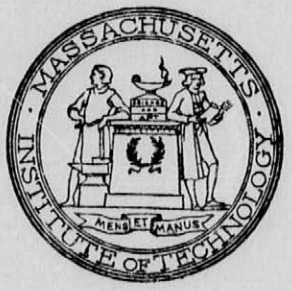
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, BOSTON.



ANNUAL CATALOGUE.

1892-1893.

PUBLICATIONS OF THE

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ANNUAL CATALOGUE issued in December, containing lists of officers and students, a full statement of the courses of instruction, a register of the graduates with their professional positions, and an account of the Lowell School of Design.

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TWENTY-EIGHTH

Special attention is called to the changes in the requirements for admission, pages 57 to 61.

A STATEMENT OF THE COURSES OF INSTRUCTION AND A REGISTER OF THE ALUMNI.

1892-1893.

BOSTON:
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1892.

MASSACHUSETTS

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TWENTY-EIGHTH

ANNUAL CATALOGUE

OF THE

OFFICERS AND STUDENTS,

WITH

A STATEMENT OF THE COURSES OF INSTRUCTION AND A REGISTER OF THE ALUMNI.

1892-1893.

BOSTON:
PRESS OF H. G. COLLINS, 15 MILTON PLACE.
1892.

CALENDAR FOR 1892–93.

School year began	Monday, Sept. 26, 1892.
Second term begins	Tuesday, Jan. 31, 1893.
Degrees conferred	Tuesday, May 30, 1893.
First Entrance Examinations	Thursday, June 29, 1893, and Friday, June 30, 1893.
Examinations for Advanced Standing	Wednesday, Sept. 13, 1893.
Second Entrance Examinations *	Tuesday, Sept. 19, 1893, and Wednesday, Sept. 20, 1893.
School year of 1893–94 will begin	Monday, Sept. 25, 1893.

CALENDAR FOR 1893–94.

School year will begin	Monday, Sept. 25, 1893.
Second term will begin	Tuesday, Jan. 30, 1894.
Degrees conferred	Tuesday, May 29, 1894.
First Entrance Examinations	Thursday, June 28, 1894, and Friday, June 29, 1894.
Examinations for Advanced Standing	Wednesday, Sept. 12, 1894.
Second Entrance Examinations *	Tuesday, Sept. 18, 1894, and Wednesday, Sept. 19, 1894.
School year of 1894–95 will begin	Monday, Sept. 24, 1894.

Stated Meetings of the Corporation	Oct. 12 and Dec. 14, 1892, March 8 and May 26, 1893.
Stated Meetings of the Executive Committee of the Corporation	First and third Tuesdays of every Month.

* See page 57.

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

HISTORICAL SKETCH.

Foundation. — The foundation of the Massachusetts Institute of Technology was laid in a report by Prof. William B. Rogers, entitled "Objects and Plan of an Institute of Technology, including a Society of Arts, a Museum of Arts, and a School of Industrial Science." A charter for the institution thus projected was granted by the Legislature of Massachusetts in an Act dated April 10, 1861. The threefold plan embodied in this charter was that outlined by Professor Rogers, who became the first President of the Institute of Technology.

The School of Industrial Science, developed along the lines indicated at its foundation, has become the prominent feature of the work of the Institute; and, indeed, nearly all persons know this, and this alone, as the Institute. The School was opened in February, 1865, with twenty-seven pupils. It is devoted to the investigation and teaching of science as applied to the various engineering professions; namely, civil, mechanical, mining, electrical, chemical, and sanitary engineering, as well as to architecture, chemistry, metallurgy, biology, physics, and geology. A course of a less technical nature, designed as a preparation for business callings, is also provided.

A subsidiary school, known as the LOWELL SCHOOL OF PRACTICAL DESIGN, is maintained by the Corporation of the Institute. A statement of its scope and organization will be found on page 183.

The Society of Arts held its first meeting on April 8, 1862. Its objects are to awaken and maintain an interest in the practical

applications of the sciences, and to aid in their advancement. Meetings are held semi-monthly from October to May, at which reports of inventions, discoveries, and matters of scientific and technical interest are presented. The "Technology Quarterly," including the proceedings of the Society and papers presented at its meetings, is regularly published. All communications concerning the Society should be addressed to the Secretary of the Society of Arts, Massachusetts Institute of Technology.

Buildings. — The buildings now occupied are, the Rogers Building, on Boylston Street, devoted to instruction in mathematics, literature, history, political science, geology, mineralogy, and biology; the Walker Building, at the corner of Boylston and Clarendon Streets, mainly devoted to the departments of chemistry, physics, and electricity, and to instruction in language; the Engineering Building, on Trinity Place, devoted to the engineering laboratories and to instruction in mechanics and hydraulics, and in mechanical and civil engineering; a series of Workshops, on Garrison Street, with a room devoted to the Lowell School of Design; a Gymnasium and Drill-hall, on Exeter Street. In order to provide increased facilities for the departments of Architecture, Physics, and Chemistry, an Architectural Building, adjoining the Engineering Building, has recently been erected, and is now occupied by the first-named department. The rooms thus released in the Walker Building meet the urgent needs of several other departments.

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THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY provides an extended series of scientific and technical studies, and of practical exercises in immediate application of the principles and technical rules acquired in the recitation and lecture room.

Central and fundamental in its curriculum are thorough introductory courses in mathematics, chemistry, and physics. The general scientific training thus acquired prepares the student, on the one hand, for more advanced scientific study of mathematics, of theoretical and organic chemistry, of heat and electricity, of physical geography, lithology, geology, and mineralogy, or of biology, botany, zoölogy, and palæontology. On the other hand, it constitutes the foundation for the technical courses in applied mechanics, in analytical, industrial, and sanitary chemistry, in electricity, in highway and railroad engineering, in engineering and architectural design and construction, in thermo-dynamics, locomotive, mill, and marine engineering, in mining, metallurgy, and assaying, and in sanitary, hydraulic, and bridge engineering.

These subjects have been arranged in twelve distinct "Courses," each of four years' duration. For the satisfactory completion of any one of these, the degree of Bachelor of Science is conferred by the Institute. Of the twelve courses, seven give their students scientific and practical training for the various engineering professions; four others, in Chemistry, Physics, Biology, and Geology, with a larger proportion of pure science, afford preparation either for professional practice, for teaching, or for scientific investigation. The Course in General Studies combines thorough general scientific training with a wide range of philosophic studies. While the Institute of Technology is primarily and essentially a school of industrial science, its curriculum has always comprised a certain, not inconsiderable, amount of literary, historical, and economic study. There has been no time since the foundation of the Institute when its degree could be attained without studies in these lines carried

through at least three years. Of late years the instructing staff on this side of the school has been strengthened, and the general course correspondingly developed.

For detailed statements in regard to the several courses, see pages 27 to 53.

Schedules and Descriptions of the Courses. — The following pages contain schedules showing the distribution of studies throughout each of the regular courses. Each schedule is preceded by a brief description.

Choice of Courses.* — The entire first year has heretofore been the same for all courses, containing subjects considered essential as preliminary training, or as a foundation for the more strictly professional studies of the later years. Commencing with the present year, however, the regular student at the end of the first half-year selects, subject to the approval of the Faculty, the course which he will thenceforth pursue, and his work becomes more specialized thereafter as it progresses. The Faculty have been led to this important departure from the previous custom of the Institute, on the one hand in order to enlist at an earlier period the student's interest in introductory professional work, on the other hand in order to meet the demands of the different departments for additional time, consequent upon their enlarged facilities for advanced technical instruction.

An idea of the nature and amount of the work to be done in any one of the regular courses may be obtained by considering, in connection with the schedule of that course (pages 29 to 53), the statements made in regard to the various branches of study (for example, Mathematics, Language, Chemistry, Physics, etc.) in the paragraphs descriptive of the "Subjects and Methods of Instruction," pages 67 to 101, and by referring at the same time to the "Schedule of Topics," pages 102 to 130. The numbers in the course schedules correspond with those in the first column of the "Schedule of Topics."

Options. — Within most of these regular courses the student is given, by means of options, a considerable latitude in the selection of

* A special circular in regard to the choice of courses will be sent on application.

the branch of his intended profession to which he will specially devote his energies in the later years of his study. Thus in Civil Engineering, page 29, he may elect Sanitary and Hydraulic Engineering, Geodesy, or an advanced course in Railroad Engineering and Management; in Mechanical Engineering, page 31, he may choose either Marine Engineering, Locomotive Construction, Mill Engineering, or Naval Architecture; and similarly for other courses. Inspection of the course descriptions and schedules, pages 28 to 53, will show the nature and effect of the options. In cases where numbers are prefixed, the selection of later options is positively determined by that of earlier ones, owing to the requirement of certain subjects as preparation for the former; in others, a wide choice is offered throughout all the years, the difference in this respect arising largely from the nature of the topics involved. In all cases the necessary sequence of subjects may be determined by consulting the Schedule of Topics, pages 102 to 130.

Graduate Courses of study may be pursued either with or without reference to advanced degrees. (See page 54.)

Five-Year Courses. — Students purposing to take the degree of the Institute, but for exceptional reasons finding it advantageous to undertake fewer studies at once than are prescribed in the schedules for the regular four-year courses, may pursue a course arranged to distribute the entire work over five instead of four years. A further statement of the five-year courses may be found on page 54.

Subjects and Methods of Instruction. — The statements on pages 67 to 101 supply a general outline of the character and methods of instruction given, and of the equipment of the laboratories, museums, and libraries, which form conspicuous features in the work of the Institute.

The Schedule of Topics gives information as to the nature, number, and period of occurrence of exercises in any particular subject, the name of the instructor, and the preparation required

for admission to exercises. This is particularly of service to the regular student in selecting options, and to the special student in affording the means of ascertaining precisely what instruction is given in any topic which he may desire to pursue, when, at what length, and by whom it is treated, and what preparation will be demanded of every applicant. By careful consultation of this schedule the special course may be so planned that the earlier studies shall afford suitable preparation for the more advanced work towards which the course is directed. (See page 102.) The numbers in the left-hand column of the schedule correspond with those in the several course schedules, pages 27 to 53.

SCHEDULES OF FIRST-YEAR STUDIES IN THE REGULAR COURSES.

FIRST TERM.

(Common to all Courses.)

	Number
Solid Geometry	21
Algebra	20
General Chemistry / Chemical Laboratory	240
Rhetoric and English Composition	120
French (or German)	151 (161)
Mechanical Drawing	70
Freehand Drawing	80
Military Drill.	

SECOND TERM.

Courses I. and II.

Plane and Spherical Trigonometry	22
General Chemistry; Qualitative Analysis. / Chemical Laboratory	241
Political History since 1815	180
French (or German)	151 (161)
Mechanical Drawing and Descriptive Geometry	71
Freehand Drawing	81
Military Drill.	

Course IV.

Plane and Spherical Trigonometry	22
Political History since 1815	180
French (or German)	151 (161)
Mechanical Drawing and Descriptive Geometry	72
Freehand Drawing	82
Military Drill.	

Course VII.

Plane Trigonometry; Elements of Analytic Geometry	23
General Chemistry; Qualitative Analysis / Chemical Laboratory	242
Political History since 1815	180
French (or German)	151 (161)
Mechanical Drawing	74
Freehand Drawing	81
Microscopy	603
Military Drill.	

Courses III., VI., X., and XI.

Plane and Spherical Trigonometry	22
General Chemistry; Qualitative Analysis / Chemical Laboratory	242
Political History since 1815	180
French (or German)	151 (161)
Mechanical Drawing and Descriptive Geometry	71
Freehand Drawing	81
Military Drill.	

Courses V., VIII., XII.

Plane and Spherical Trigonometry	22
General Chemistry; Qualitative Analysis / Chemical Laboratory	242
Political History since 1815	180
French (or German)	151 (161)
Mechanical Drawing	73
Freehand Drawing	81
Military Drill.	

Course IX.

Plane Trigonometry; Elements of Analytic Geometry	23
Political History since 1815*	180*
French	151
French (sight reading)	152
Logic and Argumentative Composition	121
Mechanical Drawing; Chart and Map Making	74
Freehand Drawing	81
Military Drill.	

For descriptions of the methods, etc., used in the above instruction, see pages 67 to 76, and page 100.

Note. — The numbers opposite the various subjects in the course schemes are those of the corresponding titles in the Schedule of Topics, pages 102 to 131, to which reference may thus be easily made for further details.

* With additional work in General History.

I. — CIVIL ENGINEERING.

This course is designed to give the student a sound training, both theoretical and practical, in the sciences and principles upon which the practice of civil engineering is based. Particular care is taken to enforce the practical application of the principles taught, and the student is made familiar with engineering instruments and with the problems of frequent occurrence.

To meet the rapid specialization now going on in the various departments of civil engineering, the department offers, in the fourth year, which is devoted mainly to professional work, three options or lines of study: namely, a general option in civil engineering; an option in which more than usual attention is devoted to highways, railroads, and railroad management; and an option giving special attention to geodesy and topography.

The more purely professional work is divided as follows: — in the second year a course is given in surveying and topographical drawing, embracing the use of the more common instruments, with practice in the field and in the drawing-room. In the third year, instruction and field practice are given in railroad surveying, and in advanced surveying; also courses in railroad and highway engineering, in stereotomy, and in the elements of structures. In the fourth year, the instruction includes the theory of structures, graphical statics, strength of materials, theoretical hydraulics, hydraulic, sanitary, and railroad engineering, railroad management, and geodesy. Practice is given in hydraulic measurements and in testing materials of construction in the engineering laboratory. Students in this course also receive instruction in mechanism, and in machinery and motors.

In the summer vacation following the third year, four weeks are devoted to a course of field-work in geology, topography, geodesy, and hydraulics, open to all students, and required of those taking the geodetic option.

Descriptions of the methods and nature of instruction in the several professional topics will be found on pages 80 to 84.

I. — CIVIL ENGINEERING.

FIRST YEAR. SEE PAGE 27.

SECOND YEAR.

FIRST TERM.

	Number
Surveying and Plotting	360
Topographical Drawing	362
Descriptive Geometry	75
Elements of Astronomy	363
Analytic Geometry	27
Physics	300
English Literature	125
American History	181
German (or French)	160 (150)

SECOND TERM.

	Number
Surveying and Plotting	360
Differential Calculus	29
Physics	300
Physical Geography	560
English Literature and Composition	125
German (or French)	160 (150)
Mechanism	430

THIRD YEAR.

FIRST TERM.

Railroad and Highway Engineering	372, 373
Stereotomy	375
Advanced Surveying	370
Integral Calculus	32
General Statics	51
Physics: Heat	310
Physical Laboratory	311
Structural Geology	565
German (or French)	161 (151)
Political Economy	205
Business Law	235

SECOND TERM.

Railroad and Highway Engineering	372, 373
Advanced Surveying	370
Theory of Structures	376
Physical Laboratory	311
Stratigraphic Geology	569
German (or French)	161 (151)
Strength of Materials; Kinematics and Dynamics	52
Business Law	235
Political Economy and Industrial History	205

FOURTH YEAR.

FIRST TERM.

Theory of Structures		394
Bridges and Similar Structures		397
Hydraulics		390
Strength of Materials; Theory of Elasticity		56
Elements of Dynamo Machinery,		340
Options.		
1.	Sanitary and Hydraulic Engineering	392
	Bridge Design	398
	Hydraulic Measurements	393
	Metallurgy of Iron	487
	Elements of Practical Astronomy	388
2.	Railroad Engineering	335, 385
	Railroad Management	386
	Metallurgy of Iron	487
	Bridge Design	398
3.	Method of Least Squares	42
	Geodesy and Astronomy	387
	Physical Laboratory	326
	Hydraulic Measurements	393

SECOND TERM.

