

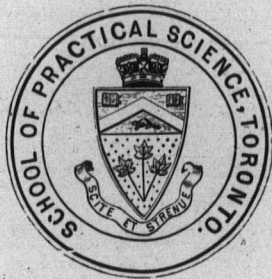
SCHOOL OF PRACTICAL SCIENCE TORONTO.

SC

CALENDAR
OF THE
SCHOOL OF PRACTICAL SCIENCE,
OF THE
PROVINCE OF ONTARIO,
TORONTO.

(AFFILIATED TO THE UNIVERSITY OF TORONTO.)

19th SESSION, 1896-1897.



TORONTO:
PRINTED BY WARWICK BROS. & RUTHER, 68 AND 70 FRONT STREET WEST.
1896.

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1896

SEPTEMBER.							OCTOBER.							NOVEMBER.						
SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.	SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.	SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.
..	..	1	2	3	4	5	..	..	..	..	1	2	3	1	2	3	4	5	6	7
6	7	8	9	10	11	12	4	5	6	7	8	9	10	8	9	10	11	12	13	14
13	14	15	16	17	18	19	11	12	13	14	15	16	17	15	16	17	18	19	20	21
20	21	22	23	24	25	26	18	19	20	21	22	23	24	22	23	24	25	26	27	28
27	28	29	30	..	..	..	25	26	27	28	29	30	31	29	30	..	..	..	..	..

25. Meeting of Council.
 28. Entrance Examinations begin.

1. FIRST TERM begins.
 2. Supplemental Examinations begin.
 9. Meeting of Council.

13. Meeting of Council.

1897

DECEMBER.							JANUARY.							FEBRUARY.						
SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.	SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.	SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.
..	..	1	2	3	4	5	..	..	..	..	..	1	2	..	1	2	3	4	5	6
6	7	8	9	10	11	12	3	4	5	6	7	8	9	7	8	9	10	11	12	13
13	14	15	16	17	18	19	10	11	12	13	14	15	16	14	15	16	17	18	19	20
20	21	22	23	24	25	26	17	18	19	20	21	22	23	21	22	23	24	25	26	27
27	28	29	30	31	..	..	24	25	26	27	28	29	30	28	..	..	..	..	..	..
..	..	..	..	..	..	..	31	..	..	..	..	..	..	..	..	..	..	..	..	..

11. Meeting of Council.
 23. FIRST TERM ends.

8. SECOND TERM begins.
 8. Meeting of Council.

12. Meeting of Council.

MARCH.							APRIL.							MAY.						
SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.	SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.	SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.
..	1	2	3	4	5	6	..	..	..	..	1	2	3	..	..	..	..	..	..	1
7	8	9	10	11	12	13	4	5	6	7	8	9	10	2	3	4	5	6	7	8
14	15	16	17	18	19	20	11	12	13	14	15	16	17	9	10	11	12	13	14	15
21	22	23	24	25	26	27	18	19	20	21	22	23	24	16	17	18	19	20	21	22
28	29	30	31	..	..	..	25	26	27	28	29	30	..	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	31	..	..	..	..	..

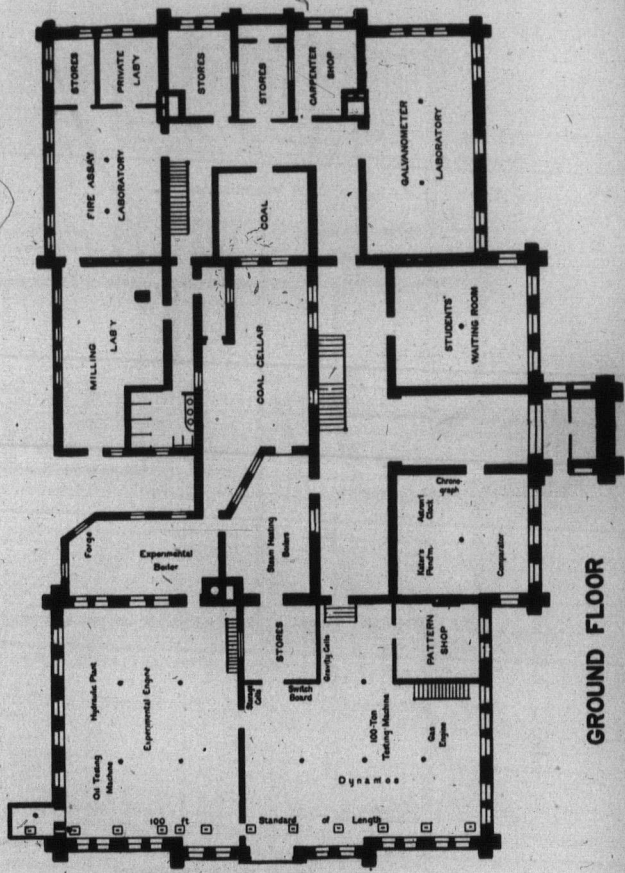
3. Ash-Wednesday. Building closed.
 12. Meeting of Council.

9. Meeting of Council.
 9. Lectures and Practical Work close.
 16. Good-Friday. Bdg. closed
 17. Annual Examinations begin.

1. SECOND TERM ends.
 11. Examinations for B.A.Sc. begin.

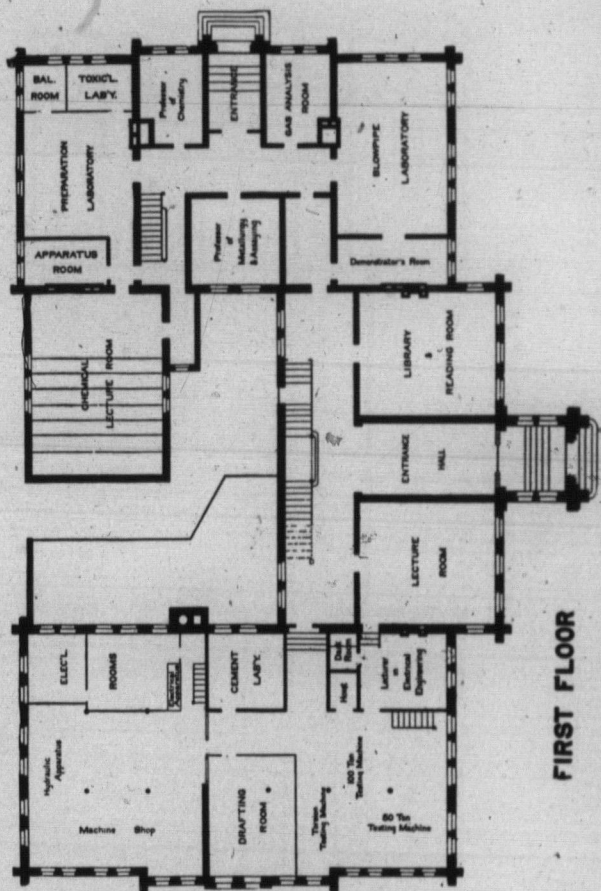
Black figures denote meetings of the Engineering Society.





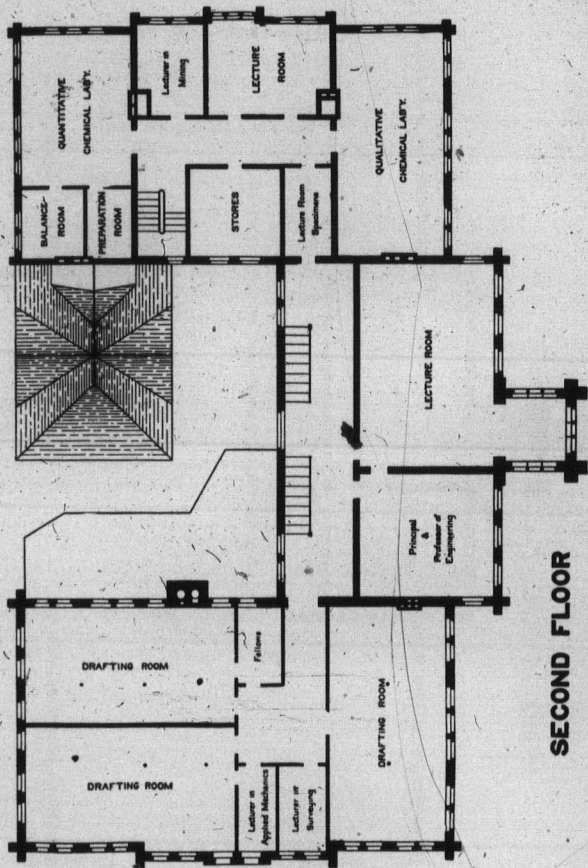
GROUND FLOOR





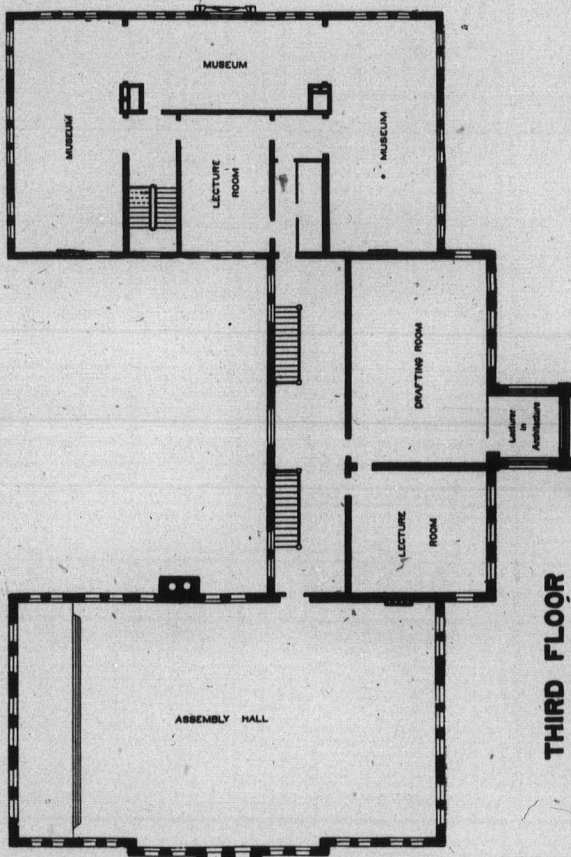
FIRST FLOOR

1912
1913



SECOND FLOOR





THIRD FLOOR

TIME TABLE—FIRST YEAR—SESSION 1896-97.

	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
9-10	* Analytical Geometry, 1, 2, 3, 4 Chemical Lab'y, 5	* Euclid.	* Trigonometry.		* Trigonometry.
10-11	* Electricity & Magnetism, 3, 5 (a) Drawing, 1, 2, 4 do, 3, 5 (b)	Statics, 1, 2, 3, 4 do, 5 (a) Drawing, 5 (b)	* Acoustics, 4 (a) Electricity, 3, 5 (b) do, 3, 5 (a) do, 4 (b)	* Algebra. Statics, 1, 2, 3, 4 do, 5 (a) Drawing, 5 (b)	* Electricity & Magnetism, 3, 5 (a) Electricity, 3, 5 (b) History of Arch'e, 1, 2 Drawing.
11-12	Drawing, 1, 2, 3, 4 Chemical Lab'y, 5	Chemistry.	Chemistry.	Chemistry.	* Pen and Ink Drawing, 4
12-1	Drawing, 1, 2, 3, 4 Chemical Lab'y, 5	Dynamics.	Descriptive Geometry.	Surveying, 1, 2, 3, 4 Drawing, 5	Drawing, 1, 2, 3, 5
1-2					
2-3	Chemical Lab'y.				
3-4	Chemical Lab'y, 3, 5 Drawing, 1, 2, 4	* Physical Lab'y, 3, 5 (a) Field Work, 1, 2, 4 (a) Chemical Lab'y, 5 (b) Drawing, 1, 2, 3, 4 (b)	Chemical Lab'y, 1, 2, 4, 5 Drawing.	* Physical Lab'y, 3, 5 (a) Field Work, 1, 2, 4 (a) Chemical Lab'y, 5 (b) Drawing, 1, 2, 3, 4 (b)	Chemical Lab'y, 5 Field Work, 1, 2, 4 (a) do, 3, 4 (b)
4-5	Chemical Lab'y, 3, 5 Drawing, 1, 2 History of Arch'e, 4	* Physical Lab'y, 3, 5 (a) Field Work, 1, 2, 4 (a) Chemical Lab'y, 5 (b) Drawing, 1, 2, 3, 4 (b)	Chemical Lab'y, 1, 2, 4, 5 Drawing.	* Physical Lab'y, 3, 5 (a) Field Work, 1, 2, 4 (a) Chemical Lab'y, 5 (b) Drawing, 1, 2, 3, 4 (b)	Chemical Lab'y, 5 Field Work, 1, 2, 4 (a) Drawing, 3, 4 (b)

1. Civil Engineering; 2. Mining Engineering; 3. Mechanical and Electrical Engineering; 4. Architecture; 5. Analytical and Applied Chemistry. *University of Toronto. (a) First Term. (b) Second Term. Subjects not numbered are common to all the departments. In the department of Analytical and Applied Chemistry all hours not otherwise allotted are to be spent in the laboratories.

TIME TABLE—SECOND YEAR—SESSION 1896-97.

	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	
9-10	Rigid Dynamics, 1, 2, 3 History of Arch ⁶ , 4	Surveying (Lev.), 2, 4 Electricity, 3	* Calculus, 1, 2, 3, 4	* Astronomy, Lithology, Electricity Drawing, 4	* Calculus, 1, 2, 3, 4	9-10
10-11	* Optics, Spherical Trig ⁵ , 1, 2, 3 Drawing, 4 (a) Inorganic Chem ⁵ , 5 Strength of Mate- rials, 1, 2, 3, 4	* Hydrostatics, Metallurgy, 5 Chemical Lab ⁵ , Drawing, 5	Descriptive Geo., 1, 2, 3, 4	* Hydrostatics, Metallurgy, Drawing, 5 (b)	* Optics, Spherical Trig ⁵ , 1, 2, 3 (a) Inorganic Chem ⁵ , 5 Strength of Mate- rials, 1, 2, 3	(b) 10-11
11-12	* Mechanics and Theory of Mech ⁵ , 3 Strength of Mate- rials, 1, 2, 3, 4	Mineralogy and Geology, 1, 2, 4, 5 Theory of Mech ⁵ , 3 Strength of Mate- rials, 1, 2, 3, 4	Mineralogy and Geology, 1, 2, 4, 5 Theory of Mech ⁵ , 3 Strength of Mate- rials, 1, 2, 3, 4	Drawing, 1, 2, 3 Electrical Lab ⁵ , Drawing, 1, 2, 3	* Inorganic Chem ⁵ , Pois and Ink, Drawing, 1, 2, 3 Drawing, 1, 2, 3, 4	11-12
12-1	Mineralogy and Theory of Mech ⁵ , 3	Chemical Lab ⁵ , Drawing, 5	Strength of Mate- rials, 1, 2, 3, 4	Drawing, 1, 2, 3 Electrical Lab ⁵ , Drawing, 1, 2, 3	Drawing, 1, 2, 3, 4	12-1
1-2	Mineralogical Lab ⁵ , 1, 2 Electrical Lab ⁵ , 3 Drawing, 4	Applied Chemistry.	* Physical Lab ⁵ , Orders of Arch ⁶ Drawing, 1, 2	Applied Chemistry.		1-2
2-3	Mineralogical Lab ⁵ , 1, 2 Electrical Lab ⁵ , 3 Drawing, 4	Applied Chemistry.	* Physical Lab ⁵ , Orders of Arch ⁶ Drawing, 1, 2	Applied Chemistry.	* Physical Lab ⁵ , Chemical Lab ⁵ , Field Work, Drawing, 1, 2, 4 (a)	2-3
3-4	Mineralogical Lab ⁵ , 1, 2 Electrical Lab ⁵ , 3 Drawing, 4	* Physical Lab ⁵ , 1, 2, 4 (b) Mineralogical Lab ⁵ , Field Work, 1, 2, 4 (a) Drawing, 3	* Physical Lab ⁵ , Drawing, 1, 2, 3 (b) do do do	* Physical Lab ⁵ , 1, 2, 4 (b) Mineralogical Lab ⁵ , Field Work, 1, 2, 4 (a) Drawing, 3	* Physical Lab ⁵ , 3, 5 (b) Chemical Lab ⁵ , Field Work, Drawing, 1, 2, 4 (a)	3-4
4-5	Mineralogical Lab ⁵ , 1, 2 Electrical Lab ⁵ , 3 Drawing, 4	* Physical Lab ⁵ , 1, 2, 4 (b) Mineralogical Lab ⁵ , 5 Field Work, 1, 2, 3 (b) Drawing, 3	* Physical Lab ⁵ , Drawing, 1, 2, 3 (b) do do do	* Physical Lab ⁵ , 1, 2, 4 (b) Mineralogical Lab ⁵ , 5 Field Work, 1, 2, 3 (b) Drawing, 3	* Physical Lab ⁵ , 3, 5 (b) Chemical Lab ⁵ , Field Work, Drawing, 1, 2, 4 (a) History of Ornament, 4	4-5

1, Civil Engineering; 2, Mining Engineering; 3, Mechanical and Electrical Engineering; 4, Architecture; 5, Analytical and Applied Chemistry. *University of Toronto. (a) First Term. (b) Second Term. Subjects not numbered are common to all the departments. In the department of Analytical and Applied Chemistry all hours not otherwise allotted are to be spent in the laboratories.

TIME TABLE—THIRD YEAR—SESSION 1896-97.

MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.

TIME TABLE—THIRD YEAR—SESSION 1896-97.

	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
9-10	Biology, Thermodynamics, 1, 2, 3 Drawing	Hydraulics, 1, 2, 3, 4	Biology, Zoology, 1, 2, 3, 4 History of Arch ^o	Hydraulics, 1, 2, 3, 4	Biology, and Strees, 1, 2, 3, 4 Mining and Ore Dressing, 1, 2, 3, 4
10-11	Drawing, 1, 2, 3, 4	Astronomy and Geodesy, Machine Design, 4 Drawing Ore Deposits, Chemical Lab'y	Mineralogy Lab'y Assaying do do	Astronomy and Geodesy, Machine Design, 4 Drawing Ore Deposits, Chemical Lab'y,	Drawing, 1, 2, 3, 4
11-12	Drawing, History of Arch ^o , 4	Constructive Design, Drawing Chemical Lab'y	Mineralogical Assaying do do do	Constructive Design, Drawing Chemical Lab'y	Drawing, 1, 2, 3, 4 Mechanics of Machinery, 3
12-1	Applied Chemistry.	Mineralogy and Geology, 1, 2, 4, 3 Drawing.	Mineral Lab'y, 1, 2, 5 Assaying Principles of Decri ⁿ , Drawing, do	Mineralogy and Geology, 1, 2, 4, 3 Electricity.	Applied Chemistry.
1-2					
2-3	Physical Lab'y, 3, 5 Drawing, 1, 2, 3 Metallurgy, Pumping, Heating, and Ventilation, 4	Field Work, 1, 2, 4 Physical Lab'y, 2, 3, 5 Drawing, 1, 4 do	Descriptive Chemistry, Theory of Least Squares, Chemistry, do do do do	Practical Biology, Electrical Lab'y, Metallurgy, Drawing.	Physical Lab'y, 3, 5 Field Work, 1, 2, 3 Chemical Lab'y, Drawing
3-4	Physical Lab'y, Organic Chemistry, Drawing, do	Organic Chemistry, 5 Field Work, 1, 2, 3 Physical Lab'y, 2, 3 Assaying, Drawing.	Drawing, Chemistry Pen and Ink, do	Practical Biology, 5 Electrical Lab'y, 2, 3 Assaying, Drawing.	Physical Lab'y, 3, 5 Chemical Lab'y, Field Work, Drawing.
4-5	Physical Lab'y, Spectroscopy (lect), Drawing.	Field Work, Electrical Lab'y, Assaying, Drawing.	Drawing, Chemistry, do	Field Work, Electrical Lab'y, Assaying, Drawing.	Physical Lab'y, 3, 4 Chemical Lab'y, 1, 2, 3 Field Work, 1, 2, 4 Drawing, 2, 3

1. Civil Engineering; 2. Mining Engineering; 3. Mechanical and Electrical Engineering; 4. Architecture; 5. Analytical and Applied Chemistry. University of Toronto. (a) First Term. (b) Second Term. Subjects not numbered are common to all the departments. In the department of Analytical and Applied Chemistry all hours not otherwise allotted are to be spent in the laboratories.

