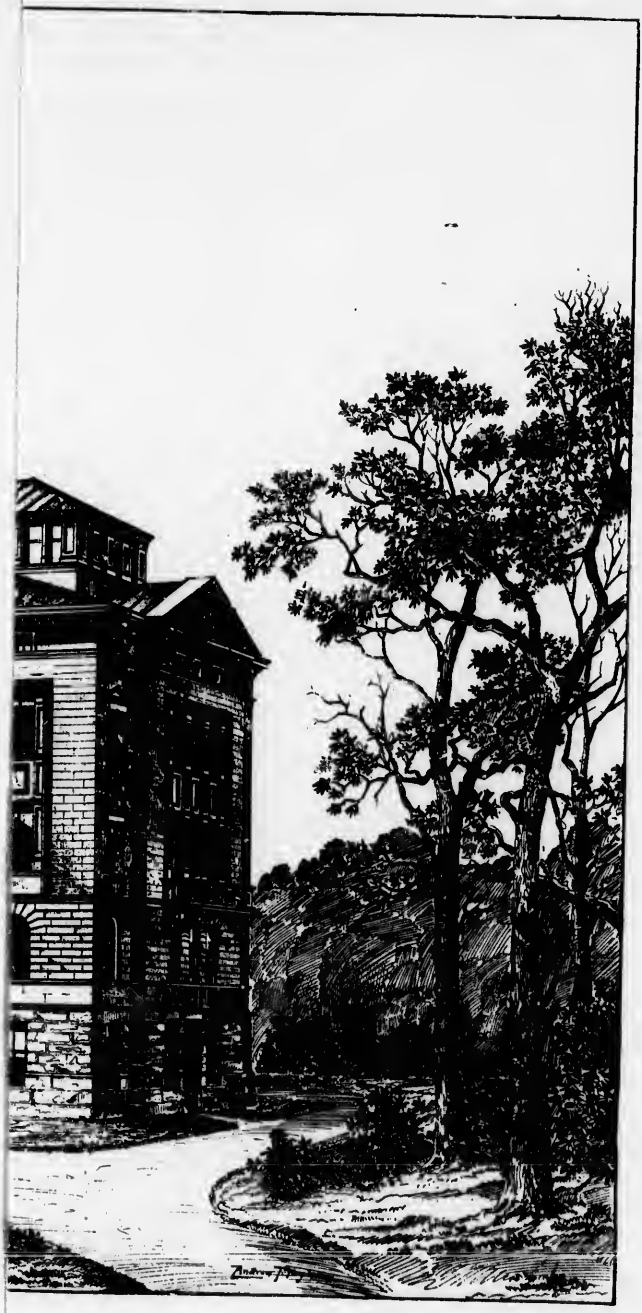
The chemical laboratories are three in number, one for students of the first year, one for students of the second and third years, in which it has been found necessary to carry on both qualitative and quantitative work, and one which is reserved for students of the fourth year and for special students who may wish to carry on original investigations. The fittings of this last room were the gift of Mr. W. C. McDonald and are quite equal to those found in the best laboratories abroad. Besides the above there is also a special room in the basement which is fitted up for fire assaying.