Theory of Structures		394
Bridges and Similar Structures		397
Thesis.		
Options.		
1.	Hydraulic Engineering	401
	Machinery and Motors	60
	Elements of Geodesy	388
	Bridge & Sanitary Design,	398, 404
	Engineering Laboratory	402
	Sanitary Science and the Public Health	629
2.	Railroad Engineering	385
	Machinery and Motors	60
	Engineering Laboratory	402
	Building Construction	540
	Bridge and Railroad Design	398, 403
3.	Hydraulic Engineering	401
	Geodesy	387
	Laboratory and Field-work.	
	Differential Equations	43

II. — MECHANICAL ENGINEERING.

The course aims to equip the student with such training in pure and applied mathematics as shall qualify him to deal with the engineering problems of his profession from the most favorable standpoint. It attempts by instruction, both theoretical and practical, to acquaint him with engineering practice, and to give him a proper groundwork upon which to base a professional career. The more strictly professional work of the course may be classified as follows : —

Mathematics, physics, and applied mechanics, given outside the department ; the last including the study of, and practice in testing the strength of materials.

Recitation-room work of the department proper, beginning with the study of mechanism, the construction of gear-teeth, etc., and continued by courses on machine tools and cotton machinery. Courses are given on valve gears, thermodynamics, theory of the steam-engine, and on steam-boilers. The fourth-year instruction includes applied dynamics, further study of steam engineering, hydraulics and hydraulic motors, and a course in machine design which is partly study and partly drawing. The option is given of courses in locomotive construction, mill engineering, marine engineering, and naval construction.

Drawing-room work. The students in the second year make working drawings from measurements, and the drawings necessary in connection with the course in mechanism and gear construction. In the third year they make detail and assembly drawings from machinery, and this is followed by mechanism designs and boiler drawings.

Shop-work, including carpentry, pattern-making, forging, chipping, filing, and machine-tool work.

Engineering laboratory work. This begins with drill in steam-engine tests in the second term of the third year, and is continued throughout the fourth year, including tests of boilers, pumps, power, etc., and a large amount of investigation. (See pages 84 and 88.)

II.—MECHANICAL ENGINEERING.

FIRST YEAR. SEE PAGE 27.

SECOND YEAR.

FIRST TERM.	Number	SECOND TERM.	Number
Principles of Mechanism	420	Mechanism: Gear-Teeth; Machine Tools; Cotton Machinery,	427
Drawing	422	Drawing	423
Carpentry and Wood-turning	98	Pattern Work	99
Analytic Geometry	27	Differential Calculus	29
Descriptive Geometry	75	Physics	300
Physics	300	English Literature and Composition	125
English Literature	125	German (or French)	160 (150)
American History	181		
German (or French)	160 (150)		

THIRD YEAR.

FIRST TERM.		SECOND TERM.	
Steam Engineering; Valve Gears; Thermodynamics	433	Steam Engineering; Boilers	433
Drawing	438	Drawing, Design, and use of Surveying Instruments	438, 371
Forging	100	Engineering Laboratory	443
Integral Calculus	32	Forging; Chipping and Filing,	101, 103
General Statics	51	Strength of Materials; Kinematics and Dynamics	52
Physics: Heat	310	Physical Laboratory	311
Physical Laboratory	311	English Composition	135
German (or French)	161 (151)	German (or French)	161 (151)

FOURTH YEAR.

FIRST TERM.		SECOND TERM.	
Steam Engineering	450	Hydraulic Motors*	400
Hydraulics	391	Engineering Laboratory	455
Dynamics of Machines	451	Machine-Tool Work*	105
Machine Design*	453	Strength and Stability of Structures; Theory of Elasticity	59
Engineering Laboratory	455	English Composition	136
Chipping and Filing; Machine-Tool Work*	104, 105	Thesis.	
Strength of Materials; Friction	57		
Metallurgy of Iron	487		
Heating and Ventilation*	338		
Elements of Dynamo Machinery,	340		
Options.		*Options.*	
1. Marine Engineering	461	1. Marine Engineering	461
2. Locomotive Construction	460	2. Locomotive Construction	460
3. Mill Engineering	462	3. Mill Engineering	462
4. Naval Architecture	454	4. Naval Architecture	454

* Not taken in Option 4.

III. — MINING ENGINEERING AND METALLURGY.

The mining and metallurgical professions may be approached along any one of several distinct lines, according to the direction the student intends ultimately to pursue. The course is accordingly arranged with four options. (Options 3 and 4 are placed for convenience on page 35.)

In the second year of all four options, instruction in blowpipe silver assay, in mineralogy and blowpipe analysis, introduces the student to the professional work of his course. In the third year of three of the options, these subjects are succeeded by courses in geology, mining engineering, and assaying. In the fourth year, all the options include courses in mining engineering, in metallurgy with particular attention to the metallurgy of iron, and in metallurgical or mining laboratory work. Memoirs on special professional topics are presented by the students. In all four options, the study of mathematics and applied mechanics is continued through three and a half years.

The distinctive characteristics of the several options are, briefly, these : —

The first option is a mining engineering course, with a series of mechanical engineering subjects, leading the student towards the position of coal or iron engineer. This series includes mechanism, thermodynamics, steam engineering, and hydraulics, with drawing and laboratory work.

The second is also a mining engineering option, in which, however, civil engineering subjects are introduced — surveying and topographical drawing, railroad engineering, the theory of structures, hydraulics, and hydraulic engineering — to meet the needs of students looking forward to employment as engineers of hydraulic mining, surveyors of mines, as consulting or constructing mining engineers.

III.—MINING ENGINEERING AND METALLURGY.

OPTIONS 1 AND 2.

FIRST YEAR. SEE PAGE 27.

SECOND YEAR.

FIRST TERM.

	Number
Analytic Geometry	27
Physics	300
German (or French)	160 (150)
English Literature	125
American History	181
Descriptive Geometry	75
Blowpipe Silver Assay	480
Options.	
1. Principles of Mechanism	420
1. Use of Surveying Instruments	361
2. Surveying and Plotting	360
2. Topographical Drawing	362

SECOND TERM.

	Number
Differential Calculus	29
Physics	300
German (or French)	160 (150)
English Literature and Composition	125
Mineralogy and Blowpipe Analysis	561
Options.	
1. Mechanism: Gear-Teeth; Machine Tools	428
1. Drawing	424
1. Physical Geography (elective)	560
2. Surveying and Plotting	360
2. Physical Geography	560

SUMMER COURSE IN PRACTICAL MINING OR METALLURGY (ELECTIVE).
FIELD-WORK IN MINERALOGY (ELECTIVE).

THIRD YEAR.

FIRST TERM.

Integral Calculus	32
General Statics	51
Physics; Heat	310
Physical Laboratory	311
German (or French)	161 (151)
Mining Engineering	481
Structural Geology	566
Options.	
1. Steam Engineering; Valve Gears; Thermodynamics,	434
1. Drawing	439
2. Railroad and Highway Engineering; Field-work and Drawing	372, 373

SECOND TERM.

Strength of Materials; Kinematics and Dynamics	52
Physical Laboratory	311
German (or French)	161 (151)
Assaying	482
Mining Engineering	481
Historical Geology	568
Options.	
1. Steam Engineering; Boilers,	434
1. Engineering Laboratory	443
2. Railroad and Highway Engineering; Field-work and Drawing	372, 373

SUMMER COURSE IN PRACTICAL METALLURGY OR MINING (ELECTIVE).

FOURTH YEAR.

FIRST TERM.

Metallurgy (non-ferrous)	488
Metallurgy of Iron	487
Mining Engineering	493
Elements of Dynamo Machinery	340
Memoirs (English Criticism)	495 (137)
Mining Laboratory	489
Options.	
1. Strength of Materials; Friction	57
1. Steam Engineering and Hydraulics	450, 391
1. Engineering Laboratory	456
2. Strength of Materials; Theory of Elasticity	56
2. Theory of Structures	395
2. Hydraulics	390
2. Hydraulic Measurements	393

SECOND TERM.

Metallurgy (non-ferrous)	494
Mining Laboratory	489
Memoirs (English Criticism)	495 (137)
Thesis.	
Options.	
1. Strength and Stability of Structures; Theory of Elasticity	59
1. Technical Machinery	463
1. Engineering Laboratory	456
2. Theory of Structures	395
2. Electro-Motors	343
2. Hydraulic Engineering	401

The third option takes the direction of metallurgical engineering with nearly the same mechanical engineering work as in the first option, but with a considerable amount of chemistry. The student may look forward to superintendence of metallurgical works, in particular of iron or steel works.

Option four is a general mining and metallurgical course adapted to the needs of students who prefer not to make an immediate choice between professional specialties. It thus includes, in addition to the work in mining and metallurgy, milling and smelting, courses in geology, chemistry, and surveying.

In each option, valuable opportunities are offered for observation and field-work in the summer schools of mining and metallurgy, and in mineralogical excursions, as well as in the ample laboratories of the school. (See pages 91 to 93.)

III. — MINING ENGINEERING AND METALLURGY.

OPTIONS 3 AND 4.

FIRST YEAR. SEE PAGE 27.

SECOND YEAR.

FIRST TERM.

	Number
Analytic Geometry	27
Physics	300
German (or French)	160 (150)
English Literature	125
American History	181
Theoretical Chemistry	245
Options.	
3. Descriptive Geometry	75
3. Principles of Mechanism	420
3. Blowpipe Silver Assay (Elective)	480
4. Surveying and Plotting	360
4. Topographical Drawing	362
4. Blowpipe Silver Assay	480

SECOND TERM.

	Number
Differential Calculus	29
Physics	300
German (or French)	160 (150)
English Literature and Composition	125
Mineralogy and Blowpipe Analysis	561
Options.	
3. Mechanism: Gear-Teeth; Machine Tools	428
3. Drawing	424
4. Surveying and Plotting	360
4. Physical Geography	560

SUMMER COURSE IN PRACTICAL MINING OR METALLURGY (ELECTIVE).
FIELD-WORK IN MINERALOGY (ELECTIVE).

THIRD YEAR.

FIRST TERM.

	Number
Integral Calculus	32
General Statics	51
Physics: Heat	310
Physical Laboratory	311
German (or French)	161 (151)
Qualitative Analysis (lectures and laboratory)	251
Options.	
3. Steam Engineering; Thermodynamics; Valve Gears	434
3. Drawing	439
4. Mining Engineering	481
4. Structural Geology	566

SECOND TERM.

	Number
Strength of Materials; Kinematics and Dynamics	52
Physical Laboratory	311
German (or French)	161 (151)
Assaying	482
Quantitative Analysis (lectures and laboratory)	260
Options.	
3. Steam Engineering; Boilers	434
3. Engineering Laboratory	443
4. Mining Engineering	481
4. Historical Geology	568
4. Electricity	323

SUMMER COURSE IN PRACTICAL MINING OR METALLURGY (ELECTIVE).

FOURTH YEAR.

FIRST TERM.

	Number
Strength of Materials; Friction	57
Metallurgy (non-ferrous)	488
Metallurgy of Iron	487
Mining Engineering	493
Quantitative Analysis (lectures and laboratory)	274
Metallurgical Laboratory	491
Elements of Dynamo Machinery	340
Options.	
3. Hydraulics	391
3. Memoirs (English Criticism)	495 (137)
4. Electricity	323
4. Memoirs	495
4. Political Economy	205
4. Business Law	235

SECOND TERM.

	Number
Metallurgy (non-ferrous)	494
Quantitative Analysis (lectures and laboratory)	274
Metallurgical Laboratory	492
Thesis.	
Options.	
3. Engineering Laboratory	459
3. Technical Machinery	463
3. Memoirs (English Criticism)	495 (137)
4. Mining Engineering	493
4. Memoirs	495
4. Political Economy and Industrial History	323
4. Business Law	205
	235

IV. — ARCHITECTURE.

The professional work of the architectural course begins in the second year, with the study of the five orders and their applications, and of architectural history. The student is made familiar with the materials and principles of construction by lectures and visits to buildings.

In the third year, specifications are discussed and sufficient practice in working drawings is given to enable the student to be of immediate use on entering an architect's office.

A technical course in heating and ventilation is given in the fourth year, illustrated by the study of the principal public buildings in the city. In this year, also, graphical statics is applied to general practice, and exercise is given in designing trusses and in the construction of domes, arches, and buttresses.

Practice in architectural design is continued throughout the course, also instruction in drawing from the cast and from life. Facility in rendering is gained by a course in water-color and pen and ink drawing.

Throughout this course, as well as those in engineering, extends a full course in mathematics, pure and applied, to serve as a basis for professional work. Regular students pursue also courses in German, French, English, history, physics, etc.

The architectural course aims to prepare its pupils not only for their years of work as subordinates, when accuracy, rapidity, and taste in drawing and design, with knowledge of detail, will be the most useful qualifications, but also for their subsequent independent career when the value of technical knowledge will become most important.

Persons applying for admission as special students in architecture must be college graduates, or twenty-one years of age with not less than two years' office experience. They will be required to pass, before entrance, examinations* in plane geometry, and freehand and mechanical drawing (including projections and isometric) ; and must include in their work at the Institute the regular courses in freehand drawing, solid geometry, and descriptive geometry, unless already proficient in these subjects. (See page 93.)

*See "Advanced Standing Examinations," Calendar, page 2.

IV. — ARCHITECTURE.

FIRST YEAR. SEE PAGE 27.

SECOND YEAR.

FIRST TERM.	Number	SECOND TERM.	Number
Orders	510	Architectural History	516
Freehand Drawing	83	Materials	513
Shades and Shadows	511	Perspective	512
Analytic Geometry	27	Pen and Ink	515
English Literature	125	Freehand Drawing	83
American History	181	Original Design	514
German (or French)	160 (150)	Differential Calculus	29
Physics	300	English Literature and Composition	125
		German (or French)	160 (150)
		Physics	300

THIRD YEAR.

FIRST TERM.		SECOND TERM.	
Architectural History	517	Specifications and Working Drawings	520
Building Stones	565	Stereotomy	521
Specifications and Working Drawings	520	Water Color	524
Freehand Drawing	84	Freehand Drawing	84
Pen and Ink	523	Pen and Ink	523
Original Design	522	Original Design	522
Integral Calculus	32	Strength of Materials	53
General Statics	51	Political Economy and Industrial History	205
German (or French)	161 (151)	Business Law	235
Political Economy	205	German (or French)	161 (151)
Business Law	235		
Physics: Heat	310		

FOURTH YEAR.

FIRST TERM.		SECOND TERM.	
Strength of Materials	58	Sanitary Science and the Public Health	629
Advanced French	153	Advanced French	153
Heating and Ventilation	339	Graphical Statics	536
History of Ornament	531	History and Literature of the Renaissance and the Reformation	185
History and Literature of the Renaissance and the Reformation	185	Business Relations, Contracts, etc.	537
Water Color	534	History of Ornament	531
Graphical Statics	536	Modelling	539
History of Construction	530	Water Color	534
Life Class	535	Life Class	535
Original Design	532	History of Painting and Sculpture	538
		Original Design: Thesis	532

V. — CHEMISTRY.

The course in Chemistry is primarily designed to prepare students for actual work in connection with manufactures based on chemical principles. It is also adapted to the needs of persons who intend to become teachers of chemistry.