TIME TABLE—FOURTH OR POST-GRADUATE YEAR.

There is no regular time table for the work of this year. The time of the students is spent almost wholly in the engineering, chemical, and assaying laboratories. The hours are from 9 a.m. to 9 p.m. every working day during the session. Lectures are given at such intervals as suit the laboratory work.

FACULTY OF THE SCHOOL.

—

J. GALBRAITH, M.A., M. CAN. SOC. C.E., PRINCIPAL.

—

MEMBERS OF THE COUNCIL.

J. GALBRAITH, M.A., M. CAN. SOC. C.E. *Professor of Engineering (Chairman).*
 W. HODGSON ELLIS, M.A., M.B. *Professor of Applied Chemistry.*
 A. P. COLEMAN, M.A., PH.D. *Professor of Assaying and Metallurgy.*
 L. B. STEWART, F.L.S., D.T.S. *Lecturer in Surveying (Secretary).*
 C. H. C. WRIGHT, B.A.Sc. *Lecturer in Architecture.*
 T. R. ROSEBRUGH, M.A., GRAD. S.P.S. *Lecturer in Electrical Engineering.*
 J. A. DUFF, B.A., GRAD. S.P.S. *Lecturer in Applied Mechanics.*
 G. R. MICKLE, B.A., GRAD. S.P.S. *Lecturer in Mining.*

—

ASSISTANT INSTRUCTORS.

W. E. BOUSTEAD, B.A.Sc. *Acting Demonstrator in Metallurgy
and Assaying.*
 J. KEELE, B.A.Sc. *Fellow in Civil Engineering.*
 W. MINTY, B.A.Sc. *Fellow in Mechanical Engineering.*
 A. T. LAING, B.A.Sc. *Fellow in Surveying.*
 A. E. BLACKWOOD, GRAD. S.P.S. *Fellow in Electrical Engineering.*
 W. LAWSON, B.A.Sc. *Fellow in Analytical and Applied
Chemistry.*

—

MEMBERS OF THE FACULTY OF THE UNIVERSITY OF TORONTO WHOSE CLASSES ARE ATTENDED BY THE REGULAR STUDENTS OF THE SCHOOL.

JAMES LOUDON, M.A., LL.D. *President and Professor of Physics.*
 R. RAMSAY WRIGHT, M.A., B.Sc. *Professor of Biology.*
 W. H. PIKE, M.A., PH.D. *Professor of Chemistry.*
 ALFRED BAKER, M.A. *Professor of Mathematics.*
 A. B. MACALLUM, B.A., M.B., PH.D. *Professor of Physiology.*
 W. J. LOUDON, B.A. *Demonstrator in Physics.*
 C. A. CHANT, B.A. *Lecturer in Physics.*
 J. C. McLENNAN, B.A. *Assistant Demonstrator in Physics.*
 ALFRED T. DELURY, B.A. *Lecturer in Mathematics.*
 W. L. MILLER, B.A., PH.D. *Demonstrator in Chemistry.*
 W. J. RUSK, B.A. *Fellow in Mathematics.*

For information further than that contained in the Calendar, applications may be made to the Secretary, L. B. STEWART.

SCHOOL OF PRACTICAL SCIENCE

PROVINCE OF ONTARIO.

CALENDAR FOR THE SESSION 1896-7.

In the Session of 1877 the Legislative Assembly gave its sanction to the establishment of a School of Practical Science on the basis proposed in the memorandum of the Minister of Education confirmed by the Lieutenant-Governor in Council on the 8rd day of February, 1877.

By the scheme thus approved of, the Government effected an arrangement with the Council of University College whereby the students of the School of Practical Science enjoyed full advantage of the instruction given by its professors and lecturers in all the departments of science which were embraced in the work of the School.

This arrangement was brought to an end in 1889 by the transfer of the departments in science above referred to, from University College to the University of Toronto under the operation of the University Federation Act.

In order that the students of the School might continue to enjoy the advantage of the instruction in the above departments, the Senate of the University of Toronto passed a Statute in October, 1889, affiliating the School to the University, which Statute was confirmed by the Lieutenant-Governor in Council on the 30th day of October, 1889.

By an Order-in-Council, approved by the Lieutenant-Governor, on the 6th day of November, 1889, a Principal was appointed, and the management of the School was entrusted to a council composed of the Principal as chairman, and the Professors, Lecturers and Demonstrators appointed on the Teaching Faculty of the School.

There are five regular Departments of Instruction, in each of which Diplomas are granted, viz. :—

1. Civil Engineering (including Sanitary Engineering).
2. Mining Engineering.
3. Mechanical and Electrical Engineering.
4. Architecture.
5. Analytical and Applied Chemistry.

The instruction given in each of these departments is designed to give the student a thorough knowledge of the scientific principles underlying the practice in the several professions, and also such a training as may make him immediately useful when he enters into active professional work.

DIPLOMA.

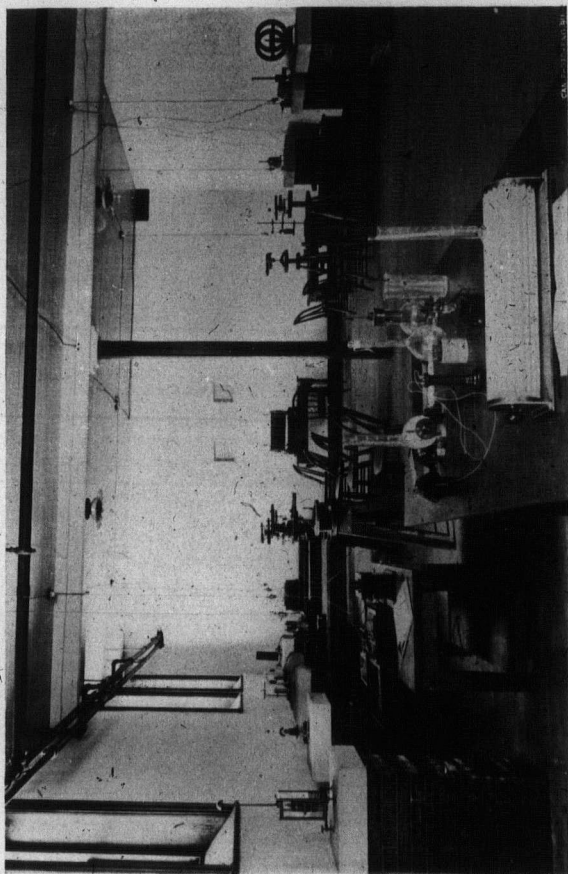
The regular course in each department is of three years' duration, and leads to the Diploma of the School. The instruction is given partly in the lecture rooms and partly in the drafting rooms, laboratories and field. A certain amount of work is laid out for the long vacation. The course of study in each department is general, and beyond the selection of his department the student has no opportunity to specialize.

DEGREE OF B. A. SC.

After the general course is finished the Diploma of the School is granted, and the student is at liberty either to enter the active life of his profession or to spend another year in special work. This year is called the fourth, or post-graduate, year. Students electing to proceed with their studies are allowed to select two subjects from an approved list, and are required to confine their whole attention to these subjects during the fourth year. The subjects on this list are such as require a large amount of time to be devoted to laboratory and other practical work. The advanced theoretical instruction is given either at the beginning or end of the working-day, in order not to break up the time allotted to practical work. During this year the student is required to prepare a Thesis on some subject connected with his work. The practical examinations are held by the School, while the written examinations and the examination of the Theses are held by the University. After complying with all requirements, the candidate receives from the University the degree of Bachelor of Applied Science (B. A. Sc.).

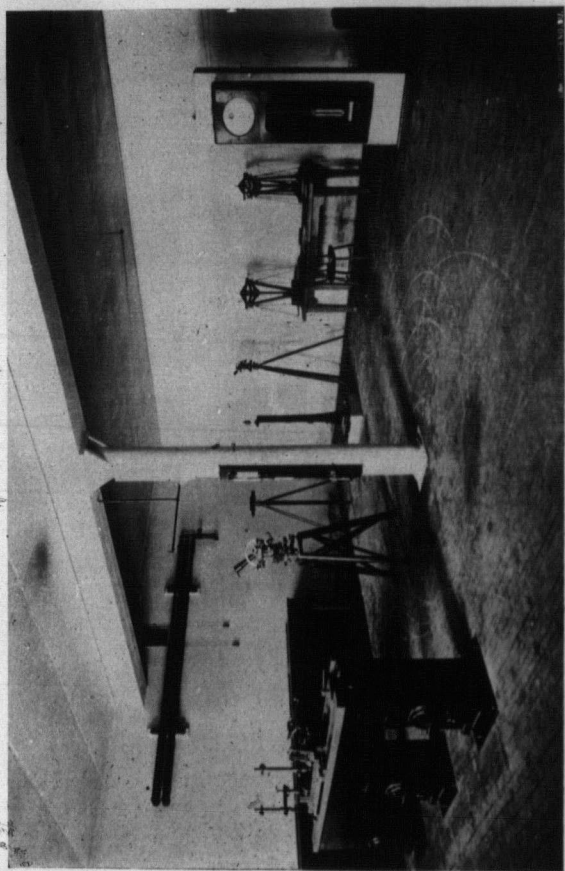
PROFESSIONAL DEGREES.

Bachelors of Applied Science may, after three years spent in professional work, present themselves for the degrees of Civil Engineer (C. E.), Mining Engineer (M. E.), Mechanical Engineer (M. E.), or Electrical Engineer (E. E.), as the case may be, subject to the rules and regulations established by the University.



GALVANOMETER LABORATORY.





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REGULATIONS
RESPECTING THE
SCHOOL OF PRACTICAL SCIENCE.

*Approved by His Honor the Lieutenant-Governor in Council
the 3rd day of April, 1894.*

1. The internal management and discipline of the School of Practical Science shall be vested in a Council (of which the Principal shall be chairman) consisting of the Professors, Lecturers and Demonstrators appointed by the Lieutenant-Governor in Council on the staff of the School.
2. The Academic Year shall consist of two Terms, the First Term extending from 1st October to 23rd December, and the Second Term from 8th January to 1st May.
3. A Diploma shall be granted to each student who shall have completed to the satisfaction of the Council the Regular Course in any of the following five Departments:
 - (1) Civil Engineering (including Sanitary Engineering).
 - (2) Mining Engineering.
 - (3) Mechanical and Electrical Engineering.
 - (4) Architecture.
 - (5) Analytical and Applied Chemistry.
4. The Regular Course for the Diploma of the School in each Department shall be three years.
5. Students may enter the Regular Course in any one of the above Departments either (a) by presenting certificates of having passed the Matriculation Examination in any University in Her Majesty's Dominions, or in all the subjects of such Matriculation Examina-

tion except Greek and Latin, or the High School Leaving Examination of the Province of Ontario, or (b) by presenting certificates of having had at least one year's experience in some recognized engineering, architectural or manufacturing work or business, and passing an examination in the following subjects :

Arithmetic.—Fundamental rules, metric system, fractions, decimals, powers, square root, mensuration, percentage, interest.

Algebra.—Elementary rules, easy factoring, highest common measure, lowest common multiple, square root, fractions, ratio, simple equations of one, two or three unknown quantities, indices, surds, quadratic equations of one or two unknown quantities.

Euclid.—Books I., II., and III. ; deductions.

English.—Dictation, composition.

6. The Council shall have the power of dealing with special cases, provided the candidates are sufficiently prepared to take their places in the classes.
7. Special students may be permitted to attend such lectures or courses of instruction, or of practical work, as the Council may think proper.
8. Certificates of attendance and standing may be given upon due examination to special students, and such students shall not be required to pass an entrance examination.
9. At the end of the Academic Year examinations will be held in the different subjects taught. Candidates for Diplomas and Certificates are required to enter for these.
10. All regular students shall be in attendance at the school during the whole of each term, unless exempted by special permission of the Council. The term will not be allowed to any student who has attended less than three-fourths of the required lectures and practical lessons, or who has been reported to the Council for bad conduct and adjudged guilty thereof.
11. Students of the School shall attend such courses of lectures at the University of Toronto as may be required of them by the Council

ADMISSION.

The conditions of admission for regular and special students are stated in clauses 5, 6, 7 and 8 of the order in Council, pp. 25 and 26.

For information regarding the conditions for Matriculation in the Universities, application must be made to the Registrars of these Institutions.

Information respecting the High School Leaving Examination may be obtained from the Education Department, Toronto, or from any Principal of a High School or Collegiate Institute.

Students intending to write at the High School Leaving Examination for the purpose of entering the School of Practical Science may do so without having previously passed the Primary Examination. Their papers must be endorsed "For admission to School of Practical Science."

The only examination held in the School of Practical Science for the purpose of testing qualifications for admission is that mentioned in clause 5 (b) order in Council, p. 26.

This examination will begin at 9 a.m. Monday, September 28th, 1896.

Candidates are required to give the Secretary at least two weeks' notice in writing of their intention to take this examination.

FORM OF DIPLOMA

THE
SCHOOL OF PRACTICAL SCIENCE
PROVINCE OF ONTARIO.

(ESTABLISHED 1878.)

THIS IS TO CERTIFY that

.....
of the..... in the.....
..... has completed the Regular Course
of this School for the Diploma in the
extending over a period of three years, and comprising theoretical and practical
instruction in the following subjects, viz. :
.....
.....

WHEREFORE the said.....
becomes duly entitled to receive this Diploma, having fulfilled to the satisfaction
of the Faculty of the School all the requirements thereunto relating.

IN WITNESS whereof we have signed this Diploma at Toronto, in the Pro-
vince of Ontario, this..... day of.....
..... One thousand eight hundred and.....
and have caused the seal of this School to be hereinto affixed.

[L.S.]

.....Chairman.
.....Secretary.

REGULAR COURSES FOR THE DIPLOMA.

See regulations, pp. 25 and 26.

The following are the Departments in which the Diploma is granted :—

- (1) Civil Engineering (including Sanitary Engineering).
- (2) Mining Engineering.
- (3) Mechanical and Electrical Engineering.
- (4) Architecture.
- (5) Analytical and Applied Chemistry.

SESSIONAL FEES, DUES AND DEPOSITS.

These are payable in two instalments, one in each term.

A discount of two dollars will be made on each instalment if paid before the end of the first calendar month of the term in which it is due.

The following table shows the amounts payable in the Regular Courses :

Year.	Description of Payment.	1.	2.	3.	4.	5.
		Civil Engineering.	Mining Engineering.	Mechanical and Electrical Engineering.	Architecture.	Analytical and Applied Chemistry.
		\$ c.	\$ c.	\$ c.	\$ c.	c.
I.	Payable in First Term—					
	Sessional Fees	22 00	22 00	22 00	22 00	22 00
	Dues—					
	Physical Laboratory			1 00		1 00
	Library	1 00	1 00	1 00	1 00	1 00
	Deposits—					
	General	2 00	2 00	2 00	2 00	2 00
	Chemical Laboratory	3 00	3 00	3 00	3 00	3 00
	Mineralogical Laboratory					
			28 00	28 00	29 00	28 00	29 00
Payable in Second Term—						
Sessional Fees	22 00	22 00	22 00	22 00	22 00	
Total	50 00	50 00	51 00	50 00	51 00	

SESSIONAL FEES, DUES AND DEPOSITS.—*Concluded.*

Year.	Description of Payment.	1.	2.	3.	4.	5.
		Civil Engineering.	Mining Engineering.	Mechanical and Electrical Engineering.	Architecture.	Analytical and Applied Chemistry.
II.	Payable in First Term—	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
	Sessional Fees	27 00	27 00	27 00	27 00	27 00
	Dues—					
	Physical Laboratory	1 50	1 50	1 50	1 00	1 50
	Library	1 00	1 00	1 00	1 00	1 00
	Deposits—					
	General	2 00	2 00	2 00	2 00	2 00
	Chemical Laboratory ...	3 00	3 00	3 00	3 00	3 00
	Mineralogical Laboratory	3 00	3 00	.....	.....	3 00
		37 50	37 50	34 50	34 00	37 50
	Payable in Second Term—					
	Sessional Fees	27 00	27 00	27 00	27 00	27 00
Total	64 50	61 50	61 50	61 00	64 50	
III.	Payable in First Term—					
	Sessional Fees	32 00	32 00	32 00	32 00	32 00
	Dues—					
	Physical Laboratory	1 00	.....	3 00	2 00	3 00
	Library	1 00	1 00	1 00	1 00	1 00
	Deposits—					
	General	2 00	2 00	2 00	2 00	2 00
	Chemical Laboratory ...	3 00	.....	.....	.....	3 00
	Mineralogical Laboratory	3 00	3 00	.....	.....	.....
		39 00	38 00	38 00	37 00	41 00
	Payable in Second Term—					
	Sessional Fees	32 00	32 00	32 00	32 00	32 00
Total	71 00	70 00	70 00	69 00	73 00	

The total expense of a regular three years' course in any department is about \$280, which amount includes books, instruments and materials as well as the fees, etc., stated in above table.

Fourth or Post-Graduate Year.—The fees, etc., in this year are as follows:

<i>Payable in First Term—</i>	
Sessional Fees	\$30 00
Dues, Library	1 00
Deposits, General	2 00
<i>Payable in Second Term—</i>	
Sessional Fees	29 00
Total	<u>\$62 00</u>

Special Students.—The fees payable by special students depend upon the nature and amount of work taken. All special students are required to pay the library fee, \$1, the general deposit, \$2, and the deposits and dues of the laboratories in which they work.

Information as to the text-books, instruments and materials to be purchased by the students will be given on registration at the beginning of the session.

Special Certificates.—Certificates will be granted to special students only in cases in which application has been made to the Council at the beginning of the session and conditions of award arranged.

FELLOWSHIPS.

The following fellowships have been established, open to graduates of the school: Civil Engineering, Mechanical Engineering, Electrical Engineering, Surveying, Analytical and Applied Chemistry.

Each fellowship is of the value of \$500 per annum.

The Fellows are required to take such portions of the work of instruction as may be assigned to them by the Council.

Applications for these fellowships are to be made annually to the Secretary on or before the 20th day of September.

REGULATIONS RESPECTING EXAMINATIONS.

Candidates are required to send to the Secretary at least three weeks before the commencement of the Annual Examinations in April, and the Supplemental Examinations in October, notice in writing of their intention to take such examinations.

This regulation applies to all regular students and to such special students as may be candidates for certificates.

No candidate will be allowed his examination who has not paid all fees and dues for which he is liable.

The minimum percentage of marks required to pass in the written examinations will be fixed from time to time by the Council.

The minimum percentage of marks required to pass in the practical work connected with any subject shall be one and one-half times the minimum required in the case of a written examination.