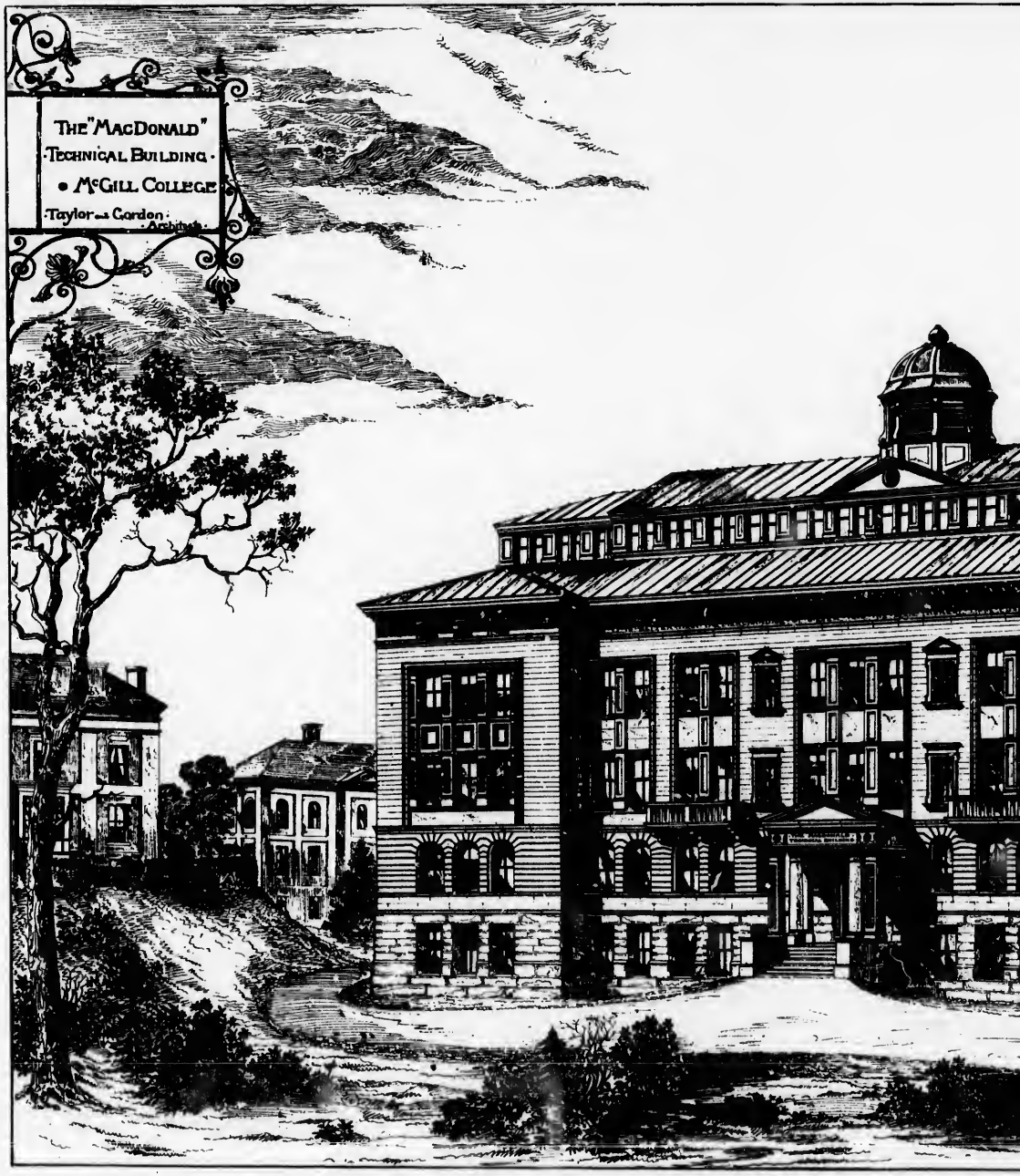
The laboratories are supplied with four balances by Becker & Sons, one Bunge and a bullion-balance by Trœmner. There is also a Laurent polariscope, a spectroscope by Dubosque, gas combustion and melting furnaces, apparatus for electrolytic work, &c., &c. Distilled water is obtained by means of a special boiler placed in the basement, which also supplies the steam for drying ovens, steam-baths and drying chamber in the upper laboratories.

FEES.—The full fees for each course are $100 per annum.

Further information may be obtained on application to the Dean of the Faculty, or to Mr. J. W. Brakenridge, Acting Secretary of the College.

HENRY T. BOVEY,
Dean of the Faculty.