The class-room work consists of courses of lectures on general chemistry, and on theoretical, analytical, industrial, and organic chemistry. The non-chemical studies, such as mathematics, physics, mineralogy, English, history, political economy, and language, are selected with reference to their bearing on chemical work, or for their general educational value.

The student spends a large part of the four years in the laboratories, the work being arranged as follows: — In the first year there is general laboratory practice, in which the student is taught the nature of chemical processes and the use of chemical apparatus, and is drilled in accurate habits of observation. Qualitative Chemical Analysis is begun in the second term of the first year, and is continued through the first term of the second year. Quantitative Analysis follows in the second term of the second year, and continues throughout the course. Industrial, sanitary, and organic laboratory practice follow in the third and fourth years.

While there is a certain prescribed course of study and work in the separate departments of chemistry, which all regular students must pursue, great latitude in the choice of subjects is allowed in the third and fourth years.

Effort is made to develop self-reliance in the student, so that he may be fitted to make his way without assistance. To this end he is required to make investigations, involving original research and reference to the appropriate literature in English, French, and German.

The details of instruction in this course, both for regular and special students, and the description of the Kidder laboratories, are given on pages 73 to 77.

V.—CHEMISTRY.

FIRST YEAR. SEE PAGE 27.

SECOND YEAR.

FIRST TERM.	Number
Qualitative Analysis (lectures and laboratory)	246
Theoretical Chemistry	245
Physics	300
German (or French)	160 (150)
English Literature	125
American History	181
Analytic Geometry	27

SECOND TERM.	Number
Quantitative Analysis (lectures and laboratory)	255
Mineralogy and Blowpipe Analysis,	561
Physics	300
German (or French)	160 (150)
English Literature and Composition	125
Options.	
1. Differential Calculus	29
2. { Physical Geography	560
2. { Microscopy	603

THIRD YEAR.

FIRST TERM.	
Quantitative Analysis (lectures and laboratory)	271
Industrial Chemistry	266
Physics: Heat	310
Physical Laboratory	311
German (or French)	161 (151)
Political Economy	205
Business Law	235
Assaying	483
Options.	
Integral Calculus	32
Structural Geology	566
Electricity	318
Sanitary Chemistry	277
Industrial Chemical Laboratory	267

SECOND TERM.	
Quantitative Analysis (lectures and laboratory)	271
Theoretical Chemistry	265
Industrial Chemistry	266
Physical Laboratory	311
German (or French)	161 (151)
Political Economy and Industrial History	205
Business Law	235
Options.	
Electricity	319
Historical Geology	568
Sanitary Chemistry	277
Industrial Chemical Laboratory,	267

FOURTH YEAR.

FIRST TERM.	
Organic Chemistry	282
Organic Analysis	278
Physical Laboratory	325
Metallurgy	487, 488
Abstracts.	
Options.	
Physics	325
Language	154 or 162
Sanitary Chemistry	287
Textile Coloring	288
Laboratory Options.	
Analytical Laboratory	281
Organic Laboratory	285
Metallurgical Laboratory	491
Industrial Laboratory	286

SECOND TERM.	
Organic Chemistry	282
Gas Analysis	290
Optical Analysis of Sugar	292
Thesis.	

VI. — ELECTRICAL ENGINEERING.

This course is designed to meet the needs of young men desirous of entering upon the practice of any of the various applications of electricity in the arts. Its leading studies are physics, especially theoretical and applied electricity, mechanical engineering, and mathematics.

To these are added general studies in history, literature, political economy, and French and German; the latter being of importance in obtaining at first hand a prompt acquaintance with the results of invention and discovery. Of the technical studies of the course, those in mechanical engineering run parallel with the electrical subjects, since in all branches of electrical engineering a sound knowledge of mechanics and motors, of measurements of power and of means of its transmission, etc., is essential. Thus, through the second year, the students follow mathematics, mechanism, shopwork, and drawing to substantially the same extent as do those of the mechanical engineering course. In the third year, the pure and applied mathematics, mechanics, and mechanical engineering (lecture and laboratory work) are much the same in the two courses; and certain of these subjects are continued in the fourth year.

A full course in physics begins with the second year, and is continued, by lectures, recitations, and laboratory work, to the end of the third year. A portion of this is devoted to electricity; and at the close of the second year special lectures, readings, and recitations on this topic are begun, by which the study of the theory of electricity is continued until the middle of the fourth year. Work in the physical laboratory begins at the middle of the second year, and leads up to electrical measurements and testing. Extended courses on the technical application of electricity to the telegraph, telephone, electric lighting, the electrical generation and transmission of power, etc., are given, chiefly in the fourth year. Electrical study and research occupy the principal position in this year. A series of advanced mathematical topics also forms an important part of the work. (See pages 77 and 86.)

VI. — ELECTRICAL ENGINEERING.

FIRST YEAR. SEE PAGE 27.

SECOND YEAR.

FIRST TERM.	Number
Physics	300
Acoustics	302
Analytic Geometry	27
Descriptive Geometry	75
Principles of Mechanism	420
Carpentry and Metal-turning,	97, 106
English Literature	125
American History	181
German (or French)	160 (150)

SECOND TERM.	Number
Physics	300
Physical Laboratory	303
Acoustics and Electricity	302
Differential Calculus	29
Mechanism: Gear-Teeth; Machine Tools	429
Drawing	425
Carpentry and Wood-turning	97
English Literature and Composition	125
German (or French)	160 (150)

THIRD YEAR.

FIRST TERM.	
Physics: Heat	310
Physical Laboratory	313
Theoretical Electricity	315
Methods of Telegraphy	314
Integral Calculus	32
General Statics	51
Steam Engineering: Valve Gears; Thermodynamics	435
Drawing	440
Political Economy	205
Business Law	235
German (or French)	161 (151)

SECOND TERM.	
Physical Laboratory: Heat, Electricity	313
Theoretical Electricity	316
Electrical Measuring Instruments	319
Strength of Materials; Kinematics and Dynamics	52
Steam Engineering: Boilers	435
Engineering Laboratory	443
Drawing	440
Political Economy and Industrial History	205
Business Law	235
German (or French)	161 (151)

FOURTH YEAR.

FIRST TERM.	
Technical Applications of Electricity to Telephone, Electric Lighting, Electrical Generation and Transmission of Power, etc.	333, 334, 335, 336
Physical Laboratory: General Electrical Testing; Testing of Telegraph Lines, Dynamo Machines, etc.	327
Theory of Alternating Currents	332
Photometry	337
Method of Least Squares	42
Steam Engineering	450
Dynamics of Machines	452
Engineering Laboratory	457
Strength of Materials; Friction	57
Hydraulics	391

SECOND TERM.	
Technical Applications of Electricity	333, 343
Differential Equations	43
Engineering Laboratory	457
Discussion of the Precision of Measurements	342
Thesis.	

Options.

1. Quaternions	40
2. Physical Laboratory	327
3. Mathematical Theory of Electricity	341

NOTE. — The student is advised to take Advanced German.

VII. — BIOLOGY.

This course, in the earlier years, gives a broad elementary education in the natural sciences, such as chemistry, general biology, geology, botany, and mineralogy, with constant laboratory practice in each subject; and, in the later years, advanced or professional instruction in these and other subjects, especially in physiology and sanitary biology. Students of biology have full access to the unusual opportunities which the Institute now affords in the various branches of sanitary science.

In general those who graduate from this department find their places as biologists, attached to boards of health, or they become teachers or physicians. It is obvious that a course of study such as is outlined upon the opposite page fits the student thoroughly for the scientific or professional study of medicine. For this no preparation can surpass a well-considered and liberal education in which the prominent features are chemistry, physics, and biology, including bacteriology and sanitary science.

The course in Biology is also well adapted for those who wish to become teachers of natural science, a profession in which there is a steadily increasing demand in the secondary schools. Abundant opportunities for practical studies are provided in the biological, chemical, geological, and mineralogical laboratories (see page 96); while advantages somewhat unusual are offered by the library and museum of the Boston Society of Natural History. (See page 101.)

Special facilities are offered in this department for graduate students in bacteriology and sanitary biology, including the study of the organisms affecting water supply, sewage disposal, and the public health. The theory and practice of sanitary science and of the purification of water and sewage, the natural history of epidemics, and the sanitary applications of the germ theory of disease, form portions of these courses. (See page 95.)

VII. — BIOLOGY.

FIRST YEAR. SEE PAGE 27.

SECOND YEAR.

FIRST TERM.

	Number
General Biology	600
Qualitative Analysis (lectures and laboratory)	246
Physics	300
Theoretical Chemistry	245
English Literature	125
American History	181
German (or French)	160 (150)
Zoölogy	604

SECOND TERM.

	Number
Elementary Botany	606
English Literature and Composition	125
Physical Geography	560
German (or French)	160 (150)
Physics	300
Zoölogy	604
Quantitative Analysis (lectures and laboratory)	255
Mineralogy and Blowpipe Analysis	562

THIRD YEAR

FIRST TERM.

Comparative Anatomy	612
Biology of Micro-organisms	610
Structural and Chemical Geology	566
Physics: Heat	310
Physical Laboratory	311
Political Economy	205
Business Law	235
German (or French)	161 (151)
Anthropology	615
Analytical Chemistry (lectures and laboratory)	270
Freehand Drawing	85

SECOND TERM.

Comparative Anatomy and Embryology	612
Cryptogamic Botany	616
Historical Geology	568
Physical Laboratory	311
Business Law	235
Political Economy and Industrial History	205
German (or French)	161 (151)
Sanitary Chemistry	277
Freehand Drawing	85

FOURTH YEAR.

FIRST TERM.

	Comparative Physiology	620
	Microscopic Anatomy	622
	History of Natural Science	627
	Higher Biology	624
	Bacteriology	628
	Journal Club.	
	Options.	
1.	History and Literature of the Renaissance and the Reformation	185
1.	Climatology	580
2.	Organic Chemistry	282
2.	Organic Analysis	279

SECOND TERM.

	Comparative Physiology	620
	Microscopic Anatomy	622
	Sanitary Science and the Public Health	629
	Higher Biology	624
	Journals.	
	Thesis.	
	Options.	
1.	History and Literature of the Renaissance and the Reformation	185
1.	Sanitary Biology, or Social Science and History	630
2.	Organic Chemistry	282
2.	Sanitary Biology	630

VIII. — PHYSICS.

As distinguished from the professional or technical courses in engineering, architecture, etc., the Institute offers certain courses of a distinctly scientific nature. The course in Physics contains a series of studies adapted to the needs of those who wish to become teachers of physics, or who desire to enter upon a course in pure science, whether with a view to its further continuance, or wholly as a matter of training. A somewhat advanced treatment of mathematical topics, and the continuous study of physics, are its leading features. General, theoretical, analytical, and organic chemistry occupy a position next in prominence to mathematics, and of hardly less importance. Options are so arranged that choice may be made between the pursuit of more advanced mathematical and chemical topics; also between shopwork instruction in the use of tools, and work in the biological laboratory.

Historical and other allied subjects and the modern languages are continued throughout the first three years; and the latter may be further prolonged, if desired. Chemistry may be continued up to the middle of the last year, and mathematics, pure and applied, is required throughout the whole four years. Physics begins with the second year, and in lectures, readings, recitations, and laboratory exercises, extends to the close of the course. A large amount of experimental work is performed, and an experimental investigation is undertaken during the fourth year in connection with the preparation of the thesis. At all times it is sought to encourage the spirit of original research, and to impart an understanding of the principles upon which scientific investigation, especially in quantitative measurement, should be conducted. (See pages 77 to 79.)

VIII. — PHYSICS.

FIRST YEAR. SEE PAGE 27.

SECOND YEAR.

FIRST TERM.

	Number
Physics	300
Acoustics	302
Analytic Geometry	27
Qualitative Analysis (lectures and laboratory)	247
Theoretical Chemistry	245
Descriptive Astronomy	301
English Literature	125
American History	181
German (or French)	160 (150)

SECOND TERM.

	Number
Physics	300
Physical Laboratory	303
Acoustics and Electricity	302
Differential Calculus	29
Microscopy	603
English Literature and Composition	125
German (or French)	160 (150)

Options.

1.	Quantitative Analysis (lectures and laboratory)	255
2.	General Theory of Equations,	30
	Determinants	31

THIRD YEAR.

FIRST TERM.

Physics: Heat	310
Physical Laboratory	311, 312
Optics or Electricity	314, 315, 317
Integral Calculus	32
Differential Equations	35
Elements of Organic Chemistry	262
Political Economy	205
Business Law	235
German (or French)	161 (151)
Physiology of the Senses or Shopwork	614 98

Options.

1.	Quantitative Analysis	272
2.	Analytic Geometry of Three Dimensions, or Advanced Algebra and Trigonometry	38 37

SECOND TERM.

Physical Laboratory: Heat, Electricity	311, 312
Optics, Electricity, or Heat,	316, 317, 319
Analytical Mechanics	49
Theoretical Chemistry	265
Political Economy and Industrial History	205
Business Law	235
German (or French)	161 (151)

Options.

1.	Quantitative Analysis	272
2.	Advanced Calculus	39
	or Quaternions	40
	Physics	312

FOURTH YEAR.

FIRST TERM.

Physical Laboratory	327
General Physics	331
Physical Memoirs	324
Analytical Mechanics	50
Principles of Scientific Investigation	330
History of Physical Science	329
Thermodynamics.	
Photometry	337
Method of Least Squares	42

Options.

1. Organic Chemistry	280
2. Advanced Algebra and Trigonometry, or Analytic Geometry of Three Dimensions	37 38

SECOND TERM.

General Physics	331
Analytical Mechanics	50
Discussion of the Precision of Measurements	342
Thesis.	

Options.

1.	Physiological Measurements.	
2.	Quaternions or Advanced Calculus	40 39
3.	Mathematical Theory of Electricity	341
4.	Physical Research	327

IX. — GENERAL STUDIES.

This course is designed especially for those students who wish to secure an education based upon scientific study and experiment but including a larger amount of philosophical study in history, economics, language, and literature than would be consistent with the technical requirements of the other courses. It is adapted to the needs of those who expect to engage in trade, banking, or manufacturing, in journalism, or in the teaching of social or political science. It is particularly intended for those who seek administrative positions in business, where, in place of detailed technical knowledge, a more liberal training is of great advantage, and where a systematic study of political and social relations and familiarity with scientific methods and processes are alike essential.

The curriculum has been arranged in the belief that the origin, growth, and laws of political and industrial society can best be approached through the methods used in natural science. The uniform requirement of the Institute in physics and a considerable share of the general training in chemistry, are preserved in this course. From the study of biology, including botany and zoölogy, as a basis, the student is prepared to proceed to the study of man in society, and to consider the history and significance of social institutions, such as the family, the state, and the church. Physical science, biology, anthropology, social science and history, political and industrial history, and international law thus present, throughout the course, a definite progressive relationship.

Other special features of the department of General Studies are: more extended study of modern languages; a continuous course of historical study, directed especially towards the political and social history of England and the United States; drill in the essential principles of English composition and a careful study of the successive periods of English literature; an orderly study of economics, including its theory and history, with courses in industrial and commercial history and geography, finance, and statistics. The list of options is larger than in other courses, and the student may be permitted to extend this list, if his individual aptitudes justify such a liberty. (See pages 69 to 73.)

IX. — GENERAL STUDIES.

FIRST YEAR. SEE PAGE 27.

SECOND YEAR.