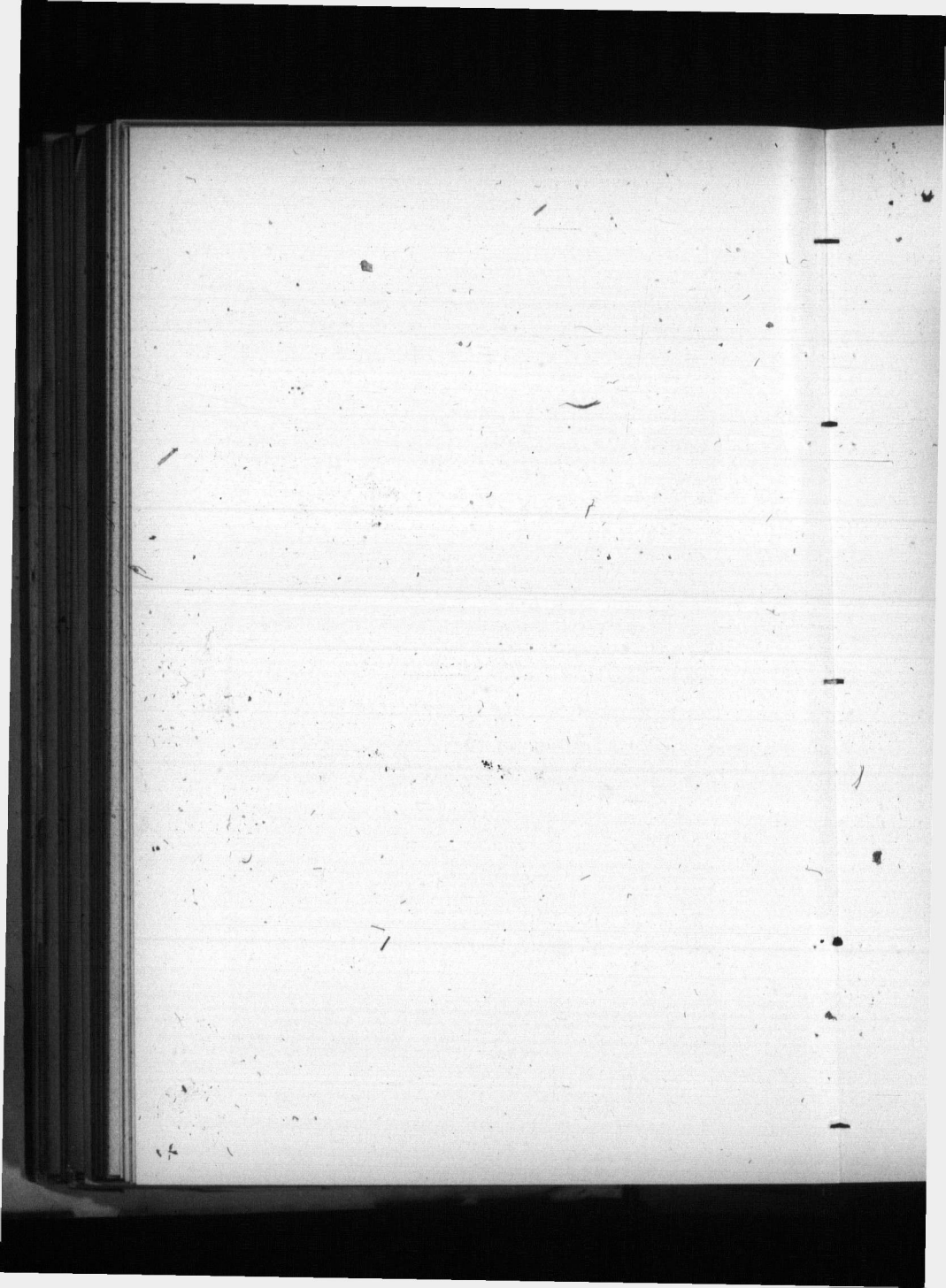
In order to pass in subjects wherein both written and practical examinations are held, the candidate must pass in each examination.

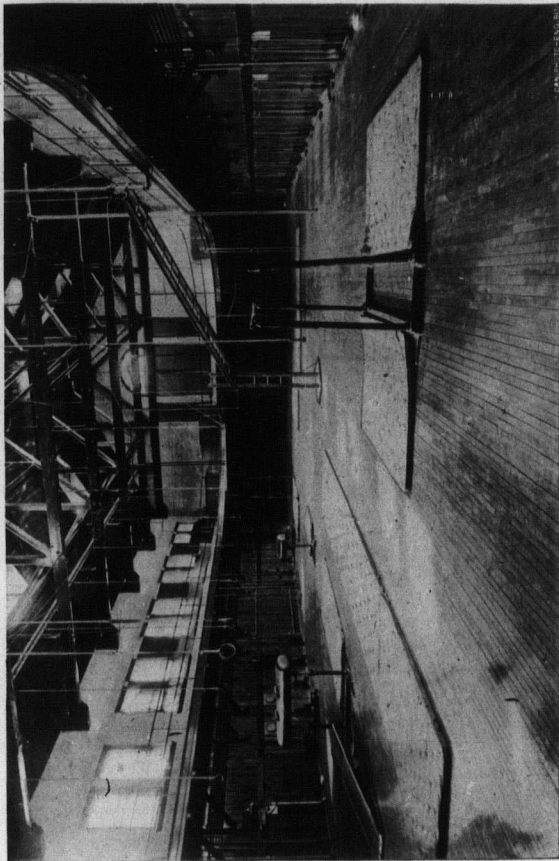
In order to pass the practical examinations in the subjects of Applied Mechanics, Descriptive Geometry, Surveying and Architecture, the following minimum number of drawings must be made in the respective Years and Departments :

Department.	Year.	Applied Mechanics.	Descriptive Geometry.	Surveying.	Architecture.
Civil Engineering	I.	8	7	6	.....
	II.	8	12	4	.....
	III.	8	11	4	.....
Mining Engineering	I.	8	7	6	.....
	II.	5	9	4	.....
	III.	4	8	4	.....
Mechanical and Electrical Engineering	I.	8	7	7	.....
	II.	12	7	7	.....
	III.	12	10	.....	.....
Architecture	I.	8	7	2	7
	II.	5	9	.....	9
	III.	6	8	10
Analytical and Applied Chemistry ..	I.	4	7



ARCHITECTURAL LECTURE ROOM.





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The above number of drawings will include only such as shall be specially prescribed for the purpose.

These drawings will be prescribed as the work of the session proceeds.

Drawings prescribed for the first term of the session will not be counted unless finished in that term.

To pass in Drawing the drawings referred to in the preceding table must be made, together with as many others as may be prescribed.

The number of practice sheets to be made by each student will depend upon his progress.

The minimum number of drawings shall be twenty-five and the maximum number thirty-five, except in the Department of Analytical and Applied Chemistry, in which the numbers shall be fifteen and twenty-five respectively.

The minimum percentage of marks prescribed for practical work must be obtained in Drawing.

The drawings must be made on paper 15 x 22 inches, unless otherwise prescribed.

At the end of each term the drawings must be neatly bound together between covers of approved pattern before they are finally examined, and the student's name, together with his year, term and date, neatly printed on said cover.

The Council reserve the right of disposing of the drawings as they may think proper. No drawing may be removed from the School without permission.

To pass in Surveying the minimum percentage required for practical work must be obtained in the field work.

No drawings will be counted which have not been made in the drafting rooms, and during the hours allotted to such work.

No field notes will be counted which have not been taken in the field, and during the hours allotted to such work.

The penalties for the infringement of the above two rules will be determined in each case by the Council.

VACATION WORK.

Vacation work must be handed in on or before October 5th, otherwise it will not be counted.

Vacation notes must be on construction only, and consist of not less than twenty, nor more than thirty pages. The sketches must be free-hand pencil drawings with figured dimensions.

Theses must be written on ordinary foolscap, and consist of not less than twenty, nor more than thirty pages.

The minimum percentage of marks required for practical work must be made in the case of vacation notes and theses.

No notes, whether taken during the session or the vacation, will be counted unless made in the standard note books of the School.

Theses must be accompanied by carefully made drawings and illustrations, separated from the text, and be bound between flat covers.

The sketches for the second year thesis in the Architectural Course are to be made on one side of the sheet of a sketch book and mounted on cardboard or paper 15 x 22 inches.

The Architectural students are advised to spend the vacation in architects' offices.

SUPPLEMENTAL EXAMINATIONS, ETC.

A candidate below the standing of the third year, who has failed in one or two subjects, will be required to take supplemental examinations in such subjects.

In case a candidate has failed in both the written examinations and the practical work in a subject, it will be necessary for him to obtain the minimum percentage required for practical work in the written examination, and to do such extra practical work during the ensuing session as may be prescribed.

Should his failure have been in only the practical work of a subject, he will be required to take a supplemental written examination, and to do such extra practical work during the ensuing session as may be prescribed. If his failure has been in the written examination only, he will be required to take a written supplemental examination. In each of these cases the minimum percentage required for a written examination will be exacted.

The supplemental written examinations in subjects taught by the staff of the school will begin on the second day of the session. In other subjects they will be held at the time of the annual examinations.

In the case where a candidate fails to pass a supplemental examination it will count as one of the two supplemental examinations which may be allowed him after the next annual examination.

Candidates of the standing of the third year will not be allowed the privilege of a supplemental examination.

Candidates who fail in being promoted to a higher year or in graduating will be required to take again the whole course of instruction, both theoretical and practical, of the year in which they failed, before presenting themselves a second time for examination.

No candidate will be allowed his examination if his written answers or thesis indicate ignorance of the ordinary rules of spelling and composition.

The fees to be paid by a student repeating a year will be the regular fees for such year.

Students are required to spend the hours of every working day between 9 a.m. and 5 p.m. at the work laid down in the time table.

No exemption from any of the foregoing regulations will be granted, unless under such exceptional circumstances as may be deemed sufficient by the Council, which must be fully set forth in a formal petition.

PRIZES.

Through the liberality of Mr. D. B. Dick, Architect, Toronto, a prize of \$10 in books will be open annually for competition in the first year of the Architectural Department.

HONORS.

Honors will be granted in each department to students who pass in all the subjects and obtain at least 66 per cent. of the total number of marks allotted to the department at the annual examinations.

Papers read before the Engineering Society will be considered in granting Honors.

The Honor list will be arranged alphabetically.

REGULAR EXAMINATIONS.

(Approximate List.)

I. YEAR.

Examinations held at end of session.

Algebra.	Statics.
Euclid.	Dynamics.
Plane Trigonometry.	Descriptive Geometry.
Analytical Geometry...1, 2, 3, 4.	Surveying .....1, 2, 3, 4.
History of Architecture.....4.	Chemistry, Elementary.
Magnetism and Electricity...3, 5.	Electricity .....3, 5.
Acoustics.....4.	

Examinations held during the session.

Drawings.
Field Notes .....1, 2, 4.
Construction Notes.....1, 2, 3, 4.
Architectural Sketches .....4.
Experimental Physics.....3, 5.
Practical Chemistry.
French and German.....5.

II. YEAR.

Examinations held at end of session.

Calculus .....1, 2, 3, 4.	Strength of Materials...1, 2, 3, 4.
Astronomy .....1.	Rigid Dynamics .....1, 2, 3.
Optics.	Theory of Mechanism.....3.
Hydrostatics.	Descriptive Geometry...1, 2, 3, 4.
Heat .....5.	Surveying .....1, 2, 4.
History of Architecture.....4.	Spherical Trigonometry...1, 2, 3.
Orders of Architecture .....4.	Mineralogy and Geology. 1, 2, 4, 5.
History of Ornament.....4.	Lithology .....2.
Chemistry, Inorganic & Physical, 5.	Electricity .....3, 5.
Chemistry, Applied.	Metallurgy.

1. Civil Engineering.

3. Mechanical and Electrical Engineering.

2. Mining Engineering.

4. Architecture.

5. Analytical and Applied Chemistry.

Examinations held during the session.

Drawing	1, 2, 3, 4.
Field Notes.....	1, 2.
Construction Notes	1, 2, 3, 4.
Architectural Sketches	4.
Experimental Physics.	
Electricity, Practical	3.
Thesis (at beginning of session).	
Chemistry, Practical.	
Mineralogy, Practical.....	1, 2, 5.
French and German.....	5.

III. YEAR.

Examinations held at end of session.

Magnetism and Electricity...3, 5.	Theory of Construction..1, 2, 3, 4.	
History of Architecture.....4.	Mechanics of Machinery	3.
History of Ornament.....4.	Machine Design.....	3.
Principles of Decoration.....4.	Hydraulics.....	1, 2, 3, 4.
Method of Least Squares...1, 3.	Thermodynamics.....	1, 2, 3.
Chemistry, Inorganic & Organic, 5.	Descriptive Geometry...1, 2, 3, 4.	
Chemistry, Applied.	Practical Astronomy & Geodesy, 1.	
Mineralogy and Geology, 1, 2, 4, 5.	Surveying and Levelling...1, 2, 4.	
Sanitary Plumbing, Heating and Ventilation	Metallurgy.....	2, 3, 5.
Theory of Compound Stress, 1, 3, 4.	Mining and Ore Dressing.....	2.
	Ore Deposits	2.

Examinations held during the session.

Drawings	1, 2, 3, 4.
Field Notes.....	1, 2.
Construction Notes.....	1, 2, 3, 4.
Architectural Sketches	4.
Experimental Physics...1, 3, 4, 5.	
Electricity, Practical	3.
Thesis (at beginning of session).	
Chemistry, Practical	2, 5.
Mineralogy, Determinative. 1, 2, 5.	
Assaying.....	2, 5.

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|------------------------|---|
| 1. Civil Engineering. | 3. Mechanical and Electrical Engineering. |
| 2. Mining Engineering. | 4. Architecture. |
| | 5. Analytical and Applied Chemistry. |

I. DEPARTMENT OF CIVIL ENGINEERING.

(Including Sanitary Engineering.)

This Department is intended to afford the necessary preliminary preparation to students intending to become Civil Engineers (including under this term Sanitary Engineers).

I. YEAR.

MATHEMATICS.

Euclid, Algebra, Plane Trigonometry.
Analytical Plane Geometry.

DRAWING.

Copying from the flat. Lettering. Topography.
Graphics.
Descriptive Geometry in its application to plane-sided solids,
Orthographic (including Isometric) and Oblique Projection.
Original Surveys.

CHEMISTRY.

Elementary Chemistry, with Laboratory Practice.

MECHANICS.

Statics and Dynamics (with special reference to structures and machines).

SURVEYING.

Field and Office Work—Chain and Compass Surveys—Topography
—Preliminary instruction in the use of the Transit-Theodolite.
—Plotting, Mensuration.

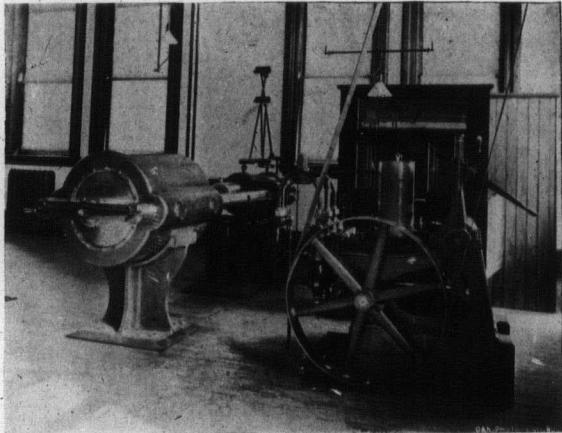
II. YEAR.

MATHEMATICS.

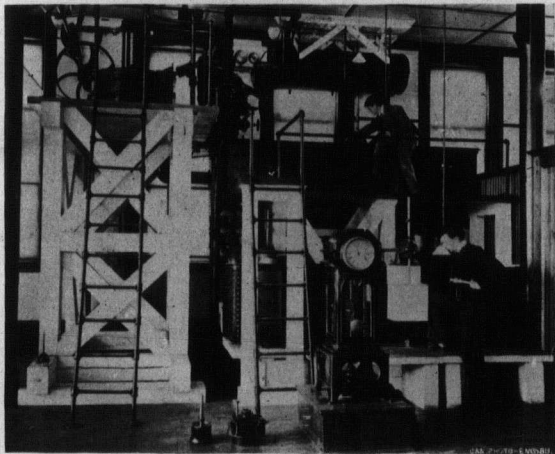
Differential and Integral Calculus.
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Plane Astronomy.

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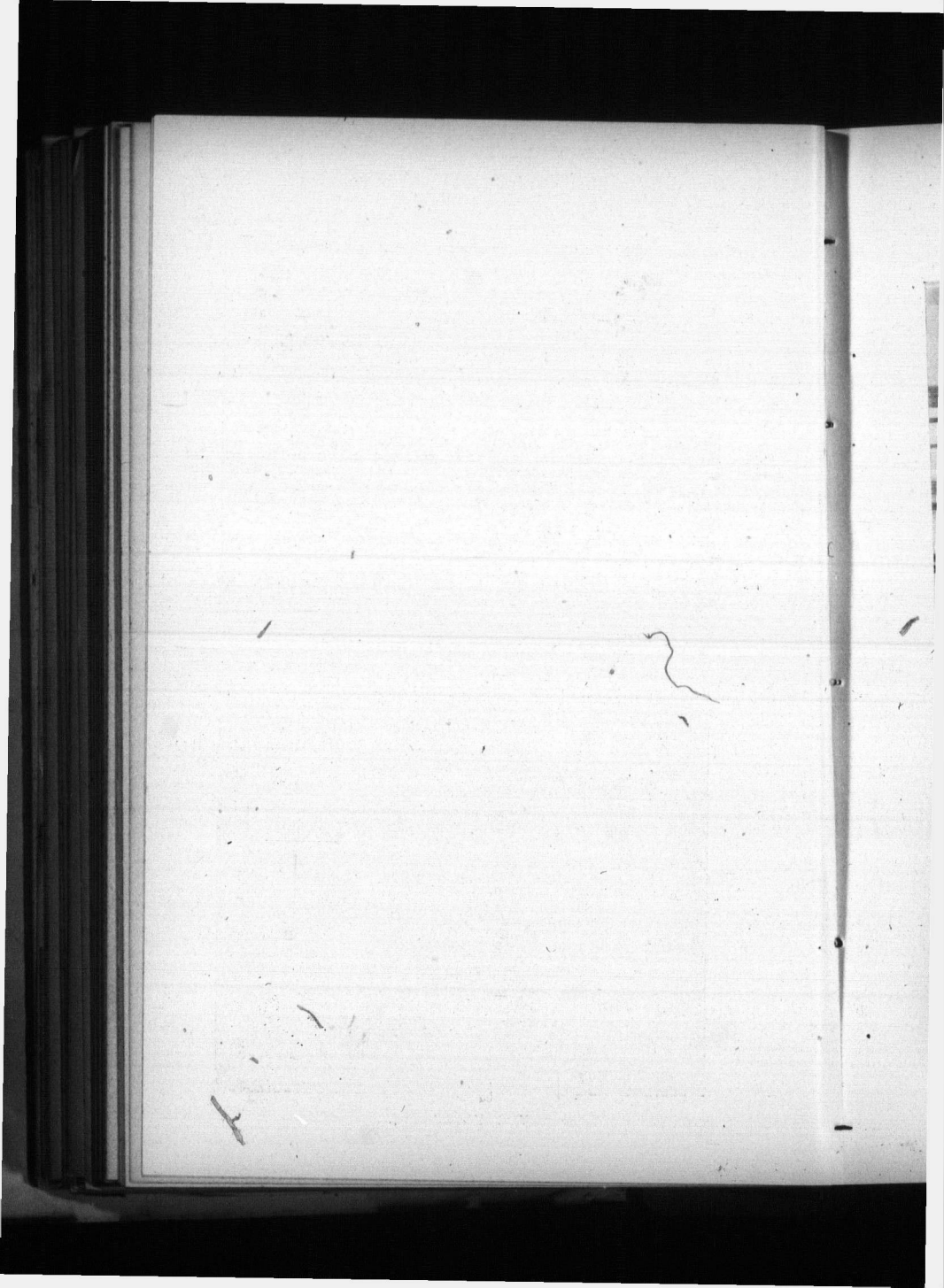


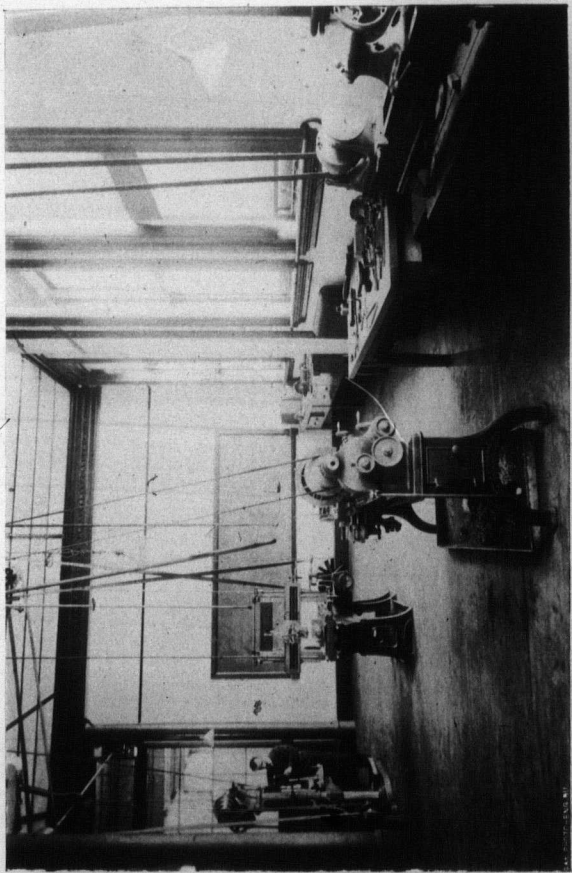
HYDRAULIC PLANT.