THE "MACDONALD"
TECHNICAL BUILDING
McGILL COLLEGE
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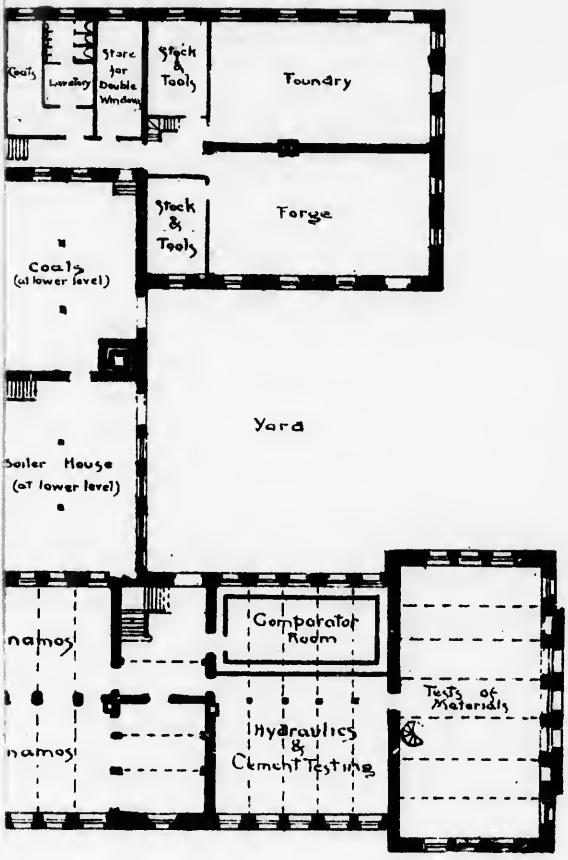
Architects



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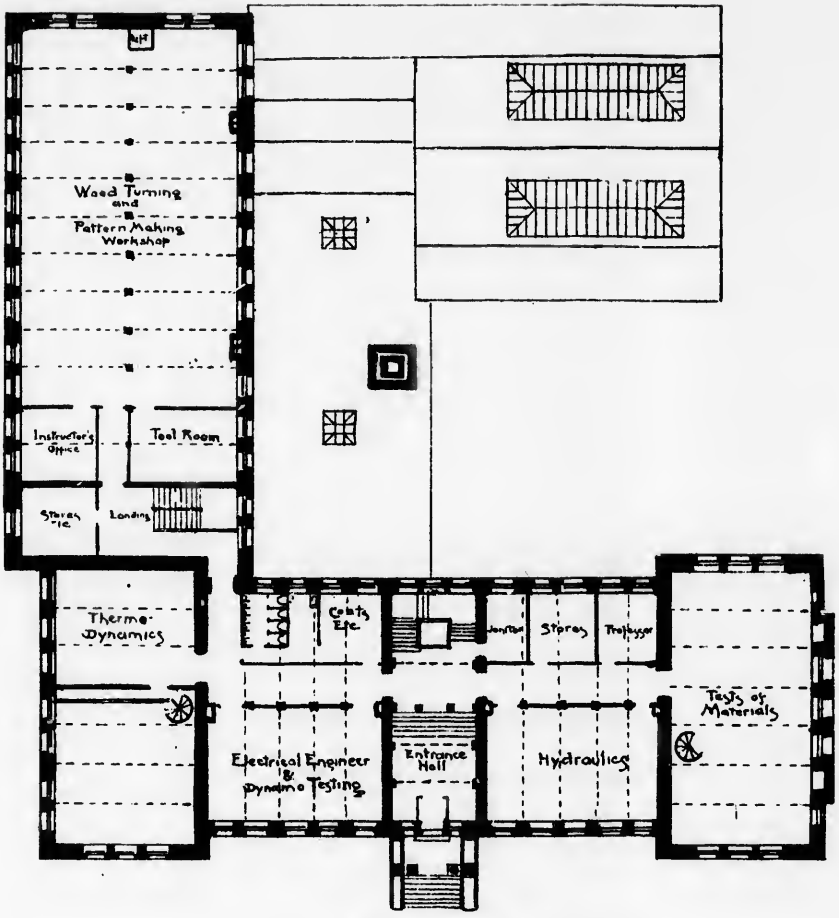