FIRST TERM.

	Number
Economic Problems	201
English Literature	125
French and German	153, 160
General Biology	600
Political Economy	200
Political History of England and the United States	182
Physics	300

SECOND TERM.

	Number
English Literature and Composition	125
French and German	153, 160
Physical Geography	560
Physics	300
Physical Laboratory	303
Political History of England and the United States	182
Zoölogy and Botany	605, 606

THIRD YEAR.

FIRST TERM.

Anthropology	615
Business Law	235
*Commercial Geography	211
*Financial History of United States	210
French and German	155, 161
History and Literature of the Renaissance and the Reformation	185
Physics: Heat	310
Statistics	206
Structural Geology	565

† *Options.*

History of England in the 16th and 17th Centuries.	
Economics.	
Analytic Geometry	27
English Literature to 1560	128

SECOND TERM.

Business Law	235
French and German	155, 161
Historical Geology	568
History and Literature of the Renaissance and the Reformation	185
*History of Commerce	212
Social Science and History	225

† *Options.*

History of England in the 16th and 17th Centuries.	
Political Science — Theories of Socialism and Coöperation	214
English Literature: 1560–1660	129
History of Architecture	517
Differential Calculus	29

FOURTH YEAR.

FIRST TERM.

Climatology	580
Comparative Politics	226
English Literature: 1780–1860	130
German	163
History and Elements of Philosophy	188
Physiology	626
*Taxation and Administration	215

Options.

History of Era of French Revolution	186
Local United States History	187
Political Science — Statistics of Sociology	207
Language — Special Work in French or German, or Elements of Spanish or Italian	165, 166
Contemporary English and American Literature	132
History of Architecture	517
Integral Calculus	32

SECOND TERM.

Comparative Politics	226
English Literature: 1660–1780	131
*History of Industry	213
German	163
International Law	227
Sanitary Science and the Public Health	629
Thesis.	

Options.

History of Era of French Revolution	186
Local United States History	187
Language — First Term Continued	165, 166
English Composition (advanced course)	134
Banking and Finance.	
History of Economic Theory	216

*Alternating studies.

† In this year an option in Latin Readings, with special reference to English Etymology, may be chosen by students qualified for such work.

X. — CHEMICAL ENGINEERING.

This course is arranged to meet the needs of students who desire a general training in mechanical engineering, and who wish to devote a portion of their time to the study of the applications of chemistry to the arts, especially to those engineering problems which relate to the use and manufacture of chemical products. The instruction in the fourth year has been so arranged that the student can exercise a certain choice as to the topics to which he will devote special attention. A student may receive instruction in textile coloring in case he expects to find employment in the textile industries; in heat measurements and metallurgy, to fit him especially for operations involving the use of furnaces; or in organic chemistry, if he intends to engage in the manufacture of organic products. It is expected that the graduates in this course will find employment as engineers, having to deal with problems of construction and administration in connection with dye-works and bleacheries, oil refineries, gas-works, sugar refineries, soap-works, paper and pulp mills, chemical works, and various other branches of industry where such special training is demanded; and that they will acquire sufficient knowledge to be able to work intelligently in carrying out the processes used in these establishments.

The general engineering studies in the course in Chemical Engineering coincide for the most part with the work of the students in Mechanical Engineering. A special course of instruction is given to the students of the fourth year, devoted to a discussion of the appliances used in manufacturing and applied chemistry, considered from an engineering point of view.

The instruction in industrial and applied chemistry is arranged with reference to the needs of this course, and special attention is directed to the methods of conducting the mechanical operations in the various manufacturing processes. At the same time, the chemical principles upon which operations rest are thoroughly taught. (See page 87.)

X.—CHEMICAL ENGINEERING.

FIRST YEAR. SEE PAGE 27.

SECOND YEAR.

FIRST TERM.	Number
Principles of Mechanism	420
Analytic Geometry	27
Descriptive Geometry	75
Physics	300
Qualitative Analysis (lectures and laboratory)	248
German (or French)	160 (150)

SECOND TERM.	Number
Mechanism: Cotton Machinery; Machine Tools; Gear-Teeth	427
Drawing	423
Differential Calculus	29
Physics	300
German (or French)	160 (150)
Quantitative Analysis (lectures and laboratory)	257

THIRD YEAR.

FIRST TERM.	
Steam Engineering: Thermodynamics; Valve Gears	436
Integral Calculus	32
General Statics	51
Physics: Heat	310
Physical Laboratory	311
German (or French)	161 (151)
Drawing	441
Industrial Chemistry	266
English Literature	125
American History	181
Elements of Organic Chemistry,	262

SECOND TERM.	
Steam Engineering: Boilers	436
Drawing	441
Engineering Laboratory	443
Strength of Materials; Kinematics and Dynamics	52
Physical Laboratory	311
German (or French)	161 (151)
Industrial Chemistry	266
Industrial Chemical Laboratory,	268
English Literature and Composition	125

FOURTH YEAR.

FIRST TERM.	
Steam Engineering	450
Dynamics of Machines	452
Engineering Laboratory	458
Strength of Materials; Friction	57
Metallurgy	487, 488
Political Economy	205
Applied Chemistry	289
Gas Analysis	290
Photometry	337
Shopwork	98
Business Law	235
Options.	
Textile Coloring	288
Heat Measurements	328
Organic Chemistry	282
Hydraulics and Hydraulic Measurements	391, 393

SECOND TERM.	
Engineering Laboratory	458
Strength and Stability of Structures; Theory of Elasticity	59
Technical Machinery	463
Shopwork	102, 107
Applied Chemistry: Memoirs	289
Business Law	235
Political Economy and Industrial History	205
Thesis.	
Options.	
Metallurgy	494
Industrial Chemical Laboratory	289
Organic Chemistry	282
Hydraulic Motors	400

XI. — SANITARY ENGINEERING.

This course is essentialy one in civil engineering, but is designed for students who wish to pay particular attention to those engineering branches which are concerned with problems of the public health, and who, therefore, desire to gain a better knowledge of the subjects of chemistry and biology, and of their relations to engineering problems, than can be obtained in the course in Civil Engineering.

The line of study offered differs from the regular course in Civil Engineering, page 28, in the following particulars: —

There is a reduction in the time devoted to railroads and bridges, and an entire omission of the mechanical engineering subjects of mechanism and machinery and motors, and of astronomy, metallurgy of iron, and historical geology.

The time thus gained is devoted principally to courses in chemistry and biology. In these it is designed to give the students such training as shall fit them to interpret properly the results of researches in sanitary chemistry and sanitary biology, and to co-operate with chemists and biologists in professional work. Practice is given in the chemical and biological laboratories, and the student is instructed in the methods of water and air analysis, and is taught to observe and identify the various animal and vegetable organisms present in natural waters and sewage. The course devotes particular attention to the sanitary side of questions of water supply and drainage, and discusses, among other things, the principles of filtration and the methods of purifying water and sewage, the relation between drinking waters and disease, the methods of disposing of sewage, and other questions relating to the health of communities. In the fourth year a course of instruction is also given in heating and ventilation.

The entire instruction in sanitary and hydraulic engineering now given in the course in Civil Engineering, a portion of which is there optional, is required in the course in Sanitary Engineering. (See pages 80 and 95.)

XI. — SANITARY ENGINEERING.

FIRST YEAR. SEE PAGE 27.

SECOND YEAR.

FIRST TERM.	Number	SECOND TERM.	Number
Surveying and Plotting	360	Surveying and Plotting	360
Topographical Drawing	362	Differential Calculus	29
Descriptive Geometry	75	Physics	300
Analytic Geometry	27	Physical Geography	560
Physics	300	English Literature and Composition	125
English Literature	125	German (or French)	160 (150)
American History	181	Qualitative Analysis (lectures and laboratory)	250
German (or French)	160 (150)		
Elements of Organic Chemistry	262		

THIRD YEAR.

FIRST TERM.		SECOND TERM.	
Railroad and Highway Engineering	372, 374	Railroad and Highway Engineering	372, 374
Stereotomy	375	Advanced Surveying	370
Advanced Surveying	370	Theory of Structures	376
Integral Calculus	32	Physical Laboratory	311
General Statics	51	German (or French)	161 (151)
Physics: Heat	310	Strength of Materials; Kinematics and Dynamics	52
Physical Laboratory	311	Water Analysis	277
Structural Geology	565	Microscopy	603
German (or French)	161 (151)	Political Economy and Industrial History	205
Political Economy	205	Business Law	235
Business Law	235		
Quantitative Analysis (lectures and laboratory)	259		
General Biology	601		

FOURTH YEAR.

FIRST TERM.		SECOND TERM.	
Theory of Structures	396	Theory of Structures	396
Hydraulics	390	Hydraulic Engineering	401
Hydraulic Measurements	393	Design	404
Strength of Materials; Theory of Elasticity	56	Engineering Laboratory	402
Sanitary and Hydraulic Engineering	392	Chemistry of Natural Waters	291
Bridge Design	399	Theories of Water Purification and Sewage Disposal	631
Air Analysis	284	Sanitary Science and the Public Health	540
Bacteriology	628	Building Construction	629
Biology of Micro-organisms	611	Sanitary Biology	540
Heating and Ventilation	339	Thesis.	630

XII. — GEOLOGY.

The course affords an opportunity to obtain a general education in natural science with special training in geological work and studies. The occupations which its students may naturally have in view include employment in responsible positions upon local, state, or national surveys, practice as professional geologists in any of the economic or technical relations of the science, or connection with collegiate or other institutions requiring instruction in geological studies.

Modern methods of conducting government and other surveys have increased the demand for men who can represent topographically, as well as interpret geologically, the physical features of a country. With the intention of educating students for such work, a larger amount of topographic, geodetic, and hydrographic surveying is introduced than is common in geological courses. To these and to the general geologic studies there are also added the construction of geologic maps and sections, physiographic geology and hydrography with field practice.

By the study of economic geology, ore-deposits, mineralogy and lithology, chemistry and assaying, together with the mining and metallurgy which may be elected, the student is prepared to apply his geological knowledge to regions of mineral wealth and their development.

It is recognized that students preparing to teach, and others, may, for good reasons, desire an arrangement of studies differing somewhat from that offered, as, for example, in the substitution of natural history studies for those in civil engineering. Applications for such substitution will be entertained by the Faculty.

For details of instruction and equipment, see pages 97 to 100.

XII.—GEOLOGY.

FIRST YEAR. SEE PAGE 27.

SECOND YEAR.

FIRST TERM.	Number	SECOND TERM.	Number
Analytic Geometry	27	German (or French)	160 (150)
German (or French)	160 (150)	English Literature and Composition	125
English Literature	125	Physics	300
American History	181	Surveying and Plotting	360
Physics	300	Mineralogy and Blowpipe Analysis	562
Surveying and Plotting	360, 362	Physical Geography	560
Qualitative Analysis (lectures and laboratory)	249	Quantitative Analysis (lectures and laboratory)	258
Theoretical Chemistry	245		

FIELD-WORK IN MINERALOGY (ELECTIVE).

THIRD YEAR.

FIRST TERM.	SECOND TERM.
German (or French) . . 161 (151)	German (or French) . . 161 (151)
Political Economy . . . 205	Political Economy and Industrial History 205
Business Law 235	Business Law 235
Physics: Heat 310	Physical Laboratory . . . 311
Physical Laboratory . . . 311	Topographical Surveying . . 370
Topographical Surveying . . 370	Historical Geology . . . 568
Structural and Chemical Geology 566	Mineralogy 570
Geological Field-Work . . 567	Geological Maps and Sections . 571
Quantitative Analysis (lectures and laboratory) . . . 273	Quantitative Analysis (lectures and laboratory) . . . 273
General Biology 602	Systematic Botany . . . 606
Zoölogy 604	Zoölogy 604
Palæontology 572	Palæontology 572

SUMMER COURSE IN GEOLOGY AND TOPOGRAPHY.

FOURTH YEAR.

FIRST TERM.	SECOND TERM.
Physiographic Geology (including Orography) 583	Hydrography (including Tidal Phenomena) 590
Economic Geology . . . 587	Economic Geology . . . 587
Micro-Lithology . . . 589	Ore Deposits 591
Geological Field-Work and Laboratory 581	Micro-Lithology . . . 589
Climatology 580	Geological Field-Work and Laboratory 581
Geodetic Surveying . . . 389	Assaying 484
Hydraulic Measurements . . 393	Geological Memoirs . . . 584
Geological Memoirs . . . 584	Thesis.
Options.	
1. Palæontology (including Osteology) 586	
2. { Mining Engineering . . 481 / Metallurgy . . . 488	

FIVE-YEAR REGULAR COURSES.

The foregoing schedules of the regular courses are arranged for the completion of the work in four years. It frequently happens that considerations of health, lack of opportunities for thorough preparation, or other causes, render it advisable for a student to extend the work over five, instead of four years. To meet such cases, the Faculty have arranged, in most departments, five-year courses which contain precisely the same subjects and amounts of study as the corresponding four-year courses, and differ from them only in the time over which the work is distributed, and, to a slight extent, in the sequence of studies. They lead respectively to the same degrees as the corresponding four-year courses. The standard of scholarship required of the student is in every way the same, and he is classed as a regular student so long as he maintains his standing in the course which he is pursuing. A five-year student may, with the permission of the Faculty, pursue additional or more extended lines of study. He thus has the opportunity of accomplishing more than the equivalent of the four-year course.

Further information may be had upon application to the Secretary of the Institute.

GRADUATE COURSES.

The degree, Master of Science, is awarded for proficiency in complete graduate courses of study of at least one year's duration.

The degrees, Doctor of Philosophy and Doctor of Science, are awarded for proficiency in graduate courses of study of at least two years' duration.

The particular courses of study which candidates for these degrees wish to pursue must be submitted in writing to the Faculty, and must meet their approval. Occasional short absences, when the time is spent upon professional work by advice of the Faculty, will not be considered as interruptions of the student's residence.

Advanced courses in chosen lines of study, and without reference to the degrees, may be pursued by graduates of the Institute

without preliminary examination, or by graduates of other institutions, who shall satisfy the Faculty, by examination or otherwise, that they are qualified to take with advantage the courses proposed.

The continually increasing specialization of the various engineering professions and the upward tendency of the standards of professional attainment render it difficult to give, in a four-year course, much more than a thorough training in the student's chosen specialty. It is thus frequently of great advantage to the graduate from one of the engineering courses to devote an additional year to the professional work of another closely related course, with or without reference to obtaining the degree in the latter. For example, a student who has received a degree in Mechanical Engineering may, by devoting a year to the study of theoretical and practical electricity, graduate in the department of Electrical Engineering; a graduate in Chemical Engineering may do the same; or a graduate in Electrical Engineering or Chemical Engineering may, by a year of additional study, take the degree in Mechanical Engineering.

The student who completes such a double course has obtained a broader scientific and professional education; is enabled to investigate a given problem on more than a single side; and is thus more efficient and independent in engineering practice.

SPECIAL STUDENTS.

In general, no definite schedules for special courses of study are laid down; but special courses may be arranged in accordance with the Schedule of Topics, pages 102 to 130, subject, however, in all cases, to the approval of the Faculty.

All special students in chemistry, who do not come under the two classes to be mentioned in the following paragraph, must pass the full entrance examinations. For exceptional requirements regarding special students in architecture, see page 36.