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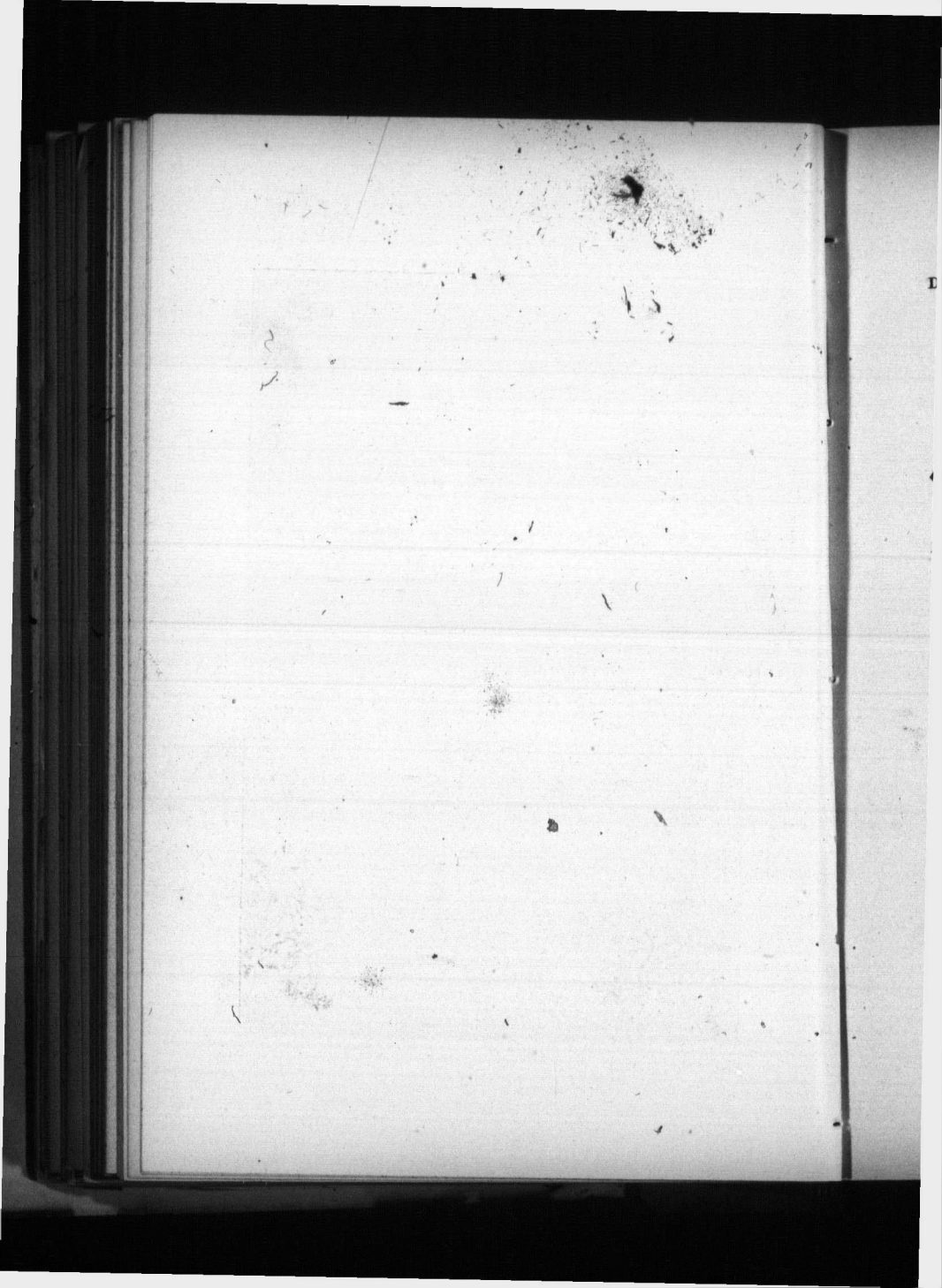
uctures and

Topography
t-Theodolite.





MACHINE SHOP.



DRAWING.

Subjects of First year continued.

Coloring and shading applied in both topographical and construction drawing.

Descriptive Geometry in its application to solids bounded by curved surfaces. The various projections of the sphere and principles of map construction.

Machines and structures. (Drawings made from both copies and original notes.)

CHEMISTRY.

Chemistry with special reference to industrial applications.

Practical Chemistry.

ENGINEERING AND SURVEYING.

Statics and Dynamics (pure and applied.)

Strength and Elasticity of Materials.

Experimental work in Engineering Laboratory.

Transit-Theodolite Surveying.

Levelling.

Railway Location, curves, etc.

Hydrographic Surveying.

MINERALOGY AND GEOLOGY.

Elements of these Sciences.

Blowpipe practice.

Determination of minerals.

METALLURGY.

Iron and Steel.

PHYSICS.

Hydrostatics.

Optics.

EXPERIMENTAL PHYSICS.

Light : Use of lenses and mirrors.

Calculation of focal lengths.

The prism and spectroscope.

Goniometer and heliostat.

VACATION WORK.

See pages 38 and 87.

III YEAR.

DRAWING.

Subjects of previous years cont nued.
 Descriptive Geometry.
 Shades and Shadows.
 Stone cutting.
 Perspective Projection.
 Original Designs—Bridges, Roofs, Floors, Arches, etc.

CHEMISTRY (APPLIED).

Thermo-Chemistry.
 Combustion.
 Fuel.
 Explosives.
 Artificial Lighting.
 Photography.

ENGINEERING AND SURVEYING.

Statics and Dynamics (pure and applied).
 Strength and Elasticity of Materials.
 Theory of Construction.
 Practical Designs.
 Bridges, Roofs, Floors.
 Arches, Retaining Walls.
 Foundations, etc.
 Thermodynamics and Theory of the Steam Engine.
 Hydraulics, Sewerage, Water Supply.
 Experimental work in Engineering Laboratory.
 Levelling.
 Profiles, Cross sections, Field work and Plotting.
 Computation of quantities.
 Mathematical Theory of Surveying Instruments.
 Trigonometrical and Barometrical Levelling.
 Geodesy (considering the earth a sphere).
 Practical Astronomy (treated in the manner required for the
 O.L.S. and D.L.S. Examinations).
 Least Squares.

MINERALOGY AND GEOLOGY.

✓ Economic Geology.

Blowpipe Analysis and Determinative Mineralogy.

EXPERIMENTAL PHYSICS.

Heat : Specific Heat ; Latent Heat.

Expansion of Air ; Air Thermometer.

VACATION WORK.

See pages 38 and 87.

II. DEPARTMENT OF MINING ENGINEERING.

This Department is designed to afford the necessary preliminary training to students intending to become Mining Engineers.

I. YEAR.**MATHEMATICS.**

Euclid, Algebra, Plane Trigonometry.

Analytical Plane Geometry.

DRAWING.

Copying from the flat. Lettering. Topography.

Graphics.

Descriptive Geometry in its application to plane-sided solids.

Orthographic (including Isometric) and Oblique Projection.

Original Surveys.

CHEMISTRY.

| Elementary Chemistry, with Laboratory Practice.

MECHANICS.

Statics and Dynamics (with special reference to structures and machines).

SURVEYING.

Field and Office Work—Chain and Compass Surveys—Topography—Preliminary instruction in the use of the Transit-Theodolite—Plotting, Mensuration.

II. YEAR.

MATHEMATICS.

Differential and Integral Calculus.
Spherical Trigonometry.

DRAWING.

Subjects of First Year continued.
Coloring and shading applied in both topographical and construction drawing.
Descriptive Geometry in its application to solids bounded by curved surfaces. The various projections of the sphere and principles of map construction.
Machines and structures. (Drawings made from both copies and original notes.)

CHEMISTRY.

Chemistry, with special reference to industrial applications.
Practical Chemistry.

ENGINEERING AND SURVEYING.

Statics and Dynamics (pure and applied).
Strength and Elasticity of Materials.
Experimental work in Engineering Laboratory.
Transit-Theodolite Surveying.
Levelling.
Railway location, curves, etc.
Mining Surveying.

MINERALOGY AND GEOLOGY.

Elements of these Sciences.
Blowpipe Practice.
Determination of Minerals.
Lithology.

METALLURGY.

Iron and Steel.

PHYSICS.

Hydrostatics.
Optics.

EXPERIMENTAL PHYSICS.

Light : Use of lenses and mirrors.
 Calculation of focal lengths.
 The prism and spectroscope.
 Goniometer and heliostat.

VACATION WORK.

See pages 38 and 87.

III YEAR.**DRAWING.**

Subjects of previous years continued.
 Descriptive Geometry.
 Shades and Shadows.
 Stone cutting.
 Perspective Projection.
 Original Designs—Bridges, Roofs, Floors, etc.

CHEMISTRY (APPLIED).

Thermo-Chemistry.
 Combustion.
 Fuel.
 Explosives.
 Artificial Lighting.
 Photography.
 Laboratory work in Qualitative and Quantitative Analysis.

ENGINEERING AND SURVEYING.

Statics and Dynamics (pure and applied).
 Strength and Elasticity of Materials.
 Theory of Construction.
 Thermodynamics and Theory of Steam Engine.
 Hydraulics.
 Experimental work in Engineering Laboratory.
 Levelling.
 Profiles, cross-sections, field work and plotting.
 Computation of quantities.
 Mathematical Theory of Surveying Instruments.
 Trigonometrical and Barometrical Levelling.

MINERALOGY AND GEOLOGY.

Economic Geology.

Paleontology.

Ore Deposits.

Blowpipe Analysis and Determinative Mineralogy.

Metallurgy of Gold, Silver, Nickel, Copper, etc.

Mining and Ore Dressing.

Assaying.

VACATION WORK.

See pages 38 and 87.

III. DEPARTMENT OF MECHANICAL AND ELECTRICAL ENGINEERING.

This Department is intended to afford the necessary preliminary preparation to students intending to become Mechanical and Electrical Engineers.

I. YEAR.**MATHEMATICS.**

Euclid, Algebra, Plane Trigonometry.

Analytical Plane Geometry.

DRAWING.

Copying from the flat. Lettering.

Graphics.

Descriptive Geometry in its application to plane-sided solids.

Orthographic (including Isometric) and Oblique Projection.

CHEMISTRY.

Elementary Chemistry with Laboratory Practice.

MECHANICS.

Statics and Dynamics (with special reference to structures and machines).

SURVEYING.

(Lectures only.) Applications of Trigonometry and Principles of Measurement.

PHYSICS.

Magnetism and Electricity.

EXPERIMENTAL PHYSICS.

Light: Use of lenses and mirrors.

Calculation of focal lengths.

The prism and spectroscope.

Goniometer and heliostat.

II. YEAR.**MATHEMATICS.**

Differential and Integral Calculus.

Spherical Trigonometry.

DRAWING.

Subjects of first year continued.

Coloring and shading applied in construction drawing.

Descriptive Geometry in its application to solids bounded by curved surfaces. The various projections of the sphere.

Machines and structures. (Drawings made from both copies and original notes.)

CHEMISTRY.

Chemistry, with special reference to industrial applications.

Practical Chemistry.

ENGINEERING.

Statics and Dynamics (pure and applied).

Theory of Mechanism.

Strength and Elasticity of Materials.

Materials and Construction.

Methods and Processes.

Experimental work in Engineering Laboratory.

METALLURGY.

Iron and Steel.

PHYSICS.

Hydrostatics.

Optics.

Electrical Measurements.

EXPERIMENTAL PHYSICS.

Heat : Specific Heat ; Latent Heat.

Expansion of Air ; Air Thermometer.

ELECTRICAL LABORATORY.**VACATION WORK.**

See pages 38 and 87.

III. YEAR.**DRAWING.**

Subjects of previous years continued.

Descriptive Geometry.

Shades and Shadows.

Stone cutting.

Perspective Projection.

CHEMISTRY (APPLIED).

Thermo-Chemistry.

Combustion.

Fuel.

Explosives.

Artificial Lighting.

Photography.

ENGINEERING.

Subjects of previous years continued.

Applied Mechanics :

Mechanics of Machinery.

Machine Design.

Thermodynamics and Theory of the Steam Engine.

Hydraulics.

Electricity :

Dynamos and motors.

Application of principles to practical problems connected with the design, construction and testing of various prime motors and machines.

Experimental work in Engineering Laboratory.

Least Squares.

METALLURGY.

Gold, Silver, Nickel, Copper, Lead.

EXPERIMENTAL PHYSICS.

Terrestrial Magnetism.

ELECTRICAL LABORATORY.**ORIGINAL DESIGNS.**

Engine and Machine Design.

VACATION WORK.

See pages 38 and 87.

In addition to taking the course of instruction in the School and passing the requisite examinations, a candidate for the diploma in Mechanical and Electrical Engineering will be required to present satisfactory evidence of having had at least one year's good practical experience in one of the principal occupations connected with mechanical work, such as machinist, pattern-maker, moulder, steam engineer, etc. There is no restriction as to the place where the candidate may have gained such practical experience.

IV. DEPARTMENT OF ARCHITECTURE.

This course is designed to afford the necessary preliminary training to students intending to become Architects.

I. YEAR.**MATHEMATICS.**

Euclid, Algebra, Plane Trigonometry.
Plane Analytical Geometry.

DRAWING.

Copying from the flat. Lettering. Topography.
Graphics.
Descriptive Geometry in its application to plane sided solids,
Orthographic (including Isometric) and Oblique Projection.
Rendering in pencil and pen and ink.

CHEMISTRY.

Elementary Chemistry with Laboratory Practice.

MECHANICS.

Statics (with reference to structures).

Dynamics (preliminary to the study of hydraulics).

SURVEYING.

Principles, Chain Surveying, Mensuration.

PHYSICS.

Acoustics.

HISTORY OF ARCHITECTURE.

General introduction to subject.

Ancient Architecture.

Egyptian, Assyrian and Persian.

II. YEAR.**MATHEMATICS.**

Differential and Integral Calculus.

DRAWING.

Instrumental Drawing, Drawing from the Cast, Sketching and

Water Color, Pen and Ink.

Descriptive Geometry (curved surfaces).

CHEMISTRY.

Chemistry, with special reference to industrial applications.

Practical Chemistry.

MECHANICS.

Statics (pure and applied).

Strength and Elasticity of Materials.

Materials of Construction.

Experimental work in Engineering Laboratory.

SURVEYING.

Use of transit and level.

Mensuration.

MINERALOGY AND GEOLOGY.

Elements. 1

METALLURGY.

Iron and Steel.

PHYSICS.

Hydrostatics.

Optics.

EXPERIMENTAL PHYSICS.

Light : Uses of lenses and mirrors.

Calculation of focal lengths.

The prism and spectroscope.

Goniometer and heliostat.

Acoustics : Laws of vibrating strings.

Determination of Pitch.

Velocity of Sound.

Electric Fork.

Chronograph.

HISTORY OF ARCHITECTURE.

Greek and Roman.

Romanesque and Byzantine.

ORDERS AND ELEMENTS OF ARCHITECTURE.**HISTORY OF ORNAMENT.**

Ancient.

Classic—Greek, Roman.

VACATION WORK.

See pages 38 and 87.

III. YEAR.**DRAWING.**

Descriptive Geometry.

Shades and Shadows.

Stone cutting.

Perspective Projection.

Water Color sketching.

Original Designs—Floors, Trusses, Arches, etc.

CHEMISTRY (APPLIED).

Thermo-Chemistry.
Combustion.
Fuel.
Explosives.
Artificial Lighting,
Photography.

THEORY OF CONSTRUCTION.

Experimental work in Engineering Laboratory.

HYDRAULICS.**SANITARY SCIENCE.**

House Drainage and Plumbing, Ventilation and Heating.

SURVEYING.

Levelling, Setting out Excavation, Mensuration.

MINERALOGY AND GEOLOGY.

Economic Geology.

EXPERIMENTAL PHYSICS.

Heat : Specific Heat ; Latent Heat.
Expansion of Air ; Air Thermometer.

HISTORY OF ARCHITECTURE.

Gothic and Renaissance, with special reference to England.

HISTORY OF ORNAMENT.

Early Christian ; Gothic and Renaissance.

PRINCIPLES OF DECORATION.**VACATION WORK.**

See pages 38 and 87.

V. DEPARTMENT OF ANALYTICAL AND APPLIED CHEMISTRY.

This Department is designed to afford the necessary preliminary training to students who intend to become chemists by profession, either as analytical chemists or industrial chemists.

I. YEAR.

MATHEMATICS.

Euclid, Algebra, Plane Trigonometry.

DRAWING.

Copying from the flat. Lettering.
Descriptive Geometry in its application to plane sided solids.
Orthographic (including Isometric) and Oblique Projection.
Model Drawing.

CHEMISTRY.

Elementary Chemistry with Laboratory practice.

MECHANICS.

Statics and Dynamics.

PHYSICS.

Magnetism and Electricity.

EXPERIMENTAL PHYSICS.

Light: Use of lenses and mirrors.
Calculation of focal lengths.
The prism and spectroscope.
Goniometer and heliostat.

MODERN LANGUAGES.

French.
German.

II. YEAR.

CHEMISTRY.

Inorganic and Physical Chemistry.
Applied Chemistry.
Laboratory work in Quantitative and Qualitative Analysis.

MINERALOGY AND GEOLOGY.

Elementary Mineralogy and Blowpipe Practice.
Physical Geography, Palæontology and Geology.

METALLURGY.

Iron and Steel.

PHYSICS.

Hydrostatics.
Optics.
Heat.
Electricity.

EXPERIMENTAL PHYSICS.

Heat : Specific Heat ; Latent Heat.
Expansion of Air ; Air Thermometer.

ELECTRICAL LABORATORY.

MODERN LANGUAGES.

French.
German.

VACATION WORK.

See pages 38 and 87.

III. YEAR.

CHEMISTRY.