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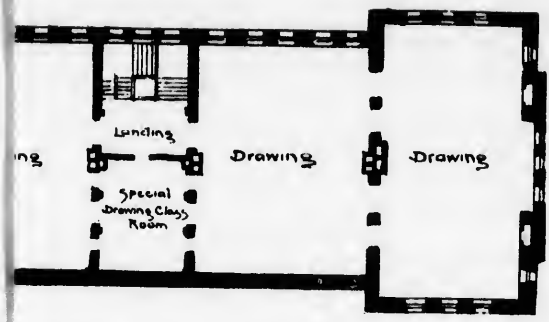

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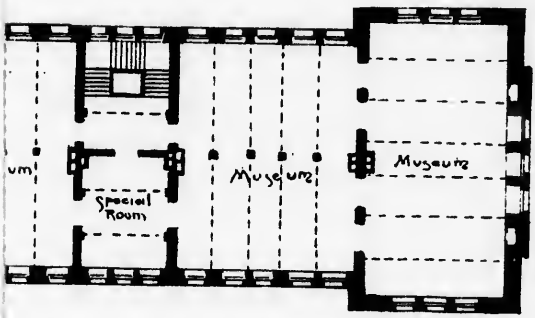

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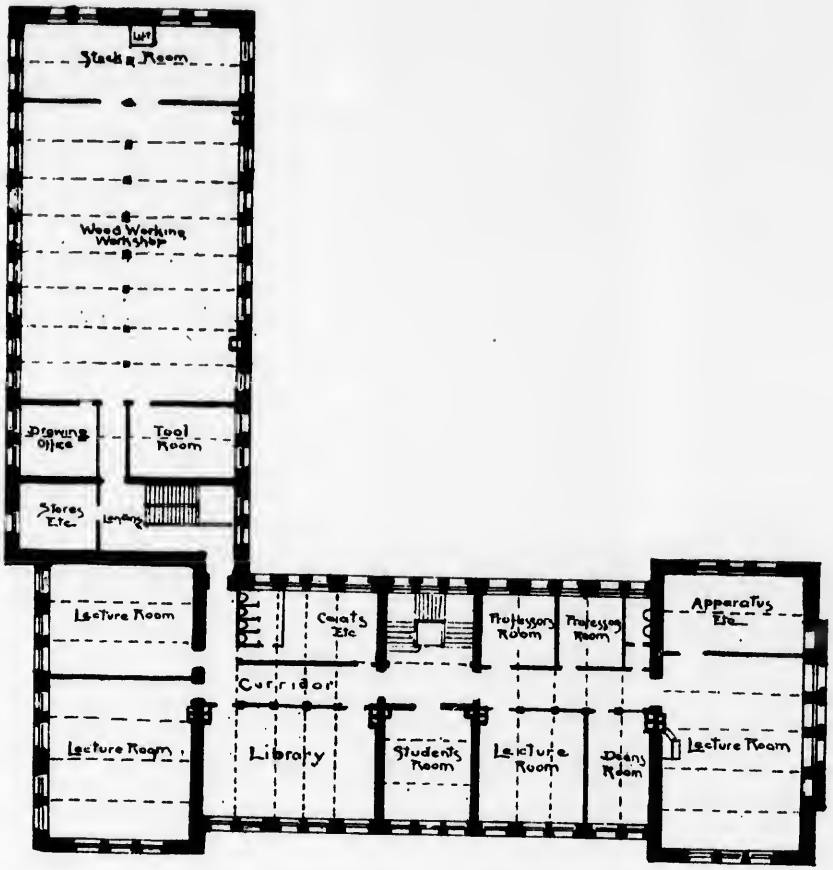