Persons of mature years, who are engaged in technical pursuits, will be afforded opportunities for the pursuit of laboratory and lecture courses without the exaction of the usual requirements for admission. Moreover, the attention of teachers who desire to

qualify themselves for a higher degree of advancement in their profession is called to the opportunities which are offered at the Institute for afternoon and Saturday laboratory work. Persons actually engaged in the work of instruction, whether in public or in private schools, will be admitted to the Institute without formal examination, and the Faculty will take every occasion consistent with the necessary general conduct of the school to arrange courses for such special students which shall suit their individual needs, alike as to days and hours, and as to the nature of the work to be done. Especially in the departments of Chemistry, Physics, Biology, Geology, Drawing, and Mathematics, can persons having but a few hours a week at their disposal find opportunities at the Institute to extend and perfect their knowledge.

REQUIREMENTS FOR ADMISSION.

Time of Examinations for Admission. — An examination for admission to the first-year class is held in the Rogers Building, 491 Boylston Street, beginning at 9 A. M., on the Thursday following the last Wednesday in June, and continuing two days. A second examination for admission, and for applicants conditioned at the first examination, will begin at 9 A. M., on the first Tuesday after Sept. 17, and will continue two days. (See Calendar, page 2.) Attendance on both days of one examination or the other is required.

Entrance examinations are held in June, in New York, Philadelphia, Chicago, and other principal cities. A circular, giving times and places, is issued in April, and will be mailed on application.

Candidates who intend to be examined in any other place than Boston are requested to send their names to the Secretary in time for him to receive them by June 15. A fee of five dollars is to be paid in advance by every candidate who is examined at any other place than Boston. The whole fee of a candidate who proposes to divide his examination between two years is payable in the year when he begins his examination. The fee should be sent by check, postal order, or registered letter to Albert M. Knight, Bursar, at the same time that the candidate sends his name to the Secretary.

Applicants who intend to take their entrance examinations in September are requested to notify the Secretary of such intention not later than Sept. 10.

Applicants for *advanced standing* — that is, for admission to classes above the first year — must pass the entrance examinations, exception being made of applicants from other colleges (see page 63), and must present themselves for further examination (see page 64), at 9 A. M., on the Wednesday and following days preceding the second entrance examination. (See Calendar, page 2.)

Applications for admission at times other than the above will be received only when illness, or some other equally good cause, has prevented attendance on the days prescribed. A fee of five dollars, to be paid to the Bursar, will be charged for special examinations if required in such cases.

Women are admitted to any of the courses of the school.

ADMISSION TO THE REGULAR COURSES.

First Year. — To be admitted as a regular student in the first-year class, the applicant must have attained the age of seventeen years, and must pass satisfactory examinations covering the requirements detailed below. The requirements of age and scholarship specified ought to be regarded as a minimum in all ordinary cases, and only exceptional circumstances will justify any relaxation of them. Parents and guardians are advised that it is generally for the ultimate advantage of the student not to enter under the age of eighteen years, and that no general attainments secured in advance are to be regarded as superfluous.

The requirements in the various subjects are as follows : —

1. **Arithmetic.** — Special topics as follows : — Ratio and proportion ; common and decimal fractions ; percentage ; metric system of weights and measures ; square root. Much importance is attached to a thorough knowledge of the essentials of the metric system of weights and measures. A satisfactory treatment of these subjects may be found in either Seaver and Walton's, Wentworth and Hill's, or Greenleaf's Complete Arithmetic.

2. **Algebra.*** — Fundamental operations ; use of parentheses ; factoring ; highest common factor ; lowest common multiple ; fractions, simple and complex ; simple equations, with one or more unknown quantities ; involution of monomials and polynomials ; evolution of monomials and polynomials and the cube root of numbers ; the theory of exponents, with applications ; radicals, including rationalization, imaginary quantities, properties of quadratic surds, square root of a binomial surd, and solution of equa-

* See also page 59.

tions containing radicals; quadratic equations; equations in the quadratic form; simultaneous quadratic equations; ratio and proportion; arithmetical progression; geometrical progression. A satisfactory treatment of the topics in algebra may be found in any of the following text-books: Wells's Academic Algebra, Wentworth's School Algebra, or Bradbury and Emery's Academic Algebra.

3. **Plane Geometry.** — As much as is contained in the first five books of Wells's, Chauvenet's, or Wentworth's Geometry. The examination will be based on the first-named work. Much importance will be attached to the applicant's ability to demonstrate original exercises.

NOTE. — **Solid Geometry.** — Candidates will be allowed an examination in September in Solid Geometry, and if successful, will be excused from studying that subject after admission.

In June, 1894, and thereafter, applicants will be required to pass an examination in Solid Geometry or in Advanced Algebra. It is the intention of the Faculty to require both of these subjects at no distant date.

The detailed requirements in these subjects will be as follows: —

In **Advanced Algebra**: inequalities; interpretation of $\frac{a}{\infty}$, $\frac{a}{0}$, and $\frac{0}{0}$; solution of equations by factoring; theory of quadratic equations; factoring of quadratic expressions; variation; harmonical progression; proofs of the binomial theorem for positive integral and for any exponent; expansion of negative and fractional powers of a binomial; determination of any term in the expansion of any power of a binomial; extraction of any root of a number approximately by the binomial theorem; definitions of convergent and divergent series; the theorem of undetermined coefficients, with applications to the expansion of fractions, to the expansion of radicals, and to the separation of a fraction into partial fractions when the denominator can be expressed as the product of factors of the first or second degree; permutations and combinations.

In **Solid Geometry**: The usual theorems contained in text-books on solid geometry, with the exception of theorems relating to similar polyedrons and regular polyedrons. The application of

the above to numerical examples in mensuration as follows: lateral areas and volumes of regular prisms; surfaces and volumes or rectangular parallelopipeds; lateral edges, lateral areas and volumes of regular pyramids, and of frustums of regular pyramids; volumes of truncated triangular prisms; areas of spherical polygons; volumes of spherical pyramids; lateral areas, total areas, and volumes of cylinders, cones, and frustums of cones; areas of zones; volumes of spherical sectors; areas and volumes of spheres; volumes of spherical segments.

Applicants otherwise well prepared may for the present be admitted as special students without the advanced mathematical requirement, with the privilege of taking both subjects after entrance. This should be done, however, only in case the preparation stated is impracticable.

4. **French.** — (1.) Proficiency in elementary grammar, to be tested by translation of easy English into French, or by direct questioning on the following topics: Inflection of nouns and adjectives for gender and number, excepting unusual cases; "pronominal adjectives"; the forms and position of pronouns, especially the personals; the partitive constructions; the inflection of the regular and of the more usual irregular verbs, such as *dire*, *faire*, and of the classes represented by *ouvrir*, *sentir*, *venir*, *paraître*, *conduire*, and *craindre*.

(2.) Ability to translate simple prose at sight, to be acquired by the reading of not less than two hundred and fifty duodecimo pages from at least two dissimilar works.

German. — Candidates not prepared in French may substitute German, in which the requirements will be: —

(1.) Proficiency, to be tested as for French, in the following topics of elementary grammar: declension of readily classified nouns, of adjectives and of pronouns; conjugation of the weak and of the more usual strong verbs; simple cases of word order.

(2.) Ability to translate simple prose, to be acquired by the reading of not less than two hundred duodecimo pages from at least two dissimilar works.

NOTE.— Although a correct pronunciation in modern languages is not, for the present, one of the requirements for admission, it is desired that teachers give this important subject all due attention. Candidates prepared to pass both French and German at the entrance examination will find it advantageous for their subsequent work at the Institute to do so.

5. **English.** — The requirements in English are included within the limits of those prescribed for entrance into the New England colleges.

(1.) The candidate will be required to write, in an hour, on some subject already familiar to him, a short English composition, — correct in spelling, punctuation, grammar, idiom, and division into paragraphs, and plain and natural in style. He will be judged by how well he writes, not by how much he writes. For convenience, and in order that the candidate may be acquainted with good models of style, the subjects will be taken from one or more of the following books, *with all of which the applicant is expected to be familiar* : —*

For 1893 : Scott's Marmion, Longfellow's Courtship of Miles Standish, Addison's Sir Roger de Coverley Papers, Macaulay's second Essay on the Earl of Chatham, Emerson's American Scholar, Irving's Sketch Book, Scott's Ivanhoe, Dickens's David Copperfield.

For 1894 : Scott's Lady of the Lake, Arnold's Sohrab and Rustum, the Sir Roger de Coverley Papers in the Spectator, Macaulay's second Essay on the Earl of Chatham, Emerson's American Scholar, Irving's Sketch Book, Scott's Abbot, Dickens's David Copperfield.

For 1895 : Shakespeare's Merchant of Venice and Twelfth Night, Milton's L'Allegro, Il Penseroso, Comus, and Lycidas, Longfellow's Evangeline, the Sir Roger de Coverley Papers in the Spectator, Macaulay's Essays on Milton and Addison, Webster's first Bunker Hill Oration, Irving's Sketch Book, Scott's Abbot.

(2.) The candidate will also be required to correct specimens of bad English set for him at the time of the examination. Strang's Exercises in English, Revised Edition (Boston : D. C. Heath & Co., 1893), and Whitney and Lockwood's English Grammar (Ginn &

*These books may all be had in an inexpensive form. A list of publishers and net prices will be sent upon application to the Secretary of the Institute.

Co., 1892), are recommended for use in preparing for this part of the examination.

6. **History.** — Preparation in either United States History or Ancient History may be offered. In the former subject a thorough acquaintance with the history of the Thirteen Colonies and of the United States down to the present time is required. In the latter subject the requirement covers the history of the early world down to the fall of the Roman Empire in the West.

If single text-books are used, Montgomery's History of the United States, or Mrs. Sheldon Barnes's or Johnston's may suggest a satisfactory amount of preparation; for the study of Ancient History, Myers and Allen's Outlines of Ancient History is recommended but not prescribed.

The former requirement in geography has been discontinued.

DIVIDED ENTRANCE EXAMINATIONS.

Candidates for admission will be allowed, at their option, to divide their entrance examinations between two successive years. The first divided examination will be held only in June; the second, in either June or September of the *following* year, at the dates named on page 57. To be admitted to the first divided examination the candidate must be at least sixteen years of age, and must present a certificate from his teacher, stating that he is qualified in the subjects in which he applies to be examined.

For the first divided examination the candidate will be allowed the choice of any of the following six subjects, but he must take Arithmetic, and no credit will be allowed on any of these unless at least four of the six are satisfactorily passed. At the second examination those subjects not passed at the first must be taken, as well as the Advanced Algebra or Solid Geometry, which cannot be taken at the first examination.

I. Arithmetic (including Metric System).
II. Algebra.* (See page 58.)
III. Plane Geometry.
IV. French (or German, see page 60).
V. English.
VI. History.

Details of the above requirements are given on pages 57 to 62.

* Preliminary applicants in June, 1893, will be allowed an examination in Algebra to Quadratics, as heretofore.

In general, the training given in the best high schools and academies will afford suitable preparation. To the student the importance of thorough preparation is great, since the character and amount of instruction given in the school from the outset leave little opportunity for one imperfectly fitted to make up deficiencies, and render it impossible for him to derive the full benefit from his course, or perhaps even to maintain his standing. Applicants are advised to attend the June entrance examinations, if practicable, in order that any deficiencies then existing may be made up before entrance.

Students will find their progress in Physics and Chemistry promoted by making themselves thoroughly familiar with the elements of Physics, as set forth in any of the text-books ordinarily used in high schools, or, preferably, by pursuing an elementary course in physical laboratory work.

A knowledge of the Latin language is not required for admission; but the study of Latin is strongly recommended to persons who purpose to enter the Institute, as it gives a better understanding of the various terms used in science, and greatly facilitates the acquisition of the modern languages. Those who intend to take the course in Biology will find it advantageous to acquire also the elements of Greek.

It should be borne in mind by the student purposing to enter the Institute that the broader his intellectual training in any direction, and the more extensive his general acquirements, the greater are the advantages he may expect to gain in his future course.

ADMISSION TO ADVANCED STANDING.

To be admitted as a regular student in the second, third, or fourth year, the applicant must have attained the corresponding age (eighteen, nineteen, or twenty years respectively), must in general pass satisfactorily the examination for admission to the first year's class, and examinations on all of the subjects given in the earlier years of the course which he desires to enter. The examinations for advanced standing are held at the time stated on page 2. (See pages 57 to 62, and pages 27 to 53.)

Graduates of colleges are admitted to the Institute without the usual entrance examination, and will be permitted to enter any of the courses at such a point as their previous range of studies will allow. If prepared to enter upon most of the studies of a certain year, they will be afforded opportunity to make up any studies of the earlier years in which they are deficient; they will, in general, be credited with all subjects in earlier or later years in which they can show, by examination or otherwise, a standing satisfactory to the Faculty, and may be received provisionally as regular students. The attention of such applicants is particularly called to the schedules of courses on pages 27 to 53, and to the Schedule of Topics on pages 102 to 130. It is highly desirable that students contemplating professional courses after graduation from college arrange their college electives to cover the earlier subjects of the courses chosen, in order that the number of deficiencies to be made up may be as small as possible; such students are advised to communicate with the Secretary of the Faculty, from whom detailed information may be obtained as to the requirements for entering a particular year of any course. In order to enter any of the engineering courses in the third year, it will be essential for the applicant to be familiar with the Differential Calculus. It is exceedingly desirable that students applying for advanced standing in these courses should have had considerable practice in mechanical drawing.

ADMISSION OF SPECIAL STUDENTS.

To be admitted to one or more selected subjects in any of the regular courses, — that is, to a partial or special course, — the applicant must have attained the age of seventeen years, and must pass satisfactorily such examinations as shall prove him qualified to pursue to advantage the subjects chosen.

By means of the Schedule of Topics and requirements as given on pages 102 to 130, the applicant may ascertain what the various subjects of study are, how, when, and by whom they are given, in what regular courses they are included, and the preparation required for each; but admission to special courses is dependent in all cases upon the approval of the Faculty. In general, no student

will be allowed to take any one of these topics until he has passed a suitable examination in all other topics required as preparation for it.

All special students desiring to take Chemistry of the first year must pass the full entrance examinations, except that an equivalent in some other subject may be substituted for Plane Geometry. Communications in regard to such substitution should be addressed to the Secretary of the Faculty.

The Institute desires to offer the amplest opportunities in its lecture-rooms and laboratories to teachers, and to persons of mature age engaged in technical pursuits, wishing to devote some time to scientific study. Such persons may be admitted, in certain cases, without formal examination, on satisfying the Faculty that they are qualified to undertake the work proposed. They will be expected after admission to attend the same exercises and examinations as other students.

REQUIREMENTS FOR GRADUATION.

The degree of Bachelor of Science, in the course pursued, is given for the satisfactory completion of any of the regular courses of study.

To be entitled to a degree, the student must have completed the prescribed studies and exercises of the four years, and must, in addition, pass final examinations, if required, on subjects relating particularly to his course. He must, moreover, prepare a dissertation on some subject included in his course of study; or an account of some research made by himself; or an original report upon some machine, work of engineering, industrial works, mine, or mineral survey; or an original design, accompanied by an explanatory memoir. This thesis or design must be approved by the Faculty. Theses are to be written on one side only of paper of good quality, 8 x 10½ inches in size, with an inch margin on the inner edge, and a half-inch margin on the outer edges. Theses must be handed to the Secretary of the Faculty, not later than the first annual examinations.

No degree can be conferred until all dues to the Institute are discharged.

Students leaving the Institute of their own motion before graduation are entitled to receive a certificate of honorable dismissal, if their record for conduct, attention to studies, and scholarship is declared satisfactory by the Faculty.