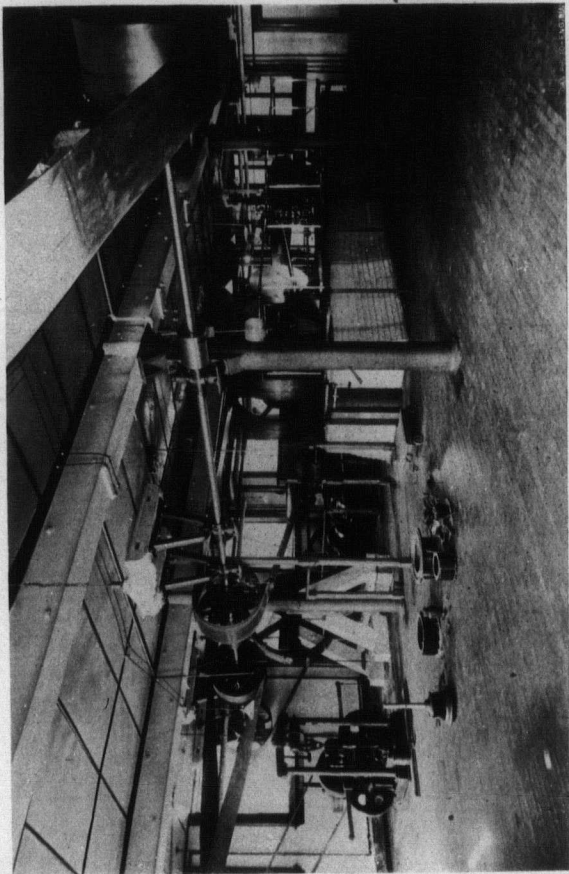
Organic Chemistry and Chemical Physics.
Applied Chemistry.
Laboratory work.

MINERALOGY AND GEOLOGY.

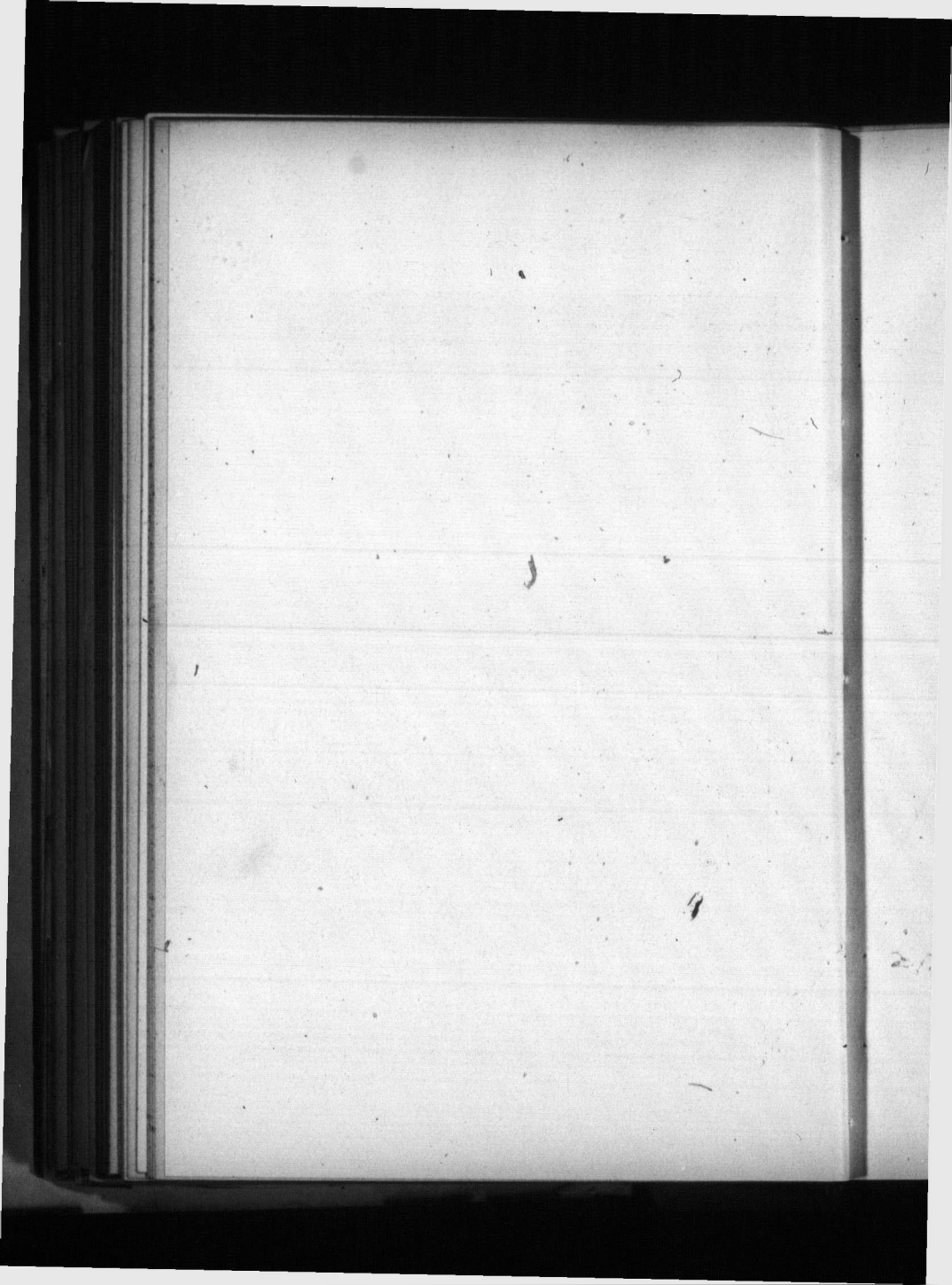
Economic Geology.
Blowpipe Analysis and Determinative Mineralogy.

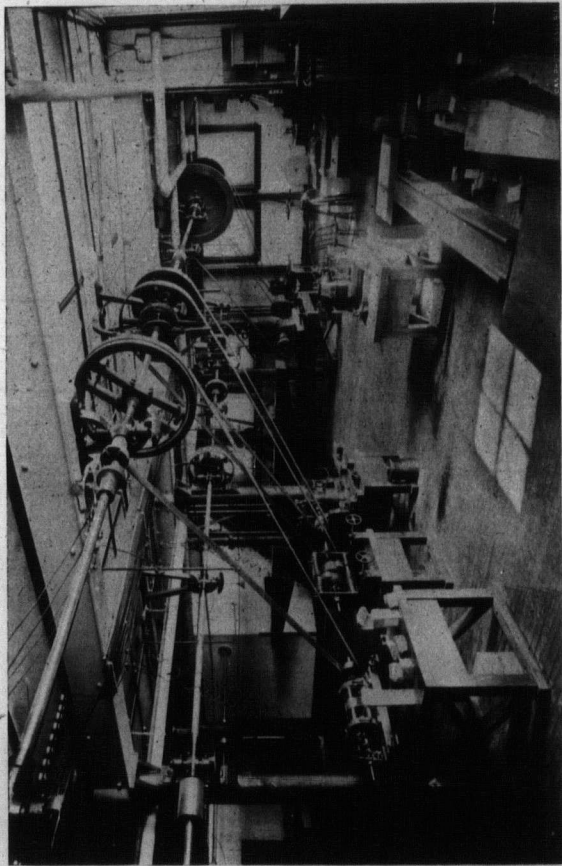
METALLURGY.

Gold, Silver, Nickel, Copper, Lead.



EXPERIMENTAL ENGINE.





DYNAMO ROOM.



E

F

V

EXPERIMENTAL PHYSICS.

Terrestrial Magnetism.

BIOLOGY.

VACATION WORK.

See pages 88 and 87.

THE FOURTH YEAR.

After the completion of the general three years' course in any department, students are recommended to take up the special work of the fourth year, leading to the degree of Bachelor of Applied Science, University of Toronto. It is only by so doing that full advantage can be taken of the splendid laboratory equipment of the school. The fourth year enables students to continue under certain restrictions the study of subjects in which they take special interest and is the means adopted in the School of Practical Science of affording them the advantage of optional and special studies.

To be admitted to the fourth year a candidate must be a graduate of the School of Practical Science or an undergraduate of the standing of the fourth year in the University of Toronto in the Honor Department of Chemistry and Mineralogy.

The subjects of study in the fourth year are arranged in the following groups and sub-divisions :

- A. { Astronomy.
Geodesy and Metrology.
- B. { Architecture.
Strength and Elasticity of Materials.
Hydraulics.
Thermodynamics and Theory of Heat Engines.
Electricity and Magnetism.
- C. { Industrial Chemistry.
Sanitary and Forensic Chemistry.
Inorganic and Organic Chemistry.
- D. { Mineralogy and Geology.
Metallurgy and Assaying.

Each student will be required to confine his studies during the session to one of the above groups. He will not be allowed to take less than two nor more than three of the sub-divisions in any group.

The sub division "Inorganic and Organic Chemistry" will be obligatory on all students who select group C.

A student is liable to be called on to assist in any of the experimental and practical work in the group which he has selected, although it may not belong to his special subjects.

Candidates are required to notify the Secretary in writing of their intention to take the fourth year work at least one week before the opening of the session, and to inform him at the same time as to the subjects which they propose to take. These subjects will be submitted to the Council for approval at the beginning of the session, and no student will be permitted to take any subjects not so approved.

Undergraduates of the University of Toronto of the standing of the fourth year in the Honor Department of Chemistry and Mineralogy may be admitted as students in the fourth year in the groups C. and D.

Candidates will be required to show a good working acquaintance with translation from either French or German. This will be tested by their ability to translate extracts from scientific works or periodicals not previously specified.

PASS AND HONORS.

Total marks assigned to fourth year 900.

Sub-divided as follows:—

Work (reckoned in hours) 540 marks.

Records (notes, drawings, etc) 360 "

FOR PASS.

The minimum percentages are:

Work, 75 per cent. 405 marks.

Records, 50 " 180 "

And two-thirds of the total marks assigned 600 "

FOR HONORS.

In deciding the allotment of honors the whole academic record of the candidate will be taken into consideration, but no honors will be granted unless the candidate shall have received a special recommendation from the member or members of Council under whose supervision his fourth year work has been done.

Honors granted will be mentioned in the certificate required under clause 2 of the statute of the University of Toronto respecting the degree of B.A.Sc.

The above certificate will not be granted to students who have been absent without leave of the Council from more than ten per cent. of the lectures and practical work of either term of the session.

Courses of reading will be indicated in connection with subjects of study.

The above regulations have been approved by the Senate of the University of Toronto in so far as they affect the degree of B.A.Sc.

DEGREE OF B.A.Sc.

Candidates who have fulfilled the requirements of the Fourth Year in the School of Practical Science are eligible for the degree of Bachelor of Applied Science in the University of Toronto in accordance with a statute passed by the Senate in 1892, which, with the amendments since made, is as follows :

BY THE SENATE OF THE UNIVERSITY OF TORONTO.

Be it enacted :

That the Degree of Bachelor of Applied Science (B.A.Sc.) be hereby established to be granted subject to the following conditions and regulations :

1. Candidates for the said degree shall hold the diploma of the School of Practical Science in any one of the regular courses of the said School, or shall be of the standing of the fourth year in the Honor Department of Chemistry and Mineralogy in the University of Toronty.
2. They shall have fulfilled the conditions relating to the Fourth or Post-Graduate year in the School of Practical Science, and shall present certificates of having done so to the Registrar of the University. Honors may be granted with such certificates by the Faculty of the School.
3. Each candidate shall prepare a Thesis based on the results of his Fourth Year work in the said School of Practical Science for the approval of the University examiners. This Thesis is to be

accompanied by all necessary drawings, specifications, tables and estimates. To pass in the Thesis a candidate must obtain fifty per cent., and to take honors seventy-five per cent., of the marks assigned.

4. Candidates will be required to select two sub-divisions in any one of the following groups, and to pass such written and oral examinations on the subjects selected as may be prescribed by the University examiners.

- A. { Astronomy.
Geodesy and Metrology.
- { Architecture.
Strength and Elasticity of Materials.
- B. { Hydraulics.
Thermodynamics and Theory of Heat Engines.
Electricity and Magnetism.
- { Industrial Chemistry.
- C. { Sanitary and Forensic Chemistry.
Inorganic and Organic Chemistry.
- D. { Mineralogy and Geology.
Metallurgy and Assaying.

The sub-division "Inorganic and Organic Chemistry" will be obligatory on all candidates who select group C.

To pass in each subject thirty-three per cent., and to take honors sixty-six per cent. of the marks assigned will be required.

5. The degree with honors will be conferred on candidates who obtain three out of the four honors possible.

Viz.— Certificate with honors(cl. 2.)

Thesis with honors(cl. 3.)

Honors in each subject of examination ... (cl. 4.)

6. Candidates are required to send to the Registrar of the University at least three weeks before the commencement of the annual examinations an application for examination according to a printed form to be obtained from the Registrar, and such application must be accompanied by a fee of ten dollars.

7. The examination for the degree shall be held in May.

8. The fee for the degree shall be ten dollars and shall be paid to the Registrar not later than the first day of May.

9. The ordinary time for conferring the degrees shall be at the University commencement in June. The degrees may be conferred at any meeting of the Senate.
10. The thesis, drawings, and other papers accompanying them, shall be the property of the University.
11. In case any change be made in the conditions referred to in the second clause, such change shall be submitted to the Senate and shall have no force so far as the said clause is concerned unless approved by resolution of the Senate.

SUBSEQUENT PROFESSIONAL DEGREES.

The attention of graduates is directed to the following statute, passed by the Senate of the University of Toronto in 1896 :

BY THE SENATE OF THE UNIVERSITY OF TORONTO.

Be it enacted—

- I. That all previous Statutes of the University relating to degrees or diplomas in Engineering be repealed.
- II. That the following degrees be hereby established, viz., Civil Engineer (C. E.), Mining Engineer (M. E.), Mechanical Engineer (M. E.), Electrical Engineer (E. E.)
- III. That the following be the conditions and regulations governing the conferring of the said degrees :
1. A candidate for one of the said degrees shall hold the diploma of the School of Practical Science and the degree of Bachelor of Applied Science of the University of Toronto, except in the case provided for in clause 11 hereunder.
 2. He shall have spent at least three years after receiving the degree of Bachelor of Applied Science in the actual practice of the branch of Engineering wherein he is a candidate for a degree.
 3. Intervals of non-employment or of employment in other branches of Engineering shall not be included in the above three years. It shall not be necessary that the several periods requisite to make up the said three years be consecutive.

4. Satisfactory evidence shall be submitted to the University Examiners as to the nature and length of the candidate's professional experience for the purposes of clauses 2 and 3.
The Examiners shall satisfy themselves by oral or written examinations in regard to the candidate's experience and competence.
5. The candidate shall prepare an original Thesis on some engineering subject in the branch in which he wishes a degree; the said Thesis to be accompanied by all necessary descriptions, details, drawings, bills of quantities, specifications, and estimates.
The candidate may be required at the option of the Examiners to undergo an examination in the subject of this Thesis.
6. Notices in writing shall be sent to the Registrar not later than the first day of February, informing him of the degree to which the candidate wishes to proceed, and of the title of his proposed Thesis, for the approval of the Senate.
7. The evidence under clause 4, and the Thesis, with accompanying papers, described in clause 5, shall be sent to the Registrar not later than the first day of May.
8. The candidate shall be required to present himself for examination in the month of May at such times as may be arranged by the Registrar.
9. The fee for any one of the said degrees shall be twenty dollars, and shall be paid to the Registrar not later than the first day of May.
10. The Thesis, drawings and other papers submitted under clause 7 shall become the property of the University.
11. Candidates who graduated from the School of Practical Science before June, 1895, shall not be required to hold the degree of Bachelor of Applied Science.

For further information apply to the Registrar of the University of Toronto.

DOMINION AND ONTARIO LAND SURVEYORS.

Courses of instruction will be given in accordance with the requirements of the Statutes relating to the Dominion and Ontario Land Surveyors, which will enable the students, who, after examination, obtain certificates therein and who have otherwise fulfilled the provisions of the

said Statutes, to present themselves for final examination before the proper Boards, at an earlier period in their apprenticeship than would otherwise be permitted.

Extracts from the Provincial Act respecting Land Surveyors and Survey of Lands. (Cap. 152, R.S.O.)

" 12.—(2) Any person who has followed a regular course of study at the Ontario School of Practical Science in the subjects of drawing, surveying and levelling, and geodesy and practical astronomy, and who has thereupon received, after due examination, a certificate of having passed one session, two sessions, or three sessions, as the case may be, in the study of the aforesaid subjects, may, after having passed the preliminary examination hereinbefore required for admission to apprenticeship with a land surveyor, be received as an apprentice by any practising land surveyor, and shall thereupon, if he has received a certificate of having passed three sessions in the study of the said subjects be only holden to serve as such apprentice during twelve successive months of actual service ; or, in case he has received a certificate of having passed only one or two sessions, as the case may be, in the study of the said subjects, then, for such time of actual service as, with the period spent by him at such session or sessions, suffices to make up the full term of three years.

" (3) After such actual service, such person shall, subject to the other provisions of this Act, have the same right to present himself for and to undergo the examination required by law and, if found qualified, then to be admitted to practice as a land surveyor, as if he had served the full three years' apprenticeship otherwise required by law.

" 14. The privilege of a shorter term of apprenticeship shall also be accorded to any graduate of the Military College at Kingston and of the Ontario School of Practical Science, and such person shall not be required to pass the preliminary examination hereinbefore required for admission to apprenticeship with a land surveyor, but shall only be bounden to serve under articles with a practising land surveyor duly filed as required by section 17 of this Act, during twelve successive months of actual practice, after which, on complying with all the other requirements, he may undergo the examination by this Act prescribed.

Extract from the Dominion Lands Act.

" Every graduate in surveying of the Royal Military College of Canada, and every person who has followed a regular course of study in all branches of education required by this Act for admission as a Dominion Land Sur-

veyor, through the regular sessions, for at least two years in any College or University where a complete course of theoretical and practical instruction in surveying is organized, and who has thereupon received from such College or University a Diploma as Civil Engineer, shall be exempt from serving three years as aforesaid, and shall be entitled to examination after one year's service under articles with a Dominion Land Surveyor, at least six months of which service has been in the field, on producing the affidavit required by the next preceding clause as to such service; but it shall rest with the Board to decide whether the course of instruction in such College or University is that required by this clause.

The attention of the Candidates for the Diploma of D. T. S., given by the Dominion Board of Examiners, is directed to the facilities afforded for preparation in the School.

Extracts from the Ontario Architects' Act.

" 21. Any student who has matriculated in Arts in any University in Her Majesty's dominions, or in the Ontario School of Practical Science, shall not be required to pass the preliminary examinations.

" 23. Any person who applies for admission to registration as an architect after the coming into force of this Act, shall be not less than twenty-one years of age, shall have served as a student not less than five years with a principal or principals entitled to register under this Act, or with any other principal or principals approved by the council, and have passed such qualifying examinations as may be required by this Act.

" 24.—(3) Any person who has graduated from the Ontario School of Practical Science shall be required to serve only three years as a student, one of which three years may be served during the vacation of such school.

" (4) Upon and after the passing of this Act, students shall serve such term as is required to be served by the provisions of this Act, under indenture, to a registered architect, which indenture and any assignment thereof with affidavit of execution thereto attached shall be filed with the Registrar upon payment of such fees as the council may, by regulation, direct."

SYNOPSIS OF THE COURSES OF LECTURES AND PRACTICAL INSTRUCTION.

Text-books for the first year marked (a) ; for second year (b) ; for third year (c) and for fourth or post graduate year (d).

SUBJECTS TAUGHT BY THE FACULTY OF THE SCHOOL.