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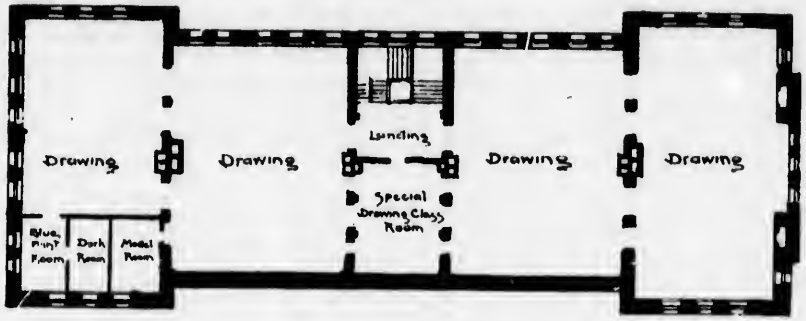

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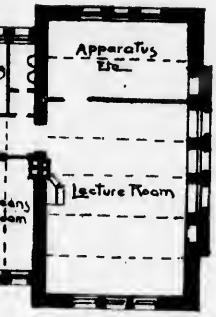

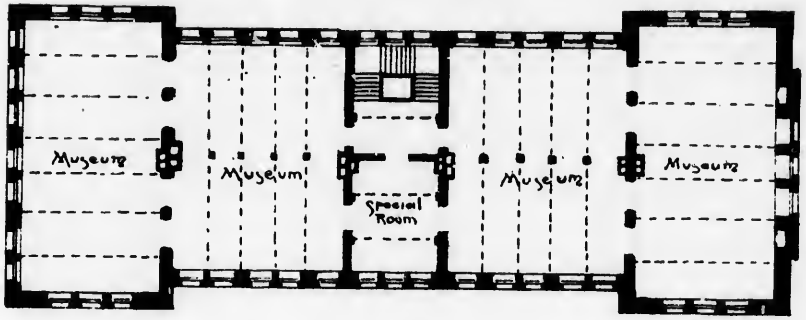

··THIRD·FLOOR·PLAN··

McGILL UNIVERSITY.

FACULTIES OF McGILL COLLEGE.

The Faculty of Arts.—The complete course of study extends over four Sessions, of eight months each, and includes Classics and Mathematics, Experimental Physics, English Literature, Logic, Mental and Moral Science, Natural Science, and one Modern Language or Hebrew. The course of study is, with few exceptions, the same for all students in the first two years; but in the third and fourth years extensive options are allowed, more especially in favour of the Honour Courses in Classics, Mathematics, Mental and Moral Science, Natural Science, English Literature and Modern Languages. Certain exemptions are also allowed to professional Students. The course of study leads to the Degrees of B.A., M.A., and LL.D.

The Degree of B.A. from this University admits the holder to the study of learned professions without preliminary examinations, in the Provinces of Quebec and Ontario, and in Great Britain and Ireland, &c.

The Donalda Special Course in Arts provides for the education of women, in separate classes, with course of study, exemptions and honours, similar to those for men.

The Faculty of Applied Science provides a thorough professional training, extending over three or four years, in Civil Engineering, Mechanical Engineering, Mining Engineering, and Assaying, Practical Chemistry and Electrical Engineering, leading to the Degrees of Bachelor of Applied Science, Master of Engineering, and Master of Applied Science.

The Faculty of Law.—The complete course in Law extends over three Sessions of six months each, and leads to the Degrees of B.C.L., and D.C.L.

The Faculty of Medicine.—The complete course of study in Medicine extends over four Sessions, of six months each, and one Summer Session of three months in the third Academic Year, and leads to the Degree of M.D., C.M.

The Faculty of Comparative Medicine and Veterinary Science.—The complete course extends over three Sessions of six months each, and leads to the Degree of D.V.S.