SUBJECTS AND METHODS OF INSTRUCTION.

Instruction is given by lectures and recitations, and by practical exercises in the field, the laboratories, and the drawing-rooms. Text-books are used in most, but not in all subjects. In many branches the instruction given differs widely from available text-books; and, in such cases, notes on the lectures and laboratory work have been printed, either privately or by the Institute, and are furnished to the students at cost. A high value is set upon the educational effect of laboratory practice, drawing, and field-work. Besides oral examinations in connection with the ordinary exercises, written examinations are held from time to time. Near the close of the months of January and May general examinations are held. After the examinations, the standing of the student in each distinct subject is reported to his parent or guardian. Reports of standing are based to a very large extent upon the quality of daily class-work. The January and May reports form the basis of admonition or advice from the Faculty in the case of students who are not profiting sufficiently by their connection with the school.

Mathematics. — Great importance is attached to the study of mathematics, both as a means of mental discipline and as affording a necessary basis for further instruction in the engineering and other courses. (See page 104.)

The four topics following are taken by all regular students: Solid and Spherical Geometry; Higher Algebra; Logarithms and Plane Trigonometry; Plane Analytic Geometry, including the equations and properties of the point, right line, and circle, and of the parabola, ellipse, and hyperbola. (A shorter course in this subject is given to students in Courses VII. and IX. in place of the Spherical Trigonometry included in the other courses.)

Students in all the Engineering courses receive instruction in the Differential and Integral Calculus.

In addition to the above, the following topics are given in some courses: Differential Equations with applications to problems in Geometry; the Theory of Probability and Method of Least Squares, including the adjustment of observations and the computation of probable errors.

As elective work, opportunities are afforded for the study of Advanced Algebra and Trigonometry, including De Moivre's Theorem and its applications; the General Theory of Equations, with the solution of higher equations by methods of approximation; Determinants; Analytic Geometry of Three Dimensions, including the equations and properties of the point, right line, and plane, of the sphere, cylinder, and cone, and of the paraboloids, ellipsoids, and hyperboloids; an advanced course in the Calculus, including the theory of Definite Integrals; Quaternions.

Drawing and Descriptive Geometry. — Instruction is given to all regular students in the principles of Geometrical, Mechanical, and Freehand Drawing; and a large amount of time is devoted to practice in the drawing-room, to enable the student to acquire the skill necessary for his future work. Drawing is also continued in connection with the professional studies.

The exercises in Descriptive Geometry are of two kinds. In the lecture-room the instruction is given by means of models and diagrams, and also by the use of text-books. In the drawing-room the student is drilled in the solution of problems designed to illustrate the work of the class-room, and to make him thoroughly familiar with the subject.

The instruction in Freehand Drawing includes an elementary course taken by all regular students, and more advanced work in the departments of architecture, biology, and geology. For students in architecture, studies in charcoal are usually required, and opportunity is afforded for those who have made satisfactory progress to sketch in pencil, pen and ink and with the brush. Importance is attached to drawing from memory and to rapidity of execution. Students in biology and geology pay special attention to specimen drawing.

Besides the large and well-equipped freehand drawing-rooms of the Institute, the Museum of Fine Arts offers excellent opportunities for drawing from the cast, and regular exercises for advanced students are held in its galleries.

Modern Languages. — While the primary object of the instruction in French and German is facility in translation, so that the student may avail himself of foreign works relating to his professional department, much importance is attached to the study of these languages as a means of general training. For both purposes, a thorough and systematic study of the structure of the language is deemed to be an essential basis. This is, however, accomplished by means of practical work with the language itself, including written and oral exercises, rather than by study of the abstract rules of grammar. French (see conditions of admission, page 60) is continued through one year, and German through two years, for all regular students. In certain courses, especially in Course IX., there is advanced and special work in French and German, in part optional. Instruction in the elements of Italian and Spanish is also offered.

English. — All regular students receive instruction in English during the first two years of their course. During the first half of the first year they hear lectures on the principles of English composition, designed to help them in expressing themselves fluently and adequately, rather than to develop a theory of rhetoric. Each student, moreover, writes, frequently and regularly, themes and exercises of various sorts, which are corrected and returned by the instructors. The student has also frequent opportunities for consulting the instructors in private about his especial needs. During the second term of the first year, and during the third year, by the courtesy of other instructors, all written exercises in History and Political Economy are subject to examination and correction by the English Department, which is thus enabled to direct continually the progress of each student in English composition. Throughout the second year instruction is given in the history of English literature, with practice in composition under

the personal supervision and criticism of the instructor. In this course the student is required to read, as a whole or in part, such representative works as shall give him the best idea of the history and general character of English literature. The aim of the department is to give students who are looking forward to professional or business life such drill as will help them to express themselves readily, accurately, and adequately, and to aid them in the understanding and appreciation of good literature.

In Course IX., instruction is offered in the following subjects, optional or required: English Literature of the Nineteenth Century, English Literature of the Eighteenth Century, Elizabethan Literature, English Literature before 1560, Contemporary English and American Literature, Logic, Advanced English Composition, and Latin Reading with special reference to English etymology. The aim in view is to give the student thorough drill, according to modern methods, in the literary history of the periods mentioned, and to enable him, by theory and by practice, to express his ideas in a correct and adequate form.

History and Political Science. — The study of three comprehensive topics in history and political science is required of all regular students, as follows: —

In the first year, Modern Political History of foreign nations, illustrating the political progress of the world during the present century.

In the second year, American History, completing the foregoing survey of history and politics.

In the third year, Political Economy and Industrial History, including the discussion of current economic problems.

These three general subjects may be followed or accompanied by several series of more highly specialized historical and political studies, which are required in one or more courses, and are open to all qualified students. The history of England and the United States may be studied continuously for three years, involving the story of the development of the political systems of both countries from their common origins, the comparative study

of their political constitutions, and an inquiry into the local history of the United States.

Mediæval and modern European history may be studied throughout two years. The first year is devoted to an investigation of the History and Literature of the Renaissance and the Reformation. It includes a survey of the social, political, and religious history of the Middle Ages, comprising such topics as the struggle between the papacy and the empire, the rise of the free cities, ecclesiastical history, the development of European literature from Dante to Lessing, and of the fine arts throughout the Renaissance, and the history of education in Europe from the early monastic schools to the days of Pestalozzi and Froebel. This course introduces the student in the following year to the study of the era of the French Revolution.

The instruction in Social Science and History has been arranged so as to connect the instruction in Biology with that in History. These two departments present an unbroken sequence of related studies extending through three successive years of the Course IX. curriculum. This series rests upon the fundamental knowledge of living forms and of prehistoric man that is presented in General Biology, Zoölogy, and Anthropology. In the classes in Social Science and History the student passes to the consideration of rudimentary social organisms, of primitive political and religious conceptions, and of ethnological questions. The lectures treat of the historical development of the family as an institution of society, and of the mutual relations of family, state, and church. Institutional history prepares the way for a comparative study of constitutions and political philosophies in Comparative Politics and Constitutional History. The last link in the chain is International Law, or the relations of separate states, examined especially in the light of the experience of the United States.

Instruction is imparted by lectures, oral and written recitations, and assignments of reading for which students are held strictly responsible. The topical method of study is adhered to, so far as possible, and syllabuses of lectures and reference readings are placed in the hands of each student.

In the group of economic studies extending through three years,

the course upon the elements of political economy is first followed by certain detailed studies in current financial and monetary questions. For this purpose government reports, including those of the Secretary of the Treasury, Comptroller of the Currency, and Director of the Mint are read with criticism and explanation.

During the succeeding years, the economic instruction is devoted to five different lines of inquiry: Finance and Taxation, Commercial and Industrial History, Socialism, History of Economic Theory, and Statistics.

The financial history of the United States from 1789 until the present time is studied. This includes tariff history, particularly the relation of the tariff to important industries, such as the iron, cotton, and woollen. Use of public documents is taught, and the student is required to go to official sources for authority as to statements of fact. A second course is directed to the theory and history of taxation in general. Ancient and mediæval systems are contrasted with modern ones. Local taxation and its application to American states and cities is also discussed. A third optional course on the theory of banking and finance describes the most important banking institutions of the world, and treats with more detail the question of bimetallism.

Two courses in Commercial and Industrial History are presented. The first treats of the development of industrial relations between the several classes of society, embracing in its scope the topics of gilds, trade-unions, the factory system, strikes, arbitration, and workingmen's insurance. Attention is chiefly confined to England and the United States. In a second course, emphasis is placed upon the physical conditions of trade, the production and distribution of the great staples of commerce, the problems of shipping, and the development of railway transportation.

The course on Socialism considers the economic systems proposed, particularly during the present century, to change the existing distribution of wealth. Systems of co-operation, profit sharing, and governmental control of industries are considered from this standpoint.

In the last term of the course, a return may be made by optional work to the study of economic theory. The previous general historical studies, as well as the more special ones in finance and

industry, lead the student to the development of the different schools of economic thought from the mercantilists and physiocrats to the more modern representatives of the science.

In Statistics there are two courses. The first is elementary, and is devoted to the use of statistical data of the United States, especially in their application to problems of finance. Practical handling of statistical material in the Finance and Commerce and Navigation reports is demanded, and graphic methods by the drawing of statistical diagrams are freely introduced. Chart paper, specially designed, and drawing tables are provided for this purpose. The more advanced course treats of the general subject of statistics, its history, method, and technique. It embraces a discussion of demography, vital statistics, censuses, and statistics of immigration and of crime, education, and religion. A good working library in statistics has been gathered, and the library of the American Statistical Association, which is kept in the rooms of the department, affords special advantages.

The Reading-Room of the Department contains libraries of authorities to be consulted in the required reference work, a large number of the best magazines and newspapers, both bound and unbound, which are useful in historical, political, and literary study, together with reading tables, and work tables for the preparation of maps, charts, diagrams, and especially for statistical work. There is a good collection of maps and diagrams particularly serviceable for the illustration of industrial and political history. The library in connection with the reading-room comprises over five thousand selected volumes and several thousand pamphlets. Every student enjoys immediate and unrestricted access to the shelves.

Chemistry. — All regular students attend a course of lectures on Inorganic Chemistry, illustrated by experiments, and perform actual experimental work in the laboratory of general chemistry. The lectures are intended to prepare the student for his work in the laboratory, and to emphasize and co-ordinate the facts which he there learns. In the laboratory, the student receives instruction in chemical manipulation, and performs a series of experiments

designed to illustrate the properties of the more important elements and the laws of chemical action. In connection with the lectures on Inorganic Chemistry, the elements of qualitative analysis and of theoretical chemistry are taught, and the student has practice in the solution of stochiometrical and other chemical problems. The study of the theory of the subject is continued in the chemical and other related courses by more advanced lectures and recitations, in which are presented the prevailing theoretical views as to chemical action, the constitution and classification of chemical compounds, as well as certain portions of molecular physics, which bear directly upon chemical theories, especially in thermo-chemistry.

The instruction in Analytical Chemistry extends through two or more years. Each student is given a desk in the laboratory, which is open to him at all times. He receives personal instruction, and has analytical work assigned him, with particular reference to the course he is pursuing. This work is so arranged that he obtains experience in a great variety of methods and processes, and is thus prepared to undertake any chemical analysis. The more industrious students, and those who work extra time in the laboratory, have the privilege of supplementing their regular laboratory course with special work and instruction. Special students may select any branch of analytical work for which they are qualified.

Particular attention is given to volumetric analysis. A special laboratory is fitted for this work, and the students are taught to graduate and calibrate the various instruments of measurement. Instruction in this branch is given by a systematic course of lectures combined with laboratory practice, covering a considerable number of quantitative processes. The facilities for gas analysis have recently been increased by the enlargement of the rooms devoted to this work, and by the addition of much new apparatus.

As an introduction to original work, each student is required to undertake a critical examination of some process of analysis, to determine its limits of accuracy under various conditions, and to make a written report thereon.

The special instruction in the laboratory is supplemented by lectures upon methods of analysis and manipulation; and the current chemical literature in English, French, and German is reviewed

by the students, and subsequently discussed in the class-room under the direction of an instructor.

The instruction in Sanitary Chemistry consists mainly of laboratory work, and special laboratories have been equipped for the purpose. For all who choose to pursue this subject, a minimum amount of work is laid out, consisting of practice in the methods commonly used in the chemical examination of air and water, of milk and of butter. For those who wish to take a more extended course, opportunity is afforded for the critical study of other methods of analysis, for the examination of other articles of food, and for the investigation of a variety of sanitary problems in which chemical questions are involved.

Industrial Chemistry is taught by a course of lectures and by work in the laboratory of industrial chemistry. A full description of the most important technical applications of chemistry is given in the lectures. A part of the lectures are given by persons actively employed in carrying out the processes which they describe. In the industrial laboratory, the students prepare chemical products from raw materials, and also undertake the preparation of pure chemicals. They are taught fractionation and distillation; and particular attention is paid to the preparation of dyes and mordants.

Dyeing and coloring receive special attention. The course of instruction includes the bleaching and dyeing of silk, and of cotton and wool, in the piece, and in yarn. The students are taught how to use mordants, and to perform the common operations of the dyehouse. They become acquainted with the principles involved in cotton printing, and have some experience in mixing colors. The methods of detecting the nature of the dyestuffs present upon fibres are taught, together with many of the modern methods of commercial analysis. A special laboratory is used for this instruction; it contains a very complete equipment for experimental dyeing and coloring. The laboratory instruction is supplemented by frequent excursions to manufacturing establishments, where the practical working of chemical industries can be examined.

The instruction in Organic Chemistry is given by lectures and by laboratory work. The theories of organic chemistry are discussed,

and the practical applications of these theories described. The work in the laboratory consists of ultimate analysis, preparation of organic products, and original research. Particular attention is paid to the coal-tar derivatives and to the chemistry of the artificial colors. The researches undertaken in this laboratory deal, for the most part, with those problems in organic chemistry which have a distinctively technical bearing. Ample opportunities are afforded for the prosecution of investigations in the domain of pure chemistry.

The instruction in chemistry is designed primarily for those who are candidates for the several degrees of the Institute, and for such special students as are looking to chemistry as a profession, and are following, in the main, the courses laid out for the regular students. In order to secure the necessary command of chemical literature, these special students are required to study French and German as a part of their course.

The Kidder Laboratories of Chemistry afford accommodations for six hundred and twenty-five students. The chemical department occupies eighteen laboratories, four lecture-rooms, a reading-room and library, balance-room, offices, and supply-rooms, — in all, thirty rooms. Three new laboratories have been recently added for advanced work and research. The laboratory for general chemistry has places for four hundred students, and is very completely equipped for instruction in elementary chemistry. The analytical laboratory can accommodate one hundred and fifty students, and possesses every convenience for accurate and rapid analytical work. The organic laboratories have places for thirty students. Conveniences are afforded for conducting offensive and dangerous operations in the open air, or in a separate room. The laboratories for sanitary chemistry contain places for sixteen students. They possess a very complete outfit for the analysis of air and water, and for the investigation of sanitary problems. The laboratory of industrial chemistry accommodates thirty students. It consists of a series of rooms fitted with the needful apparatus for the preparation of chemicals on a considerable scale. The students are here taught the preparation of chemical products from raw

materials, the utilization of the by-products, and the methods for the purification of chemicals. A special assignment of work is made for each student, so that he may see a varied line of work. The laboratory contains kettles of various patterns, stills, presses, tanks, centrifugal dryers, filter-press, crystal dryers, furnace, and a variety of other apparatus. The laboratory devoted to textile coloring contains numerous jacketed kettles, baths, and dye-tubs, squeeze-rolls, steamer, ager and dryer, and a two-color printing machine. Kidder Hall has a seating capacity of one hundred and eighty, and is arranged with special reference to the delivery of experimental lectures. In addition there are three smaller lecture-rooms, seating respectively seventy-five, thirty, and ten students. The lecture-rooms contain valuable cabinets of specimens for purposes of illustration. The balance-room is supplied with twenty-two analytical balances.