Subjects.	Instructors.
Organic and Inorganic Chemistry, Applied Chemistry,	} W. H. Ellis, M.A., M.B., Professor. } W. Lawson, B.A.Sc., Fellow.
Mineralogy and Geology, Petrography, Metallurgy and Assaying, Mining and Ore-dressing, German.	} A. P. Coleman, M.A., Ph.D., } Professor. } G. R. Mickle, B.A., Lecturer. } W. E. Boustead, B.A.Sc., } Acting Demonstrator.
Statics, Dynamics, Strength of Materials, Theory of Construction, Compound Stress, Hydraulics, Thermodynamics and Theory of the Steam Engine, French.	} J. Galbraith, M.A., Professor. } J. A. Duff, B.A., Lecturer. } W. Minty, B.A.Sc., Fellow.
Drawing, Architecture, Plumbing, Heating and Ventilation, Mortars and Cements, Brick and Stone Masonry.	} C. H. C. Wright, B.A.Sc., Lecturer. } Jcs. Keele, B.A.Sc., Fellow.
Surveying, Geodesy and Astronomy, Spherical Trigonometry, Least Squares, Descriptive Geometry.	} L. B. Stewart, D.T.S., Lecturer. } A. T. Laing, B.A.Sc., Fellow.
Electricity, Magnetism, Machine Design, Mechanics of Machinery, Rigid Dynamics.	} T. R. Rosebrugh, M.A., Lecturer. } A. E. Blackwood, Grad.S.P.S., Fellow.

SUBJECTS TAUGHT BY THE UNIVERSITY PROFESSORIATE

Algebra, Euclid, Plane Trigonometry, Analytical Geometry, Calculus, Astronomy.	}	Alfred Baker, M.A., Professor. A. T. DeLury, B.A., Lecturer. W. J. Rusk, B.A., Fellow.
Sound, Light, Heat, Electricity and Magnetism, Hydrostatics.		Jas. Loudon, M.A., LL.D., Professor. C. A. Chant, B.A., Lecturer. W. J. Loudon, B.A., Demonstrator. J. C. McLennan, B.A., Assistant Demonstrator.
Inorganic and Physical Chemistry.	}	W. H. Pike, M.A., Ph.D., Professor. W. L. Miller, B.A., Ph.D., Demonstrator.

DRAWING.

Model Drawing, Machines and Structures, Map and Topographical Drawing, Designs and Estimates, Graphical Calculations.

Descriptive Geometry, including Practical Geometry (Plane and Solid); Orthographic, Oblique and Perspective Projections; Intersections of Surfaces, Shades and Shadows, Stone Cutting, Theory of Mechanism, Theory of Mapping, etc.

Text-Books and Books of Reference.—Davidson—Projections.

Angel—Plane and Solid Geometry.

Binn—Orthographic Projection.

Millar—Descriptive Geometry, (a),

(b).

Warren—Stone Cutting (c).

MacCord—Lessons in Mechanical Drawing.

Worthen—Topographical Drawing,

(a), (b), (c).

SURVEYING AND LEVELLING.

LAND SURVEYING.

Chain Surveys.

Compass and Theodolite Surveys.

Methods of keeping Field Notes.

Determination of Heights and Distances.

Plotting.

LEVELLING.

Longitudinal and Cross Sections.
Plotting.

SETTING OUT.

Setting out Straight Lines and Curves.
Setting out Levels.

MENSURATION.

Lines, Surfaces and Solids.
Timber, Masonry, Iron and Earthwork.
Capacity of Reservoirs, etc.

Lectures are also given on the distinctive features of Mining and Hydrographic Surveying.

Text-Books.—Murray—Manual of Land Surveying (a).
Gillespie—Higher Surveying (b), (c), (d).
Henck or Trautwine—Railway Curves (b), (c).
Johnson—Theory and Practice of Surveying.

PRACTICAL ASTRONOMY AND GEODESY.

ORDINARY COURSE.

The work included in this course is sufficient to fulfil the requirements of the final examination for Provincial and Dominion land surveyors.

In astronomy the principal subjects are the determination of time, latitude and azimuth, and the general principles of the methods of determining longitude. Practical instruction is given in the methods of taking observations.

In geodesy all surveys, computations and methods of map construction are based upon the supposition that the earth is a sphere.

ADVANCED COURSE (FOURTH YEAR).

The work in this course is intended to fulfil the requirements of the final examinations for Dominion Topographical Surveyors. It is distinguished from the work of the ordinary course not so much by the subjects as by the degrees of refinement to which the investigations are carried.

In geodesy the earth is considered as a spheroid.

Text-Books.—Gillespie—Higher Surveying (b), (e), (d).

Green—Spherical and Practical Astronomy (e), (d).

Chauvenet—Spherical and Practical Astronomy.

Doolittle—Practical Astronomy.

Gore—Elements of Geodesy (c), (d).

Helmert—Hohere Geodasie.

Nautical Almanac, 1897 (c), (d).

APPLIED MECHANICS.

STATICS,

The calculation of the stresses in framed structure, solid and riveted beams, arches, etc. Both graphical and analytical methods used.

THEORY OF THE STRENGTH AND ELASTICITY OF MATERIALS.

THEORY OF COMPOUND STRESS.

DESIGNING OF STRUCTURES in timber, iron and masonry—arches, retaining walls, roofs, bridges, etc.

DYNAMICS.

Representation and measurements of forces and motions.

Principles of work and energy.

Efficiency of machines. Friction.

Transmission of energy—belts, shafts, crank and connecting rod, etc.

Fly-wheels, governors.

Balancing of machinery, etc., etc.

STRENGTH OF THE PARTS OF MACHINES.

MACHINE DESIGN—

HYDRAULICS.

Discharge of water through orifices, notches, etc. Flow in pipes, and open channels. Sewerage, Water-works, Water-power, Water-wheels, Turbines, Pumps, etc.

THERMODYNAMICS AND THEORY OF THE STEAM ENGINE.

Text-Books and Books of Reference.—Von Ott—Graphic Statics (a).

Du Bois—Graphic Statics.

“ Strains in Framed Structures.

Johnson—Modern Framed Structures.

Merriman and Jacoby—Roofs and Bridges.

Merriman—Mechanics of Materials (b), (c), (d).

Rankine—Applied Mechanics (c), (d).

Lanza—Applied Mechanics (d).

Unwin—Testing of Materials of Construction.

Baker—Masonry construction (d).

Patton—Foundations (d).

Kidder—Architect and Builders' Pocket Book.

Low and Bevis—Machine Drawing and Design (b), (c).

Low—Machine Drawing (a), (b), (c).

Unwin—Elements of Machine Design (c).

Shann—Elementary Treatise on Heat (c), (d).

Peabody—Thermodynamics (d).

“ Steam Tables (d).

Carpenter—Experimental Engineering (d).

Kennedy—Mechanics of Machinery (b), (c).

- Text-Books and Books of Reference.*—Meriman—Hydraulics (c), (d).
 Bodmer—Hydraulic Motors, Turbines, etc., (d).
 Innes—Centrifugal Pumps, Turbines and Water Motors (d).
 Gerhard—House Drainage and Sanitary Plumbing (c).
 Santo Crimp—Sewage Disposal Works.
 Billings—Heating and Ventilation;
 Trautwine—Engineer's Pocket Book.
 Carnegie—Pocket Companion.

THEORY OF MECHANISM.

Principles of the transmission of motion without reference to force.

Pitch surfaces, spur wheels, bevel wheels, skew-bevel wheels, trains of wheelwork, teeth of wheels, cams, cranks, eccentrics, links, bands and pulleys, hydraulic connections, frictional gearing, link motion for slide valves, etc., etc.

- Text-Books and Books of Reference.*—Rankine—Machinery and Millwork.
 Halsey—Slide Valve Gears.
 MacCord—Slide Valve and Eccentric.
 Goodeve—Elements of Mechanism (b).
 Kennedy—Mechanics of Machinery (b), (c).

ELECTRICITY.

Instruction is given in this subject by laboratory work in the laboratories both of the School and of the University of Toronto, as well as by courses of lectures partly in the School and partly in the University. The work comprises—

ELEMENTARY ELECTRICITY AND MAGNETISM.

MEASURING INSTRUMENTS—

Theory and uses in determining current, electromotive force, resistance, capacity, strength of field, magnetic inductance, etc., etc.

MATHEMATICAL THEORY OF ELECTRICITY.

APPLICATIONS OF ELECTRICITY—

Laboratory work and lectures on telegraph, telephone, dynamos, electric lighting; arc and incandescent systems, storage batteries, transmission of power by electricity, etc.

THEORY OF ALTERNATING CURRENT GENERATORS AND TRANSFORMERS.

Text-Books and Books of Reference.—Kennelly and Wilkinson—Practical

Notes for Electric Students (a), (b).

Stewart and Gee—Practical Physics
b).

Kempe—Electrical Testing (b).

Cumming—Theory of Electricity (c).

Thompson, S. P.—Dynamo Electric
Machinery (c), (d).

Kapp—Electric Transmission of
Energy (d).

Blakesley—Alternating Currents (d).

Bedell and Crehore—Alternate
Currents (d).

Fleming—Alternate Current Trans-
formers, Vol. I. and II. (d).

Current numbers of the "Electrician," the "Electrical World," and
"La Lumiere Electrique."

ARCHITECTURE.

HISTORY OF ARCHITECTURE—

Egyptian, Assyrian and Persian.

Classic.

Romanesque and Byzantine.

Gothic.

Renaissance.

ORDERS OF ARCHITECTURE.

HISTORY OF ORNAMENT.

PRINCIPLES OF DECORATION.

- Text-Books and Books of Reference.*—T. Roger Smith—Classic and Early Christian Architecture (a), (b).
 T. Roger Smith—Gothic and Renaissance (c).
 Fergusson—History of Architecture.
 Rickman—Gothic Architecture.
 Gwilt—Encyclopædia of Architecture.
 Vignole—The Five Orders of Architecture (b), (c).
 Leeds—Orders of Architecture (b).
 Owen Jones—Grammar of Ornament.
 Racinet—L'Ornement Polychrome.

MATHEMATICS.

The Pure Mathematics included in this course is taught in the University of Toronto.

The Applied Mathematics is taught partly in the University and partly in the school.

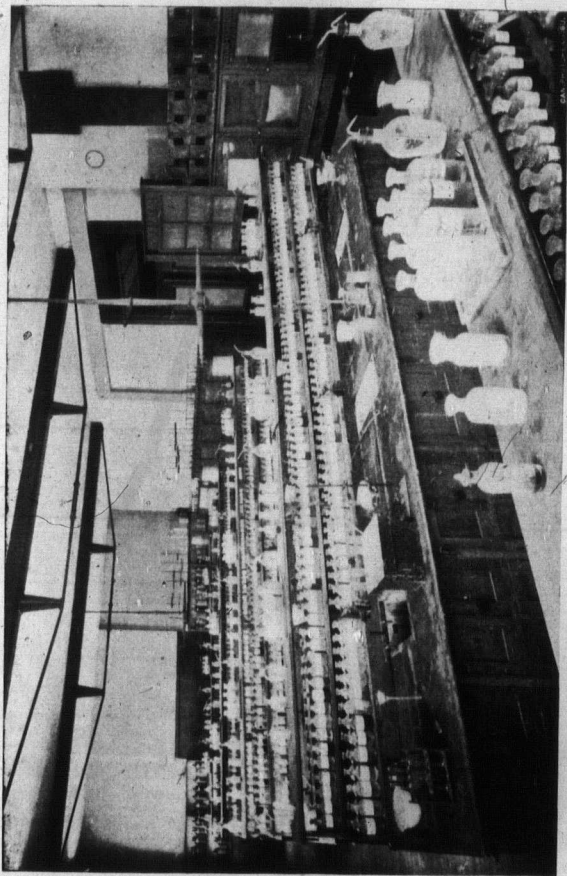
- Text-Books and Books of Reference.*—Todhunter—Algebra (a).
 “ Spherical Trigonometry (b)
 Mackay—Elements of Euclid (a)
 Hall & Knight—Plane Trigonometry (a).
 C. Smith—Conic Sections (a).
 Osborne—Calculus.
 Loomis—Calculus (b).
 Newcomb & Holden—Astronomy (b).
 Ganot—Physics (b).
 Hamblin Smith—Hydrostatics (b).
 Balfour Stewart—Heat.
 Loudon & McLennan—Practical Physics (b).
 Tyndall—Sound.

Classic and Early
 Architecture (a), (b).
 Gothic and Renais-
 sance
 s of Architecture.
 Architecture.
 Media of Architec-
 ture
 e Orders of Archi-
 tecture (b).
 Summary of Ornament.
 Chromatic Polychrome.

 taught in the Univer-
 sity and partly

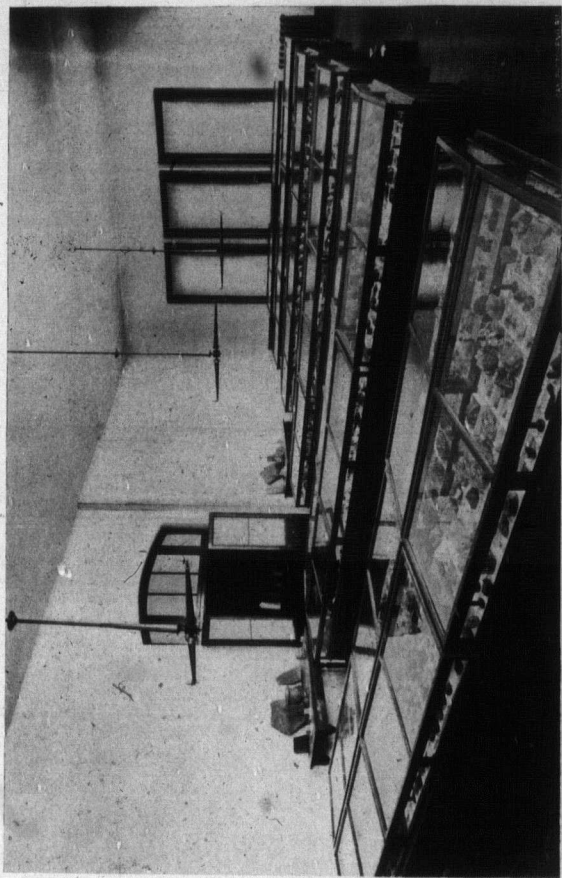
 Algebra (a).
 Spherical Trigonometry
 (b).
 Elements of Euclid (a)
 Plane Trigonometry

 o Sections (a).
 Optics.
 acoustics (b).
 Optics—Astronomy (b).
 Optics (b).
 1—Hydrostatics (b).
 2—Heat.
 Thomson—Practical Phy-
 sics.



CHEMICAL LABORATORY - QUALITATIVE ANALYSIS.





MINERALOGICAL COLLECTION.

S
C

CHEMISTRY.

All the instruction in this subject is given in the School of Practical Science.

COURSES BY THE PROFESSOR OF CHEMISTRY OF THE UNIVERSITY OF TORONTO.

Inorganic Chemistry.
Organic Chemistry.
Chemical Theory.
Physical Chemistry.

COURSES BY THE PROFESSOR OF APPLIED CHEMISTRY OF THE SCHOOL OF PRACTICAL SCIENCE.

Elementary Chemistry.
Applied Chemistry.

The Chemistry of Combustion, Fuels, Furnaces, Artificial Lighting, Explosives, Photography, Building Materials, Water, Air, Sewage, Chemical Manufactures.

Laboratory Work, including Technical Analysis, the Analysis of Food, Water and Air, and Toxicology.

Text-Books and Books of Reference.—Remsen—Inorganic Chemistry.
Richter—Inorganic Chemistry.
Richter—Organic Chemistry.
Roscoe & Schorlemmer—Treatise on Chemistry.
Miller, W. A.—Elements of Chemistry.
Meyer—Modern Theories of Chemistry.
Ostwald—Lehrbuch der Allgemeinen Chemie.
Ostwald—Outlines of General Chemistry.
Beilstein—Organic Chemistry.
Von Meyer & Jacobson—Lehrbuch der Organischen Chemie.
Thomson—History of Chemistry.
Wagner—Chemical Technology.
Sadtler—Organic Applied Chemistry.
Bloxham—Chemistry.
Fresenius—Qualitative and Quantitative Analysis.
Douglas & Johnson—Qualitative Analysis.
Sutton—Volumetric Analysis.

Text-Books and Books of Reference.—Continued.

- Jones—Practical Chemistry.
 Allen—Commercial Organic Analysis.
 Post—Chemische Technische Analyse.
 Winkler—Gas Analysis.
 Blyth, A. W.—Poisons.
 Blyth, A. W.—Foods.
 Bolley—Handbuch der Chemischen Technologie.
 Watt—Dictionary of Chemistry.
 Thorpe—Dictionary of Applied Chemistry.
 Meyer—History of Chemistry.
 Wurtz—History of Chemical Theory.
 Wurtz—Atomic Theory.
 Van't Hoff—Chemistry in Space.
 Pattison Muir—Thermo-Chemistry, Elements of.

MINERALOGY AND GEOLOGY.

MINERALOGY, GEOLOGY, MINING AND METALLURGY.

1. Mineralogy and Geology—

- Mineralogy and Crystallography.
 Geology and Palæontology.
 Lithology.
 Physical Geography.
 Blowpipe Analysis.
 Determinative Mineralogy.

Text-Books and Books of Reference.—Chapman—Mineralogy and Geology of Canada.

- Dana—Manual of Geology.
 Dana—System of Mineralogy.
 Nicholson—Palæontology.
 Geikie—Text-Book of Geology.
 Plattner—Manual of Blowpipe Analysis.
 Chapman or Brush—Mineral Tables.

2. Mining and Metallurgy—

- Mining Geology.
 Ore Dressing.
 Metallurgy of Iron and Steel.
 Metallurgy of Nickel, Copper, Silver, etc.
 Assaying.

Text Books and Books of Reference.—Ihlseng—Manual of Mining.
 Kohler—Bergbaukunde.
 Kuhnhardt—Ore Dressing.
 Phillips—Ore Deposits.
 Balling—Metallhuettenkunde.
 Schnabel—Allgemeine Huettenkunde.
 Phillips and Bauerman—Elements of
 Metallurgy.
 Mitchell—Assaying by Crookes.
 Kerr—Probirkunst.
 Kemp—Ore Deposits of the United
 States.

VACATION WORK.

THESIS AND CONSTRUCTION NOTES.

A subject is given at the end of each session on which the student is required to write a thesis (accompanied by drawings and specifications when necessary) during the subsequent vacation.

The engineering and architectural students are also required to make, during the vacation, full and clear notes of various constructions that may fall under their notice.

The value of both the thesis and the construction notes is taken into account in determining standing at the next following examination.

CIVIL ENGINEERING.

Subject of Thesis for Second Year.—Roads, Streets and Pavements.

“ “ Sanitary Drainage.

Books of Reference.—Gillmore—Roads, Streets and Pavements.

Spalding—Roads and Pavements.

Waring—Sanitary Drainage of Houses and Towns.

Latham—Sanitary Engineering.

MINING ENGINEERING.

Subject of Thesis for Second Year.—Ore-dressing.

Third: “ Mining.

Books of Reference.—Kuhnhardt—Ore-dressing in Europe.

Ihlseng—Manual of Mining.

MECHANICAL AND ELECTRICAL ENGINEERING.

Subject of Thesis for Second Year.—Machine-shop Practice.

“ *Third* “ Foundry Practice.

Books of Reference.—Rose—Practical Machinist.

West—American Foundry Practice.

Spretson—Casting and Founding.

ARCHITECTURE.

For the second year the following set of freehand pencil sketches is required :

- I. Doorway from the object ;
- II. Staircase “
- III. Fireplace, with cross sections ;

And seven sheets from the object, prints or drawings, with plans and sections where possible.