The William Ripley Nichols Chemical Library, numbering more than five thousand volumes and two thousand pamphlets, is kept in the reading-room of the department. This library contains complete sets of most of the important chemical periodicals and a noteworthy collection of works upon sanitary science. It is open to all persons who desire to consult it.

Physics. — The instruction in Physics begins with a series of lectures attended by all regular students, in which the whole subject is discussed. The various branches are treated both mathematically and experimentally. In all cases the theoretical discussion of a question is followed by an account of its practical applications.

In addition to the courses of lecture-room and laboratory exercises in physics, which are required of all regular students, various special courses of lectures, readings, and laboratory exercises in Optics, Acoustics, Heat, and Electricity are provided for those making a specialty of physics. Students pursuing these courses gain a familiarity with standard works on the various branches of physics, both in their own and in foreign languages. In the latter part of the course, each student prepares and reads before his class an essay on some physical topic. These essays are written after a study of recently published papers and memoirs, and often

embody also the results of experimental work by the student. They are intended to familiarize the class with the topics presented, and to give experience in independent study and in the preparation of original scientific papers. This work is of particular advantage to those who intend to become teachers. Instruction is provided in Photography and its applications, in Microscopy, and in the use of the lantern as an instrument of demonstration in the lecture-room. A course of lectures and laboratory instruction in Heat Measurements, including pyrometry and fuel tests, has been instituted, and the course in general Electrical Measurements is undergoing continual extension. Opportunity will be offered for more advanced instruction in mathematical physics to students who are competent to pursue such courses.

The Rogers Laboratory of Physics. — Regular students, excepting those in Architecture and in the Course in General Studies, enter upon a general course of experimental work in this laboratory upon the conclusion of the lecture course in Physics. The work is designed to strengthen the student's grasp of the laws and phenomena of that science, and to impart to him a knowledge of methods and instruments used in measurement, and of the mathematical discussion of experimental results. The laboratory work consists almost exclusively of quantitative measurement. The earlier and simpler work serves chiefly to train the student in the use of methods or instruments which are employed as accessories later. This is succeeded by experiments on the mechanics of solids, liquids, and gases, each illustrating a method by which some physical law or constant is determined. Work in optics follows; and heat and electrical measurements occupy the remaining and more difficult part of the course. More advanced instruction is also provided.

Accurate work is required throughout; and in connection with the use of instruments of precision, especially in the more advanced measurements, the student's attention is particularly directed to the study of possible sources of error, and to the discussion of the effects of these on the results obtained, a short lecture course being also devoted to this subject.

The particular line of work assigned to each person is determined, to some extent, by his course in the school; and the instruments which he studies are often such as he will be called upon to use in later technical work. In some courses, such as Physics, Electrical Engineering, and Chemistry, work of a more advanced scientific or technical nature is undertaken. Original investigation is encouraged as far as possible, and the result has been a considerable number of published memoirs.

The library of the department contains the standard works upon various branches of physics, numbering thirty-three hundred volumes, and new publications of value are added as they appear. It is especially full in works relating to electricity. The leading scientific and technical periodicals devoted to physics and electrical engineering are regularly received, and are accessible to students. The study of special topics is greatly facilitated by many valuable libraries, to which, by right or courtesy, the students have admission.

Theoretical and Applied Mechanics. — The subjects first treated are the Composition and Resolution of Forces, the general laws of Kinematics and Dynamics mathematically discussed, the principles governing the determination of the stresses in the different members of trusses, centre of gravity, moment of inertia, and the ordinary principles of the strength of materials.

The more advanced instruction in this subject aims to familiarize the students with such data on the strength of materials used in construction as have been obtained by means of experiments, especially those made on a practical scale, in different parts of the world. Pains are taken to keep this work well up to date. This is followed in particular courses by the study of friction and lubrication, of continuous girders, of stone and iron arches, and of the theory of elasticity. Besides the above, each student has made during the school year 1891–92 the following tests in the laboratory: —

1. A test to determine the modulus of elasticity, the limit of elasticity and tensile strength of a cast iron, or wrought iron, or steel rod or bar, or the transverse strength of a coupling.

2. A test of the deflections, and of the transverse strength of a full-size iron or steel I-beam, or of a wooden beam subjected to a transverse load.

3. A test to determine the modulus of elasticity, and the tensile strength of annealed or bright iron wire.

4. A test to determine the shearing modulus of elasticity of a shaft.

5. Tests of the tensile strength of hydraulic cement.

6. Tests of the compressive strength of hydraulic cement.

Civil Engineering. — The instruction is given by means of lectures and recitations, and by practice in the field and in the drawing-room.

In Surveying, besides the work in the class-room, the use of the various instruments is taught by actual work in the field, including the adjustments of the instruments, and the principal operations involved in land, topographical, hydrographical, railroad, city, and underground surveying. The work in the drawing-room consists in representing upon paper the surveys made in the field, with practice in topographical and map drawing. The field work of the second year includes the use of the chain, tape, compass, transit, level, and solar compass, as well as of the various pocket instruments. That of the third year includes the use of the stadia, sextant, and plane table. In the fourth year the short course in Practical Astronomy includes a discussion of the methods of determining latitude, longitude, time, and azimuth, together with the theory of the usual astronomical instruments. The short course in Geodesy includes a discussion of the figure of the earth and of the methods of measuring base-lines, and of carrying on a geodetic survey.

Students electing the Geodetic option pursue these subjects in detail, taking also the course in Least Squares, and receiving instruction in the adjustment of observations.

The course in Railroad Engineering treats of the survey, location, construction, and equipment of railroads. In addition to the work in the class-room, an actual railroad survey and location, several miles in length, are made each year upon such ground as shall best illustrate the problems occurring in practice, and the necessary maps and profiles are prepared by the students. Advanced courses are given, in which the economics of railroad location are discussed, also the subjects of rolling stock, motive-power, train resistance,

brakes, signals, yards, stations, tunnels, and street railways of various kinds. Railroad administration and management form the subject-matter of a distinct course.

The work in Road or Highway Engineering embraces the location, construction, and maintenance of town and county roads, and of city streets and pavements. Through means furnished by Col. Albert A. Pope, of Boston, the facilities for instruction in this branch are now complete, and the equipment of the department. in books, models, apparatus, and drawings, is constantly increasing,

The course in Hydraulic Engineering embraces, first, a detailed study of the principles of Hydraulics, including the laws of Hydrostatics and of the flow of water through orifices, over weirs, and through pipes, with numerous problems illustrating the practical application of the principles discussed; second, practice in Hydrometry, in which the student is instructed in the methods of gauging the flow of streams, with practice in the field, using instruments of various kinds; third, practice in carrying out hydraulic experiments on the flow of water and on the loss of head, under various conditions, with the aid of the tank and other apparatus in the hydraulic laboratory, as well as in the testing of motors, and other similar work; fourth, a course of lectures covering the subjects of hydrology, rivers and canals, water supply, water power, hydraulic motors, coast and harbor works, and irrigation. The student is made familiar with the principles involved, and is given a foundation on which he can afterward safely base his more extended practical studies. Special attention is given to hydrology, water power, and water supply.

The instruction in Sanitary Engineering is given by a course of lectures, supplemented by exercises in designing. The object sought is to prepare the student to deal intelligently with certain questions relating to the health of individuals and communities, and to properly plan works of sewerage and drainage. The course embraces the study in detail of the house, with its apparatus, the disposal of sewage for isolated buildings by surface or sub-surface irrigation, the collection and removal of sewage in the larger towns, and the sanitary drainage of cities. Frequent opportunities are given for the inspection of actual examples of sanitary engineer-

ing, and a study is made of the questions of the day in relation to public health. The students also attend lectures and demonstrations in Sanitary Science and problems affecting the public health.

The course in the Strength and Stability of Structures embraces a study of the methods of proportioning beams, floors, columns, roofs, bridges, piers and abutments, arches, retaining walls, and similar structures. Both the analytical and graphical methods of investigating the strength and stability of structures are taught. The course in Bridges and Roofs involves an extended study of the different structures of this class, of wood, stone, and metal, with reference to economy of material, methods of proportioning parts, and the details of design; the subject of foundations is also included. Parallel with these courses runs the work in the drawing-room, in which the student is required to make complete designs and working drawings, with blue-prints, for several structures of this kind. The materials used in engineering are studied in the courses on the Strength of Materials and the Metallurgy of Iron; and further attention is devoted to this subject, in connection with others, by taking up each material in connection with the structures in which it is most extensively applied. The study of Specifications and Contracts is also pursued in connection with each of the special courses, and actual specifications are studied, each in its proper place.

In the summer vacation following the third year, students taking the geodetic option are required to attend a summer course in Topography, Geology, and Geodesy, during four to six weeks in the early part of the summer. This is held at some convenient and suitable point in the country, and its object is to give the students opportunity for more extended and continuous field practice in these branches than is possible during the term. The work done consists of a topographical survey of a certain district, with field practice in geodesy and geology. The course is open, without extra charge for tuition, to all students in the department who have completed the third year, as well as to properly qualified students in other departments. Persons not connected with the Institute may also be permitted to attend, upon giving satisfactory evidence of being properly qualified, and upon payment of the tuition fee of $25.00.

By the kindness of many active members of the profession, and especially through the courtesy of Mr. W. H. Barnes, General Manager of the Boston and Albany Railroad, of Mr. D. W. Sanborn, Superintendent of the Boston and Maine Railroad, and of Mr. Charles F. Choate, President of the Old Colony Railroad, the classes are frequently enabled to inspect engineering works of interest, and to carry on field operations in specially favorable localities. The aid thus received has been of very great value.

In addition to the regular lectures of the school, occasional lectures are given by prominent engineers, in active practice in their profession, upon subjects with which they are especially familiar. During the past year lectures have been given by Mr. George W. Blodgett, Electrician of the Boston and Albany Railroad, on the Application of Electricity to Railway Working; by Mr. John R. Freeman of Boston, on Fireproof Construction and the Hydraulics of Fire Protection; and by Mr. F. P. Stearns, Chief Engineer of the Massachusetts State Board of Health, on Ground Water Supplies.

The instruments and apparatus of the department may be classified as follows: A full outfit of the instruments used in surveying and in the drawing-room; a collection of hydraulic apparatus for work in the field, comprising single and double floats of various patterns, loaded tubes, and current meters of different kinds; and continuous record instruments for measuring the strain in bridges and other structures of iron. The very complete hydraulic apparatus for the measurement of the flow of water through orifices and mouthpieces, over weirs, through pipes, etc., is described elsewhere, in connection with the engineering laboratories.

The department has also a collection of models, illustrating bridge details, problems in stone cutting, etc., for use in connection with the work of instruction.

In order to provide for the needs of students wishing to pursue graduate courses of study, leading, if desired, to the degree of Master of Science or Doctor of Philosophy, an advanced course has been laid out, which includes, besides original work in research and criticism, further instruction in Bridge Construction and Design, Theoretical Hydraulics, and the Theory of Elasticity, with special

reference to its applications to the strength of materials, together with experimental work in the engineering laboratories.

Mechanical Engineering. — The instruction is given by means of lectures and recitations, and by practice in the drawing-rooms and in the engineering laboratories. Visits are made also to machine shops and manufacturing establishments, to witness machinery in operation, and manufacturing processes which cannot be seen at the Institute itself.

The course in the principles of Mechanism and in the construction of gear-teeth is followed by study of the mechanism of machine tools and of cotton machinery.

The course in Steam Engineering includes a detailed study of the principles of Thermodynamics, mathematically treated; a discussion of the properties of gases and vapors, especially steam; of the flow of steam and other fluids, of the steam injector, and of the hot-air engine. All of these topics are treated in such a way as to give the student a good foundation in the principles of Thermodynamics, especially as they apply to the steam-engine. This is followed by a study of the steam-engine itself, of the compound and multiple-expansion engine, of the mode of testing steam-engines and of steam-boilers. A careful study is made of such data as have been based on reliable tests made on large, single, compound, and multiple-expansion engines. The gas engine is studied, also air-compressors and refrigerating machines.

In Machine Design, each student is required to make a certain number of designs, as the design of a boiler, of a large shaft with gears and pulleys, of a set of hangers, etc., to make all the necessary calculations and drawings, determine the strength of every part by means of the principles already learned.

The main principles of Hydraulics and of Hydraulic Motors are studied with particular attention to the turbine.

The course in Locomotive Engineering begins with a careful study of the details of the more usual types of locomotives, and of the strength of the more important parts. The following topics, among others, are discussed: train resistance, brakes, heating by steam from the locomotive, compound locomotives. The course in Marine

Engineering includes a detailed study of the design and construction of single, compound, and multiple-expansion marine engines, with a discussion of their form, proportions, and efficiency, as well as of the strength of the several parts. Mill Construction is studied together with the processes to be carried out in a cotton mill, so far as to enable the student to take up intelligently the laying out of machinery to best advantage, including the planning of the power plant and the distribution of power, all leading up to the designing and building of the mill itself.

An extended course is offered in the Theory of Naval Architecture, similar to that given in the government schools of England and France. The department is now in possession of the drawings, lines of ships, displacement sheets, and other material necessary for carrying on this work.

The laboratory work, in its earlier portions, is devoted to giving the student a drill in such experimental work as a mechanical engineer has constantly to perform, such as boiler and engine tests, etc. The later work takes very largely the form of original research; and it is intended that the students in these laboratories shall, under suitable direction, undertake the experimental investigation of a number of important engineering problems.

In connection with the course in Mechanism, practice is given in making working drawings of parts of machinery from measurements, and other drawings illustrating the class-room work. In connection with Thermodynamics, detail drawings are made from measurement of some machine and from these assembly drawings. This is followed by practice in boiler drawing and in the working out of valve gears and mechanism designs.

Besides the teaching by the regular corps of instructors, lectures upon special subjects are given by gentlemen actively engaged in the profession. During the past school year lectures have been given by Mr. Henry R. Towne, of the Yale & Towne Manufacturing Co., on Shop Management; by Naval Constructor J. J. Woodward, U. S. N., on Naval Construction; by Mr. George A. Stewart and Mr. Arthur Binney, on Yacht Designing; by Mr. James N. Lauder, of the Old Colony Railroad, on the Locomotive; and by Mr. Stephen Greene, on Rope Driving.

Electrical Engineering. — As a foundation for subsequent work, instruction is given in the theory of electricity. An extended course of lectures is devoted to the detailed consideration of the various technical applications of electricity to land and submarine telegraphy, the telephone, electric lighting, and the electrical generation and transmission of power. Instruction is given by lectures and laboratory exercises upon the processes of photometry, especially as applied to the measurement of electric lights. Advanced instruction in electrical measurements, including work with dynamo-electric machinery, together with a course on the electrical testing of telegraph and telephone lines, is provided. The subjects of construction, specifications, and contracts also receive attention.