Subject of Thesis for Second Year.—The above sketches.

“ *Third* “ Twelve water-color studies.

ANALYTICAL AND APPLIED CHEMISTRY.

Subject of Thesis for Second Year.—Sulphuric Acid and Alkali Manufacture.

“ *Third* “ Coal Tar Products.

Books of Reference.—Lunge—Manufacture of Sulphuric Acid and Alkali.

Wagner—Chemical Technology.

Thorpe—Dictionary of Applied Chemistry.

Any other works on the above subjects may be consulted and results of original observations should be given.

ENGINEERING LABORATORY.

This Laboratory occupies two floors, having a total area of 10,000 square feet. It consists of three departments, viz :

- (a) The department for testing materials of construction.
- (b) The department for investigating the principles governing the application of power. This department is sub-divided into the steam laboratory, the hydraulic laboratory and electrical laboratory.
- (c) The department for investigating problems connected with standards of length, time, astronomical observations, etc.

In order to prepare specimens for the testing machines, a shop has been fitted up with a number of high-class machine tools specially suited for reducing the specimens to the requisite shapes and dimensions with a minimum of hand labor. It is also supplied with the necessary appliances for making ordinary repairs.

The machines in the department for testing materials are the following :

An Emery 50-ton machine, built by Wm. Sellers & Co., of Philadelphia, for making tests in tension and compression.

A Riehle 100-ton machine for making tests in tension, compression, shearing and cross-breaking. It will take in posts twelve feet long and beams up to eighteen feet in length.

An Olsen torsion machine for testing the strength and elasticity of shafting. This machine will twist shafts up to sixteen feet in length and two inches in diameter.

A Riehle 2,000 pounds cement testing machine. The cement testing room is fitted with all the usual accessories.

The equipment of the power department is as follows :

A Babcock and Wilcox 52-horsepower boiler.

A Harrison-Wharton 12-horsepower boiler.

A 50-horsepower Brown engine. This engine was constructed specially for experimental investigation. It is steam jacketed and has three alternative exhausts, to the open air, to a jet condenser, and to a Wheeler surface condenser, kindly presented to the School by Mr. F. M. Wheeler, of New York, the inventor.

There are also a Blake circulating pump, a Knowles air pump and a Blake feed pump, the latter of which was a gift from the manufacturers.

A machine for testing lubricating oils and measuring journal friction, built by Riehle Bros., of Philadelphia.

The hydraulic division of the laboratory is furnished with a three-throw pump with double acting cylinders. It has a capacity of 500,000 gallons per 24 hours. There are also large tanks furnished with orifices and weirs, measuring tanks, etc. A three-foot jet turbine, a nine-inch McCormick, and a six-inch New American turbine, the latter the gift of the firm of William Kennedy & Sons, Owen Sound, form a part of the same equipment.

The power department is equipped with the usual measuring instruments, indicators, gauges, gauge testing apparatus, scales, brakes, dynamometers.

The shafting is driven by a 7-horsepower Otto gas engine, a 20 kw. Edison motor, and the Brown engine above described.

In the geodetic and astronomical department are a 100-foot and a 66-foot standard of length; a 10-foot Rogers comparator with graduating attachment; a Kater's pendulum; a Howard astronomical clock and electro-chronograph; a Troughton & Simms 10-inch theodolite and all the ordinary surveying instruments.

ELECTRICAL LABORATORY.

The first section of this laboratory is the engineering division, in which a 20-kilowatt motor furnishes power to drive several continuous current dynamos of constant potential and constant current, as well as an alternator. There are constant potential motors of 6-horsepower and 3-horsepower, besides some smaller motors, among which is one for alternating current, and it is expected that this year there will be added a polyphase motor, and a rotary converter.

On the walls, besides rheostats, are four types of transformers, and meters for continuous and alternating currents. Arc lamps of seven types are hung around the laboratory, and incandescent lamps which may be used for the purposes of a rheostat.

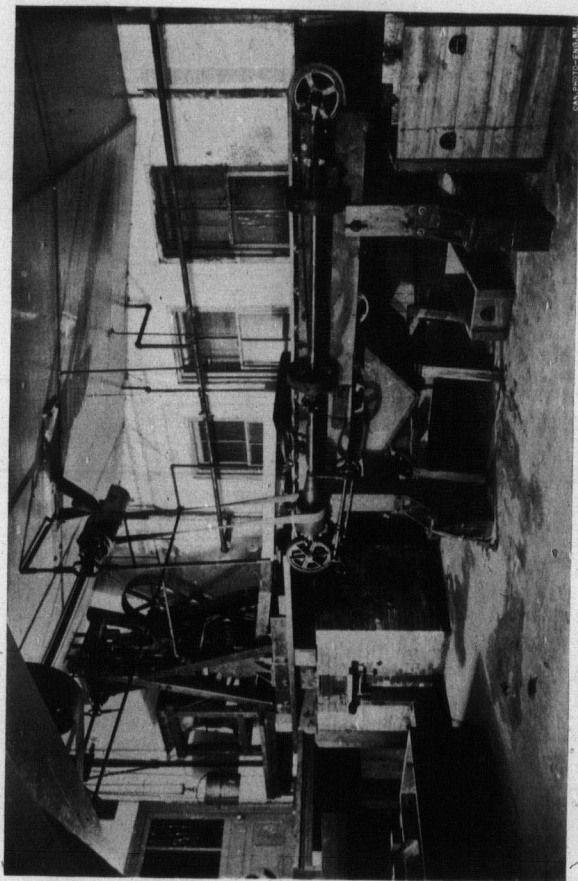
There are also a battery of Roberts' storage cells, and several chloride accumulators.

A new switchboard is to be constructed during the summer, which, in addition to affording facility for interconnection, will also carry measuring instruments which may be readily introduced into any circuit.

A Thomson balance, multicellular electrostatic voltmeter, and high potential electrostatic voltmeter, a Siemens' electro-dynamometer, and standard Weston measuring instruments furnish the means either of accurate observation or for standardization of instruments for ordinary use. These are generally used in a separate room to which connection is made.

The second section of the electrical laboratory is a room 24 by 49 ft., in another part of the basement, from which iron has as far as possible been removed. Here ten masonry piers support galvanometers, an electrometer, and other mirror reflecting instruments, and testing work can be done free from disturbing influences.

Fume cupboards and sinks have been provided for work with galvanic and storage cells; the room is also supplied with Wheatstone bridges, Kohlrausch apparatus for electrolytes, standard divided microfarad con-



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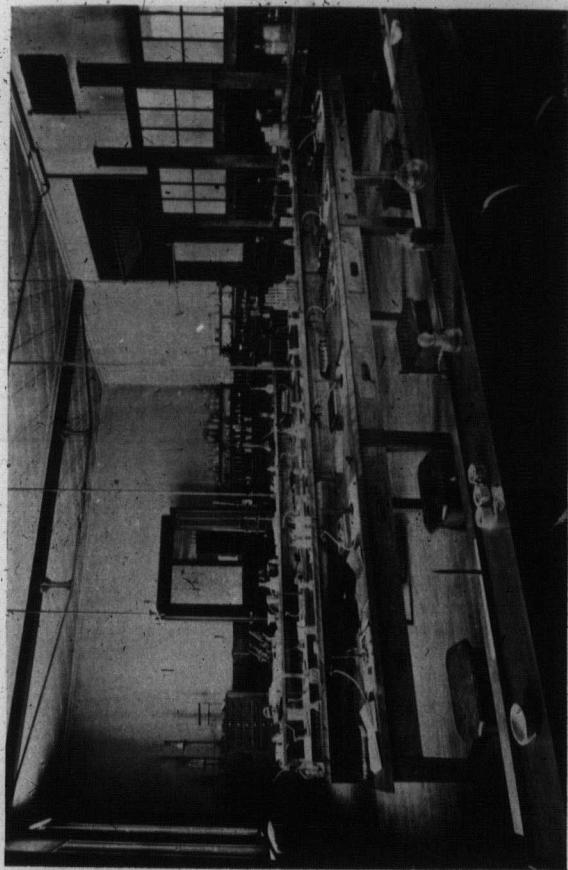
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BLOW-PIPE LABORATORY.

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denser, Clark cells, and other apparatus. Wires leading from this room to the switchboard allow measurements to be made here in connection with experiments in the other laboratory.

Connections to the 110-volt circuit of the city are accessible in all the rooms.

THE CHEMICAL LABORATORIES.

The chemical laboratories comprise a laboratory for qualitative analysis with accommodation for forty students working at one time, a laboratory for quantitative analysis capable of accommodating twenty students at a time, and smaller rooms for special work, such as water analysis, technical gas analysis, etc. The laboratories are fitted with the usual appliances.

BLOWPIPE AND ASSAYING LABORATORIES.

Six rooms are provided in this department, including a blowpipe laboratory with tables and other appliances for thirty-six students at a time; an assaying laboratory, with gas and charcoal furnaces; a balance room, titration laboratory and store-rooms, with the equipment necessary for wet and dry assays. Lithological microscopes and a lathe with all necessary facilities for the preparation and study of thin rock sections have been provided.

STAMP MILL.

A Fraser & Chalmers three-stamp mill, a Frue vanner, a Dodge crusher and other apparatus, necessary for the separation of minerals on a larger scale than in the ordinary assay laboratory, have been added to the equipment in mining. These appliances will enable a mill test of a ton or more of ore to be made, instead of an assay of a hand sample, thus affording a much more reliable index than was hitherto possible of the value of a mining property.

PHYSICAL LABORATORY.

(UNIVERSITY OF TORONTO.)

The Physical Laboratory in connection with the University of Toronto is furnished with a large collection of apparatus for lecture experiments in the departments of mechanics, sound, light, heat and electricity. It is also well supplied with instruments of precision for individual work in the

same departments. In addition to an elementary laboratory, there are several special laboratories, which offer unusual facilities for the conduct of experiments in the various branches of physics.

The electrical apparatus includes electrometers, galvanometers, resistance coils and bridges, testing keys, batteries, electrical machines (Holz and Carre), Ruhmkorff coils, Crookes' tubes, telephones, etc., etc.

MODERN LANGUAGES.

No special examinations are held in these languages except in the Fourth Year, but it is expected that every student in a regular course should be able to acquaint himself with the contents of any of the works necessary to his profession, written in these languages. Such books may be prescribed for the terminal examinations.

LIBRARY, MUSEUMS, ETC.

The Library is supplied with a number of the more important scientific and technical periodicals. A valuable collection of works of reference on the subjects of study pursued in the School has been formed and is being added to year by year.

Several thousand specimens have been procured for the museum, which now contains mineralogical, lithological, metallurgical, and palaeontological collections, affording a wide range of material for instruction in the subjects of Mineralogy, Geology and Metallurgy.

The large and valuable exhibit of minerals sent by the Ontario Government to the Columbian Exhibition at Chicago has been presented to the School.

A beginning has also been made in the collection of specimens illustrating Industrial Chemistry and Architecture.

SOCIETIES.

THE ENGINEERING SOCIETY OF THE SCHOOL OF PRACTICAL SCIENCE.

OFFICERS FOR 1895-96

<i>President</i>	G. M. Campbell.
<i>Vice-President</i>	T. D. Wright.
<i>Secretary</i>	E. Richards.
<i>Treasurer</i>	H. S. Carpenter.
<i>Corresponding Secretary</i>	W. C. Gurney.

<i>Librarian</i>	R. R. Shippe.
<i>Representatives—Graduates</i>	A. T. Laing.
<i>Fourth Year</i>	H. S. Hull.
<i>Third Year</i>	W. F. Laing.
<i>Second Year</i>	E. Andrewes.
<i>First Year</i>	R. M. Bertram.

The Society meets every second Wednesday during the Academic Year. Papers are read and discussions are held on engineering subjects. The Society subscribes for the leading engineering journals for the use of the students, and publishes a pamphlet annually, containing the best papers read before the Society.

ALUMNI ASSOCIATION OF THE SCHOOL OF PRACTICAL SCIENCE.

OFFICERS FOR 1895.

<i>President</i>	James McDougall, B. A.
<i>First Vice-President</i>	H. J. Chewett, B. A. Sc.
<i>Second Vice-President</i>	W. A. Lea, B. A. Sc.
<i>Councillors</i>	E. B. Merrill, B. A., B. A. Sc.
	T. R. Deacon, O. L. S.
	J. A. Ewart, B. A. Sc.
	A. V. White.
	S. M. Johnson, B. A. Sc.
<i>Secretary-Treasurer</i>	A. T. Laing, B. A. Sc.

Graduates are requested to keep the Secretary acquainted with their addresses.

ELECTRICAL ASSOCIATION.

OFFICERS FOR 1895-96.

<i>Honorary President</i>	H. S. Hull.
<i>President</i>	E. I. Sifton.
<i>Secretary-Treasurer</i>	H. P. Elliott.
<i>Fourth Year Representative</i>	W. M. Brodie.
<i>Third Year</i>	R. R. Lawrie.
<i>Second Year</i>	H. L. Vercoe.
<i>First Year</i>	A. G. Piper.

SESSION 1895-96.

STUDENTS IN ATTENDANCE.

FIRST YEAR.

REGULAR STUDENTS.

3. Barber, T.	3. McMichael, C.
3. Berwick, J. R.	1. McNaughton, F. D.
3. Bertram, R. M.	4. Morphy, E. J.
2. Carter, W. E.	3. Roper, W. P.
3. Collins, C. D.	1. Shaw, J. H.
3. Darling, E. H.	3. Smallpiece, F. C.
3. Fisher, A. M.	1. Smith, R.
3. Gordon, C. B.	1. Stovel, H. R.
1. Grant, W. F.	3. Tye, C. H.
1. Gzowski, C. S.	3. Williamson, D. A.
1. Kormann, J. S.	8. Wilkinson, T. A.
3. Lamb, C. M.	1. Willson, R. D.
4. Mackintosh, D.	

SPECIAL STUDENTS TAKING FULL COURSES.

3. Boyd, W. H.	2. Lea, E. P.
3. Boyd, V.	3. Little, F.
1. Bray, L. T.	3. Mackenzie, G. C.
1. Chaplin, G. W.	1. Perry, F. N.
3. Dawson, R.	3. Piper, A. G.
3. Fitzgibbons, R. G.	3. Sheldon, S.
3. Henderson, D. R.	3. Shipley, A. E.

SECOND YEAR.

3. Alexander, F. H.	1. Proudfoot, H. W.
2. Andrewes, E.	3. Richards, E.
3. Bam, J. A.	2. Robinson, A. H.
2. Bow, J. A.	4. Scott, W. F.
1. Carpenter, H. S.	3. Smillie, R.
5. Charlton, H. W.	3. Stacey, G. E.
3. Gray, A. T.	2. Stull, W. W.
3. Hicks, W. A. B.	3. Vercoe, H. L.
4. King, C. F.	1. Weekes, M.
3. Morrison, H.	1. Weldon, E. A.
1. Parker, W. G.	

THIRD YEAR.

2. Bain, J. W.	1. Laing, W. F.
2. Burwash, L. T.	3. Lawrie, R. R.
3. Campbell, G. M.	3. Macbeth, C.
2. De Cew, J. A.	3. MacMurchy, J. A.
3. Elliott, H. P.	1. Martin, T.
3. Fowler, C. P.	3. Shipe, R. R.
3. Gurney, W. C.	5. Miss E. M. Curzon.
3. Haight, H. V.	

FOURTH YEAR.

Armstrong, J.	Macallum, A. F.
Boswell, E. J.	McKinnon, H. L.
Brodie, W. M.	Mines, W.
Dobie, J. S.	Robinson, F. J.
Hull, H. S.	Tremaine, R. C. C.
McGowan, J., B.A.	

SPECIAL STUDENTS TAKING PARTIAL COURSES.

Fitzgerald, G. G.—Surveying.
Gray, J. M.—Chemistry.
Johnson, G.—Mineralogy, Geology, Assaying, and Metallurgy.
Kingsford, G. E.—Statics, Dynamics, Electricity, and Drawing.
Kitely, H.—Mineralogy.
McMillan, A. N.—Chemistry and Mineralogy.
Mollins, C. B.—Surveying.
Sanderson, A.—Electricity.
Sifton, E. J.—Electricity.
Staunton, W. J.—Chemistry.
Troup, W. J.—Mathematics, Drawing, Engineering and Surveying.
Tye, A. T.—Mining Engineering.
Webster, E. B.—Surveying.
Wright, T. D.—Mechanical and Electrical Engineering.

PRIZEMEN.

ENGINEERING.

1879.—	I. Year	J. McAree	1st prize.
1880.—	II. Year	J. L. Morris	1st prize.
1881.—	I. Year	G. H. Duggan	1st prize.
	II. Year	D. Jeffrey	1st prize.

PRIZEMEN.—Continued.

1882.—	I. Year	A. R. Raymer	1st prize.
	" "	E. W. Stern	2nd prize.
	II. Year	G. H. Duggan	1st prize.
	III. Year	D. Jeffrey	1st prize.
1883.—	I. Year	B. A. Ludgate	1st prize.
	" "	A. M. Bowman	2nd prize.
	II. Year	A. R. Raymer	1st prize.
	" "	E. W. Stern	2nd prize.
	III. Year	G. H. Duggan	1st prize.
1884.—	II. Year	B. A. Ludgate	1st prize.
	III. Year	E. W. Stern	1st prize.
	" "	A. R. Raymer	2nd prize.
1885.—	I. Year	A. F. Lott	1st prize.
	" "	J. Roger	2nd prize.
	II. Year	T. K. Thomson	1st prize.
	III. Year	B. A. Ludgate	1st prize.
1886.—	I. Year	C. H. C. Wright	1st prize.
	" "	J. E. Ross	2nd prize.
	II. Year	A. E. Lott	1st prize.
1887.—	I. Year	H. E. T. Hautain	1st prize.
	II. Year	C. H. C. Wright	1st prize.
	III. Year	A. E. Lott	1st prize.
	" "	J. Roger	2nd prize.
1888.—	I. Year	E. B. Merrill	1st prize.
	" "	F. M. Bowman	2nd prize.
	II. Year	D. D. James	1st prize.
	III. Year	C. H. C. Wright	1st prize.
1889.—	I. Year	J. K. Robinson	1st prize.
	" "	G. E. Silvester	2nd prize.
	II. Year	E. B. Merrill	1st prize.
	" "	F. M. Bowman	2nd prize.
	III. Year	D. D. James	1st prize.

PRIZEMEN.—*Continued.*

1890.—	I.	Year.....	C. Fairchild.....	1st prize.
	II.	Year.....	J. K. Robinson.....	1st prize.
	III.	Year.....	F. M. Bowman.....	1st prize.
	"	"	E. B. Merrill.....	2nd prize.
1891.—	I.	Year.....	A. J. McPherson.....	1st prize.
	"	"	R. B. Watson.....	2nd prize.
	II.	Year.....	J. B. Goodwin.....	1st prize.
	III.	Year.....	G. E. Silvester.....	1st prize.
	"	"	C. W. Dill.....	2nd prize.
1892.—	I.	Year.....	A. E. Bergey.....	1st prize.
	"	"	R. W. Angus.....	2nd prize.
	II.	Year.....	A. J. McPherson.....	1st prize.
	"	"	R. B. Watson.....	2nd prize.
	III.	Year.....	E. J. Laschinger.....	1st prize.
	"	"	C. Fairchild.....	2nd prize.

The grant for prizes was withdrawn at the close of 1892.

ARCHITECTURE.

The prize in Architecture is the gift of Mr. D. B. Dick, Architect, Toronto.

1891.—	I.	Year.....	H. Ballantyne.
1892.—	I.	Year.....	J. A. Ewart.
1893.—	I.	Year.....	A. Harkness.
1894.—	I.	Year.....	E. A. Forward.
1895.—	I.	Year.....	W. F. Scott.

GRADUATES

NOTE.—Graduates are requested to inform the Secretary of changes in their addresses.

Year.		Name.	Address.
1892..	1	Allen, T. H., B.A.Sc., Draftsman, Post & McCord	239 4th Ave., New York.
1892..	1	Allan, J. E., O.L.S.	Renfrew, Ont.
1892..	1	Anderson, A. G.	Port Dover, Ont.
1894..	3	Angus, R. W., Consulting Mechanical Engineer	Room 44, Standard Bldg., Cleveland, O.
1888..	1	Apsey, J. F., O.L.S., Resident Engineer Baltimore Belt R. R.	2125 N. Congress St., Baltimore, Md.
1893..	1	Ardagh, J. A.	Barrie, Ont.
1895..	1	Armstrong, J., School of Practical Science, Post Graduate Course	Toronto, Ont.
1888..	1	Ashbridge, W. T.	1444 Queen St. E., Toronto, Ont.
1688..	1	Ball, E. F., A.M. Can. Soc. C.E., Surveyor and Consulting Engineer	Rockvale, Colo.
1893..	4	Ballantyne, H. F., B.A.Sc., Architect	114 E. 23rd St., New York.
1891..	1	Barker, H. F.	Orillia, Ont.
1891..	1	Beatty, H. J., O.L.S.	Pembroke, Ont.
1894..	3	Beauregard, A. T., B.A.Sc., Testing Dept. General Electric Co.	Schenectady, N. Y.
1894..	1	Bergey, A. E.	Mannheim, Ont.
1893..	3	Blackwood, A. E., Fellow in Electrical Engineering, School of Practical Science	Toronto, Ont.
1886..	1	Bleakley, F. W.	Room 46, Sullivan Block, Seattle, W. T.
1895..	1	Boswell, E. J., School of Practical Science, (Post graduate course)	Toronto, Ont.
1890..	5	Boustead, W. E., B.A.Sc., Acting Demonstrator in Mineralogy, School of Practical Science	Toronto, Ont.
1886..	1	Bowman, A. M., D. & O.L.S., Staff U. S. Engineers, Ohio River Improvement.	Mahan, Beaver Co., Pa.
1890..	1	Bowman, F. M., C.E., O.L.S., Assistant Engineer, Riter & Conley	Alleghany, Pa.
1885..	1	Bowman, H. J., D. & O.L.S., A.M. Can. Soc. C.E.	Town Engineer, Berlin, Ont.
1894..	3	Boyd, D. G.	Waterous Engine Works, Brantford, Ont.
1895..	3	Brebner, G.	Sarnia, Ont.
1895..	3	Brodie, W. M., School of Practical Science (Post graduate course)	Toronto, Ont.
1888..	1	Brown, D. B., O.L.S., Mexican Southern R.	Old Mexico.
1893..	1	Brown, G. L.	Morrisburg, Ont.
1895..	3	Brown, L. L., Locomotive Dept., N.Y., N. H. & H. Ry.	New Haven, Conn.
1890..	1	Bucke, M. A.	Slocan Star Mines, Sandon, B.C.

GRADUATES.—Continued.

Year.		Name.	Address.
1894..	3	Bucke, W. A., B.A. Sc.	Royal Electric Co., Montreal, P. Q.
1883..	1	Burns, D., O.L.S., A. M. Can. Soc. C.E., Engineer's Staff, Pennsylvania Co.	Pittsburgh, Pa.
1887..	1	Burns, J. C., deceased	
1888..	1	Canniff, C. M.	City Surveyor's Office, Toronto, Ont.
1889..	1	Carey, B.	Engineer's Office, Toronto
1895..	4	Campbell, R. G.	St. Catharines, Ont.
1894..	1	Chalmers, J., Assistant Engineer, T. H. & B. Ry.	Hamilton, Ont.
1889..	1	Chalmers, W. J.	Cayuga, Ont.
1893..	1	Charleworth, L. O.	Assistant to E. Stewart, Collingwood, Ont.
1888..	1	Chewett, H. J., B.A. Sc., A. M. Can. Soc. C.E., Civil and Mining Engineer	884 York St., Toronto.
1889..	1	Clement, W. A.	City Engineer's Office, Toronto, Ont.
1895..	3	Connor, A. W., B.A.	Hamilton Bridge Co., Hamilton, Ont.
1890..	1	Corrigan, G. D., deceased	
1891..	1	Deacon, T. R., O.L.S.	Town Engineer, Rat Portage, Ont.
1891..	1	Dill, C. W.	Town Engineer, Tona- wanda, N. Y.
1895..	1	Dobie, J. S., School of Practical Science, (Post-graduate course)	Toronto, Ont.
1890..	1	Duff, J. A., B.A., Lecturer in Applied Mechanics, School of Practical Science	Toronto, Ont.
1883..	1	Duggan, G. H., M. Can. Soc. C.E., Chief Engineer, Dominion Bridge Co.	Montreal, P. Q.
1893..	1	Dunn, T. H.	Asst. to G. L. Brown, Morrisburg, Ont.
1890..	1	English, A. B.	106 Gould st., Toronto.
1894..	4	Ewart, J. A., B.A. Sc., Architect	Arnoldi & Ewart, Archi- tects, Ottawa, Ont.
1893..	1	Fairbairn, J. M. R.	Peterborough, Ont.
1892..	1	Fairechild, C., O.L.S.	Simcoe, Ont.
1893..	4	Fingland, W., Architect	307 W. 119th St., New York.
1893..	1	Forester, C.	Gormley, Ont.
1893..	1	Francis, W. J.	Asst. Engineer, Union Station, Toronto, Ont.
1890..	1	Garland, N. L.	Eghlington, Ont.
1888..	1	Gibbons, J., D. & O.L.S.	Department of the Inter- ior, Ottawa, Ont.
1893..	3	Goldie, A. R.	Assistant manager Goldie & McCulloch Co. Ltd., Galt, Ont.
1892..	1	Goodwin, J. B., B.A. Sc.	Town Engineer's Office, Niagara Falls, Ont.
1895..	1	Guernsey, F. W.	Port Hope, Ont.
1893..	3	Hanly, S. C.	A. R. Williams Machin- ery Co. Ltd., Toronto.
1889..	1	Hanning, G. F.	City Engineer's Office, Toronto, Ont.

GRADUATES—Continued.

Year.		Name.	Address.
1895..	4	Harkness, A. H.	Curry, Baker & Co., Architects, Toronto.
1889..	1	Haultain, H. E. T.	Mining Engineer Barberton, South Africa.
1885..	1	Henderson, E. E., O.L.S.	Henderson P.O., Piscataquis, Me.
1894..	3	Herald, W. J., B.A. Sc.	Hamilton, Ont.
1886..	1	Heron, E. B., D. & O.L.S.	Gordon, Hermon & Burwell, Vancouver, B.C.
1893..	3	Hall, H. S., School of Practical Science, (Post-graduate course).	Toronto, Ont.
1890..	1	Hutcheon, J., O.L.S.	City Engineer, Guelph.
1890..	1	Innes, W. L., O.L.S., C.E.	Ranney & Innes, Civil Engineers and Surveyors, Peterboro', Ont.
1889..	1	Irvine, J.	Harrison, Ont.
1889..	1	James, D. D., B.A., B.A. Sc., Engineers' Staff, N.Y.C. & H.R.R.	417 N. Division st., Buffalo, N. Y.
1891..	5	James, O. S., B.A. Sc.	191 Victoria St., Toronto.
1882..	1	Jeffrey, D.	Contractor, Stratford, Ont.
1894..	3	Job, H. E., B.A. Sc.	Kay Electric Co., Hamilton, Ont.
1894..	1	Johnson, S. M., B.A. Sc., O.L.S.	Asst. Eng'r. Trail Creek Tramway Co., Roseland, B. C.
1894..	3	Johnston, A. C., B.A. Sc.	Ontario Peat Fuel Co., Toronto, Ont.
1894..	1	Jones, J. E.	Ridgeway, Pa.
1893..	4	Keels, J., B.A. Sc., Fellow in Civil Engineering, School of Practical Science.	Toronto, Ont.
1882..	1	Kennedy, J. H., C.E., O.L.S., Architect, etc.	St. Thomas, Ont.
1884..	1	Kirkland, W. C.	Illinois Central Ry., New Orleans, La.
1893..	1	Laidlaw, J. T., B.A. Sc.	Cripple Creek, Colo.
1892..	1	Laing, A. T., B.A. Sc., Fellow in Surveying, School of Practical Science.	Toronto, Ont.
1886..	1	Laird, R., O.L.S.	14 Russell St., Toronto.
1891..	1	Lane, A., O.L.S.	Structural Dept. Maryland Steel Co., Sparrows' Point, Md.
1892..	4	Langley, C. E., Architect.	Langley & Langley, Architects, Toronto.
1892..	1	Laschinger, E. J., B.A. Sc.	Consolidated Gold Fields of South Africa, Johannesburg, South African Republic.
1893..	3	Laish, F. L.	Engineer, Sugar Factory, Boedoean, Java.
1894..	3	Laish, N. M.	Bell Telephone Co., Toronto, Ont.
1892..	5	Lawson, W., B.A. Sc., Fellow in Chemistry School of Practical Science.	Toronto, Ont.
1892..	3	Lea, W. A., B.A. Sc.	Toronto Junction St. Ry., West Toronto Junc.

GRADUATES.—Continued.

Year.		Name.	Address.
1887..	1	Lott, A. E., Railway Construction	San Antonio de la Huerta, Mexico.
1885..	1	Ludgate, B. A., O.L.S.	Denison, Texas.
1893..	1	McAllister, A. L., B.A. Sc.	Draftsman New Jersey Steel and Iron Co., Trenton, N. J.
1891..	1	McAllister, J. E., B.A. Sc. ....	.....
1893..	1	Macallum, A. F., School of Practical Science (Post-graduate course)	Toronto, Ont.
1882..	1	McAree, J., B.A. Sc., D.T.S., O.L.S., As- sayer and Surveyor	Dominion Gold Mining and Reduction Co. Ltd., Rat Portage, Ont.
1887..	1	McCullough, A. L., O.L.S., A.M. Can. Soc. C.E.	Civil and Hydraulic Eng. Galt, Ont.
1888..	1	McDowall, R., O.L.S., A.M. Can. Soc. C.E.	Owen Sound, Ont.
1884..	1	McDougall, J., H.A., County Engineer	Court House, Toronto.
1892..	1	McEntee, B., B.A. Sc.	28 Queen St. E., Toronto, Ont.
1888..	1	McFarlane, G. W., O.L.S., Assistant County Engineer	Court House, Toronto.
1893..	1	McFarlen, T. J.	10 St. Vincent st., Tor- onto, Ont.
1895..	3	McGowan, J., B.A., School of Practical Science, (Post-graduate course)	Toronto, Ont.
1885..	1	McKay, O., O.L.S.	Windsor, Ont.
1895..	3	McKay, W. N.	100 Madison ave., Toron- to, Ont.
1895..	3	McKinnon, H. L., School of Practical Science, (Post-graduate course)	Toronto, Ont.
1893..	1	McPherson, A. J., B.A. Sc.	Supt. Galt Waterworks, Galt, Ont.
1894..	1	McTaggart, A. L., B.A. Sc.	Variety Iron Works, Cleveland, O.
1893..	1	Main, W. T.	Brampton, Ont.
1888..	1	Marani, C. J., General Agent	Canada Permanent Loan Co., Vancouver, B.C.
1893..	1	Marani, V. G.	Cleveland Gas, Light & Coke Co., 49 Edgewood place, Cleveland, O.
1887..	1	Martin, F., O.L.S., M.D.	Hospital for Sick Child- ren, Toronto, Ont.
1895..	1	Meadows, W. W.	St. Thomas, Ont.
1890..	1 & 3	Merrill, E. B., B.A., B.A. Sc.	J. H. McEwen, Mfg. Co., Ridgeway, Pa.
1888..	1	Mickle, G. R., B.A., Mining Engineer, Lecturer in Mining, School of Practical Science	Toronto, Ont.
1889..	1	Mill, F. X.	268 Main St. E., Pitts- burg, Pa.
1892..	3	Milne, C. G., B.A. Sc.	Elmira Bridge Co., Elmira, N. Y.

GRADUATES.—Continued.

Year.		Name.	Address.
1893..	1	Mines, W., School of Practical Science (Post-graduate course)	Toronto, Ont.
1894..	3	Minty, W., B.A. Sc., Fellow in Mechanical Engineering, School of Practical Science	Toronto, Ont.
1892..	1	Mitchell, C. H., B.A. Sc.	Tyrrell & Mitchell, Engineers and Surveyors, Niagara Falls, Ont.
1889..	1	Moberly, H. K., Asst. Mechanical Engineer.	Youghiogheny River Coal Co., Scott Haven, Pa.
1891..	1	Moore, J. E. A., Draftsman	Riter and Conley, Alleghany, Pa.
1888..	1	Moore, J. H., O.L.S.	Smith's Falls, Ont.
1891..	1	Morris, J. L., O.E., O.L.S.	Pembroke, Ont.
1891..	1	Newman, W., O.L.S.	Windsor, Ont.
1894..	3	Nicholson, C. J.	156 George St., Hamilton.
1890..	1	Pedder, J. R., O.L.S.	Doon, Ont.
1887..	1	Pinhey, C. H., D. & O.L.S.	Soulangas Canal, Coteau Landing, P. Q.
1892..	1	Playfair, N. L.	131 Isabella st., Toronto.
1892..	1	Prentice, J. M., deceased	
1884..	1	Raymer, A. R., Asst. Division Engineer, Lake Shore and Michigan Southern R.R.	Toledo, Ohio.
1888..	1	Richardson, G. H., Divisional Eng'r. C.P.R.	Revelstoke, B. C.
1864..	1	Robertson, J., O.L.S.	Coad & Robertson, Civil Engineer, P. L. Surveyors, etc., Glencoe.
1893..	3	Robertson, J. M.	62 Admiral Rd., Toronto.
1895..	1	Robinson, F. J., School of Practical Science (Post-graduate course)	Toronto, Ont.
1891..	1	Robinson, J. K., deceased	
1887..	1	Roger, J., O.L.S.	Mitchell, Ont.
1894..	1	Rolph, H.	Pacific Rolling Mills, San Francisco, Cal.
1888..	1	Rose, K.	Mexican Southern Ry., Mexico.
1889..	1	Rosebrugh, T. R., M.A., Lecturer in Electrical Engineering, School of Practical Science	Toronto, Ont.
1892..	1	Ross, J. A., Chief Draftsman L.S. & M.S. Ry.	Toledo, O.
1888..	1	Ross, J. E., O.L.S.	Riverside, Cal.
1890..	3	Ross, R. A.	Royal Electric Co., Montreal, P. Q.
1893..	1	Russel, R., Engineer's Staff, O.A. & P.S. Ry.	Pembroke, Ont.
1891..	1	Russel, W., Engineer's Staff, O.A. & P.S. Ry.	Pembroke, Ont.
1894..	1	Shields, J. D., B.A. Sc.	78 Brunswick ave., Toronto, Ont.
1891..	1	Silvester, G. E., O.L.S.	Shiffler Bridge Co., Pittsburgh, Pa.
1892..	1	Smith, A.	Keystone Bridge Co., Pittsburg, Pa.
1894..	1	Smith, Angus	Scane & Smith, Engineers and Surveyors, Ridgetown, Ont.
1893..	1	Speller, F. N., B.A. Sc.	

GRADUATES.—Concluded.

Address.	Year.	Name.	Address.
	1894..	3 Spotton, A. K.....	Waterous Engine Works, Brantford, Ont.
	1893..	1 Squire, R. H.....	City Engineer's Office, Brantford, Ont.
	1884..	1 Stern, E. W.....	Koken Iron Works, St. Louis, Mo.
	1895..	3 Stocking, F. T.....	Waubauskene, Ont.
	1891..	1 Symmes, H. D.....	Engineer St. Ry., St. Catharines, Ont.
	1893..	1 Taylor, W. V.....	Rathbun Co., Gananoque, Ont.
	1892..	1 Thomson, R. W., B.A. Sc., Mining Engi- neer to the.....	Rand Collieries, Ltd., Brakpan, South Afri- can Republic.
	1886..	1 Thomson, T. K., C.E., A.M. Can. Soc. C.E., Consulting Engineer.....	Stamford, Conn.
	1896..	3 Tremaine, R. C. C., School of Practical Science (Post-graduate course).....	Toronto, Ont.
	1886..	1 Tyrrell, H. G., C.E.A.M. Can. Soc. C.E.....	Berlin Iron Bridge Co., East Berlin, Conn.
	1883..	1 Tyrrell, J. W., C.E., D. & O.L.S.....	42 James St. N., Hamil- ton, Ont.
	1893..	1 Watson, R. B., Chief Draftsman.....	Riter & Conley, Alleg- heny, Pa.
	1892..	3 White, A. V., Superintendent.....	Hyslop, Son, & McBurney Bicycle Works, Tor- onto, Ont.
	1889..	1 Wickett, T., M.D.....	Saunders & Wiggins.....
	1890..	1 Wiggins, T. H., O.L.S.....	Civil Engineers and Surveyors, Brockville, Ont.
	1890..	1 Withrow, W. J.....	Fetherstonhaugh & Co., Toronto, Ont.
	1888..	1 Wright, C. H. C., B.A. Sc., Lecturer in Architecture, School of Practical Science.....	524 Bathurst Street, Toronto, Ont.
	1894..	3 Wright, R. T.....	Boston St. Ry., Co., 32 E. Brooklin St., Boston, Mass.

UNIVERSITY OF TORONTO.

DEGREE OF C. E.

Date of Admission.

1895	Bowman, A. M.
1893	Bowman, F. M.
1892	Chewett, H. J.
1893	Innes, W. L.
1886	Kennedy, J. H.
1895	McAllister, J. E.
1885	Morris, J. L.
92	Thomson, T. K.
1894	Tyrrell, H. J.
1889	Tyrrell, J. W.

DEGREE B. A. SC.

Date of Admission.

1893	Alison, T. H.
1894	Ballantyne, H. F.
1895	Beauregard, A. T.
1895	Bucke, W. A.
1894	Chewett, H. J.
1895	Ewart, J. A.
1894	Goodwin, J. B.
1895	Herald, W. J.
1894	James, D. D.
1893	James, O. S.
1895	Job, H. E.
1895	Johnson, S. M.
1895	Johnston, A. C.
1894	Keele, J.
1894	Laidlaw, J. T.
1898	Laing, A. T.
1893	Laschinger, E. J.
1893	Lawson, W.
1893	Lea, W. A.
1894	McAllister, A. L.
1895	McAllister, J. E.

DEGREE OF B. A. Sc.—Continued.

Date of Admission.	
1893.....	McAree, J.
1893.....	McEntee, B.
1894.....	McPherson, A. J.
1895.....	McTaggart, A. L.
1894.....	Merrill, E. B.
1893.....	Milne, C. G.
1895.....	Minty, W.
1894.....	Mitchell, C. H.
1895.....	Shields, J. D.
1894.....	Speller, F. N.
1894.....	Squire, R. H.
1893.....	Thomson, R. W.
1893.....	Wright, C. H. C.
—————	
T. H.	
tyne, H. F.	
tyard, A. T.	
, W. A.	
tt, H. J.	
, J. A.	
win, J. B.	
d, W. J.	
s, D. D.	
s, O. S.	
H. E.	
son, S. M.	
ston, A. C.	
s, J.	
aw, J. T.	
g, A. T.	
hinger, E. J.	
son, W.	
W. A.	
llister, A. L.	
llister, J. E.	