In addition to the various required and optional studies mentioned in the schedule of topics, students having the requisite preparation and ability may pursue more advanced courses in the mathematical theory of electricity and allied subjects. With this end in view, competent students may take the subject of differential equations as an extra study in the third year.

Besides the work done by the regular staff of the Institute, special instruction is given by gentlemen who are professionally engaged in various departments of electrical engineering, or especially conversant with certain branches of applied electricity. During the past year such instruction has been given by the following persons: —

Mr. George W. Blodgett, Electrician of the Boston and Albany Railroad, on the Application of Electricity to Railway Signalling; Mr. Hammond V. Hayes, of the American Bell Telephone Company, on the Construction and Operation of Telephone Lines; Mr. A. C. White, late of the Western Edison Electric Light Company, on Methods of Wiring for the Distribution of Electricity; Mr. C. J. H. Woodbury, of the Manufacturers' Mutual Fire Insurance Company, on Electric Lighting in connection with Fire Risks; Mr. Henry W. Blake, of the New York Street Railway Journal, on Street Railways; Mr. J. P. B. Fiske, of the Thomson-Houston Electric Company, on Electro-Motors; Mr. C. A. George, of the Boston Municipal Fire Alarm Telegraph, on Municipal Fire Alarm Systems; Mr. Maxwell Day, of the Thomson-Houston Electric Company, on the Thomson-Houston System of Arc Lighting;

and Captain A. de Khotinsky, of the Germania Electric Lighting Company, on the Manufacture of Incandescent Lamps.

The equipment of the laboratory includes a number of dynamo machines of various patterns, both arc and incandescent, devoted to purposes of instruction. Its facilities for instruction and research have been greatly increased by the recent gifts of a complete Edison plant for isolated lighting, including a 150-light dynamo, from Mr. Thomas A. Edison, and of a 9,600-watt, inclined coil, constant-potential dynamo, from the Thomson-Houston Electric Company. A 500-light Thomson-Houston alternating current machine, with convertors, also forms a part of the equipment. A 500-light United States direct-current compound dynamo is used for the purpose of lighting the Engineering Building, and is available for purposes of instruction.

In order to provide for the needs of students seeking instruction in Electrical Engineering beyond that given in the undergraduate course, an advanced course has been planned, with provision for the further study of the Mathematical Theory of Electricity, of Analytical and Applied Mechanics, including the Theory of Elasticity, the Dynamics of Rigid Bodies, and Hydrodynamics, and also of advanced Mathematics.

Chemical Engineering. — The special instruction upon this subject begins with an extended descriptive course of lectures giving a general view of Applied Chemistry. The chemical questions connected with the various chemical industries are discussed, and the mechanical appliances described, without entering into details of construction, which are reserved for a subsequent course dealing with materials, methods of transportation, evaporation and distillation, refrigeration, furnace construction, and similar topics, with special reference to the needs of the chemical industries. These topics are, so far as possible, taught by persons practically connected with the industries of which they treat. Special attention is paid to the discussion of the engineering problems of combustion, fuels, evaporation, boiler corrosion, etc., from a chemical point of view. The machinery and mechanical appliances used in manufacturing chemistry are also discussed at length from a

purely engineering standpoint. Thermo-Chemistry and the Chemistry of Fuels are considered in separate courses of lectures. A course of instruction is given in technical Gas Analysis, including the analysis of furnace and illuminating gases. The laboratory instruction consists of practice in the preparation and application of chemicals in the laboratory of industrial chemistry, and in a special study of the machines it contains. Particular attention is paid to comparative tests of various means and appliances used in chemical manufactures. Excursions are frequently made to various shops and manufacturing establishments.

The Engineering Laboratories. — The objects to be accomplished by these laboratories are the following: first, to give the students practice in such experimental work as engineers in the pursuit of their profession are called upon to perform; second, to afford some experience in carrying on original investigations in engineering subjects, with such care and accuracy as to render the results of real value to the engineering community; third, by publishing, from time to time, the results of such investigations, to add gradually to the common stock of knowledge.

These laboratories are situated in the Engineering Building, where they occupy the two lower floors, 50 x 150 feet each. The laboratory for testing the strength of materials is furnished with the following apparatus: an Olsen testing machine of fifty thousand pounds capacity, for determining tensile strength, elasticity, and compressive strength; a testing machine of the same capacity for determining the transverse strength and stiffness of beams up to twenty-five feet in length, and of framing-joints used in practice; machinery for the measurement of the twist of shafting; for testing the tensile strength of mortars and cements, and of ropes; for testing the effect of repeated stresses upon the elasticity and strength of iron and steel; for determining the strength and elasticity of wire; for determining the deflection of parallel rods when running under different conditions; also accessory apparatus for measuring stretch, deflection, and twist. Besides the above-stated apparatus, a horizontal Emery testing machine of 300,000 pounds capacity has recently been constructed for this laboratory

by William Sellers & Co., of Philadelphia. It contains all the essential features of the 800,000 pounds testing machine at the Watertown arsenal, built by Lieut. Albert H. Emery. The new machine is suitable for testing a compression specimen eighteen feet long, and a tension specimen twelve feet long, and will enable the department of Applied Mechanics to undertake and carry out a kind and amount of experimental investigation not otherwise possible, and to obtain a large number of results of value in practical engineering work, such as could not be obtained by means of machines of smaller capacity.

The hydraulic laboratory contains a closed steel tank five feet in diameter and over twenty-seven feet high, arranged for the insertion of orifices, mouthpieces, and other special pieces of apparatus, with gates for controlling the discharge, and with connections for supplying water, in experiments upon pipes and motors. This tank is connected with a ten-inch standpipe over seventy feet high, so arranged that a constant head may be maintained at any desired level. A steel tank of about 280 cubic feet capacity gives opportunity for the accurate measurement of larger quantities of water than can be weighed directly during experiments. A system of pipes connected both with the main tank and with the pumps is fitted for the insertion of diaphragms, branches, and other apparatus for studying loss of head and the laws of discharge. An attachment has been fitted to the main tank, containing a Pitot tube for studying the laws of velocity in jets, and adjustable points for accurate measurement of the cross-section of jets. The laboratory is further equipped with a variety of mercury gauges, weirs, standard orifices, mouthpieces, diaphragms, branches, nozzles, etc., for experiments with flowing water under all conditions. A six-inch turbine is arranged to be run under various conditions of head and gate opening in tests for efficiency.

The steam laboratory contains, a triple expansion engine, with cylinders of 9 inches, 16 inches, and 24 inches diameter respectively, and 30 inches stroke, arranged in such a way as to be run single, compound, or triple, as desired for the purposes of experiment. This engine is of the Corliss type, and has a capacity of about 150 horse-power when running triple, with an initial pres-

sure of 150 pounds, in the high-pressure cylinder. It is connected with a surface condenser and the other apparatus necessary to adapt it to the purposes of accurate experiment.

This laboratory also contains a 16 horse-power Harris-Corliss engine, and an 8 horse-power engine, used for giving instruction in valve setting, etc. It is equipped with several surface condensers, steam-pumps, calorimeters, mercurial pressure and vacuum columns; apparatus for determining the quantity of steam issuing from a given orifice or through a short tube under a given difference of pressure; apparatus for testing injectors; and with indicators, planimeters, gauges, thermometers, anemometers, and other accessory apparatus.

The engineering laboratories are provided with a number of friction-brakes; with machinery for determining the tension required in a belt or rope to enable it to carry a given power, at a given speed, with no more than a given amount of slip; with three transmission dynamometers; with a complete set of Westinghouse air-brake apparatus, including the parts belonging to the car and to the locomotive; with the pump and engineer's valve of the New York air brake; with an 8-inch, a 12-inch, and a 48-inch weir for measuring water, also an orifice for the same purpose; with a locomotive link model; with a centrifugal pump and a rotary pump; with a hot-air engine; with a pulsometer; and with cotton machinery as follows, two cards, a drawing frame, a speeder, a fly-frame, a ring-frame, and a mule, as well as accessory apparatus. There are available for the purposes of experiment in connection with the work of these laboratories, a horizontal tubular boiler, and two large sectional boilers situated in the Rogers Building; also another boiler, a 40 horse-power Brown engine, a number of looms, and other apparatus in the workshops on Garrison Street.

Shopwork. — Practical instruction in the nature of the materials of construction, and in the typical operations involved in the arts, is considered a very valuable adjunct to the theoretical treatment of professional subjects. Workshops have been provided, and furnished with the more important hand and machine tools, so that the student may acquire a direct knowledge of the nature of metals and woods, some manual skill in the use of tools, and a thorough knowledge of

what can be accomplished with them. The shops are located on Garrison Street, and are equipped as follows : —

The carpentry, wood-turning, and pattern-making departments contain 40 carpenter's benches, 2 circular saw benches, a swing saw, 2 jig saws, a buzz-planer, a mortising-machine, 36 wood-lathes, a large pattern-maker's lathe, and 36 pattern-maker's benches. The foundry contains a cupola furnace for melting iron, 2 brass furnaces, a core oven, and 32 moulder's benches. The forge-shop contains 32 forges, 7 blacksmith's vises, and 1 blacksmith's hand-drill. The machine-shop contains 23 engine lathes and 17 hand lathes of approved patterns, 2 machine-drills, 3 planers, a shaping-machine, a universal milling-machine, a universal grinding-machine, and 32 vise benches arranged for instruction in vise-work.

The John Cummings Laboratory of Mining Engineering and Metallurgy. — The aim of this laboratory is to furnish students the means for experimental study of the various processes of ore dressing and smelting, and at the same time to give them an idea of what is required of a professional miner or metallurgist. To this end the apparatus has been chosen with a view to illustrating, as far as possible, the principles of the more important machines and furnaces actually used in mining and metallurgy.

The metallurgy of lead, copper, gold, and silver has been chosen as the best suited for laboratory illustration. Production of iron and steel in quantity is precluded by the size of the plant requisite, and by the large amount of ores and fluxes necessary to put this into operation.

The experimental work of the laboratory is carried on by the students, under the immediate charge of an instructor. A sufficiently large quantity of ore is assigned to each student, who first examines it for its component minerals, sorts and samples it, determines its character and value by analysis and assay, and makes such other preliminary examinations as serve to indicate the proper method of treatment. He then treats the given quantity, makes a careful examination of the products at each step of the process, ascertains, wherever practicable, the amount of power, water, chemicals, fuel, and labor expended, and thus learns approximately

the effectiveness and economy of the method adopted. He learns also the value of chemistry as a check upon metallurgical work. Each student is assisted in working his ore by his classmates, who have opportunity in turn to manage the machines and furnaces.

It is not claimed that the instruction given in this laboratory is in any sense a substitute for the experience gained in large works. It is believed, however, that it prepares students to enter works and to be almost immediately useful in them. The spirit of investigation which is developed by the work, as well as the experience of comparing processes actually carried out with the same processes as described in books, is of great advantage.

The Mining Laboratory consists of three parts, devoted respectively to milling, smelting, and assaying. There are also a supply-room, a blowpipe-room, library, a private laboratory and office. Ample storage vaults for ores and fuel are provided.

The Milling-room is supplied with four suites of milling apparatus, as follows: a three-stamp battery, with a Hendy automatic feeder, a set of amalgamating plates, a mercury-saver, a Frue vanner with smooth and corrugated belts for concentrating tailings, a settling tank, and a centrifugal pump; a Blake Challenge crusher, a Gates crusher, crushing rolls, with automatic sizing screens, a Richards-Coggin separator, a spitzlutte, a spitzkasten, two Collom and one Harz-Mountain jig, a circular slime-table, a settling tank, and a centrifugal pump; one set of three amalgamating pans, 30, 18, and 12 inches in diameter, respectively, together with a 30-inch settler, another set of seven 7-inch pans, three of which are copper, and a small automatic kieve for separating mercury from pulp; a set of three 40-gallon leaching vessels, a set of four 8-gallon leaching vessels, and two dynamos for deposition of metals.

The laboratory contains also the following auxiliary apparatus: a steam-engine, a Bogardus mill, a ball mill, a Root blower, a Sturtevant dust-fan and blower, drying-tables, a Hendrie and Bolthoff sample-grinder, and four Morrell agate mortars.

The Furnace-room contains a water-jacket blast-furnace, a Brückner cylinder, two reverberatory roasting furnaces, a roasting kiln, a furnace with movable hearth for agglomerating, cupelling, and copper-refining, pot-furnaces, a blacksmith's forge, a melting-kettle, retorts, etc.

The Assay-room contains ten crucible furnaces, 12 x 12, all of which are jacketed with iron shells to insure good draught, stability, and durability; also two muffles 4 x 7, and five muffles 7 x 12. These furnaces are all provided with ample flue capacity and abundant draught. This room contains also eight pulp-balances, six flux-balances, nine button-balances, and desks for fifty students.

Summer Schools of Mining and Metallurgy. — To bring the mining students into closer acquaintance with their profession, summer schools are organized for the study of mines, mills, smelting works, and geological fields.

Previous to 1888, parties had travelled from place to place, making special studies of short duration at each. Since that time, the school has been located each year at a single point, rendering more thorough and detailed study possible.

In June, 1889, the summer school of Metallurgy was held among the anthracite iron furnaces of the Lehigh Valley and the coke furnaces of Lebanon, Steelton, and Baltimore.

In 1890, the summer school of Mining was held at the iron mines at Ishpeming, Mich.

In 1891, the summer school of Metallurgy was held at Pittsburgh; Bergen Point, N. J., and Bethlehem, Pa., being visited on the way.

In 1892, the summer school of Mining was held at the anthracite mines at Drifton, Pa., where excellent opportunities were afforded for the study of underground and surface operations of mining, as well as for practice in underground and surface surveying.

The mining and metallurgical summer schools take place in alternate years.

Architecture. — The instruction in this department comprises the study of construction and materials, the study of building processes and of professional practice, as well as that of composition and design, and of the history of architecture. It is arranged to meet the wants both of those who commence their professional studies at the beginning, and, to some extent, of experienced draughtsmen who desire to make up deficiencies in their training,

or to qualify themselves for undertaking the responsibilities of practice.

The more strictly professional work begins with the study of the Five Orders and their applications, and of Architectural History; while, with constant practice in drawing, the students are familiarized with the material elements of their future work by a course in practical construction, illustrated by lectures, problems, and by visits to buildings. The subject of specifications and contracts is discussed. Problems in construction of all kinds are given, to fix in the memory the principles already learned.

For two and one half years the students are continually engaged upon architectural design. Each set of drawings is examined and criticised before the classes by a jury from the Boston Society of Architects. Instruction is also given in sketching in black and white, and in water-color; and classes are held during the winter for drawing, both from life and from the cast, to which the advanced students of the department are admitted.

The Boston Society of Architects has established two prizes of the value of fifty dollars each, in books, for students who, at the end of the year, exhibit the best work.

Several thousand photographs, prints, drawings, and casts were originally collected for the department, by means of a special fund raised for the purpose. To these collections large additions have been made, at first mostly by gifts, but later by regular appropriations. Models and illustrations of architectural detail and materials are arranged in the rooms of the department. The chief part of the collection of casts of architectural sculpture and detail belonging to the department has been deposited in the Museum of Fine Arts, together with the architectural collections belonging to the Museum. The students of the department have free access to the Museum at all times; as the building is close at hand, no inconvenience results from the change, and the advanced exercises in drawing are held there. The museum of sanitary and building appliances contains models of plumbing apparatus, specimens of metal-work, tile-work, glass-work, and wood-work, partly purchased, but mostly deposited with the department by the manufacturers. The architectural library contains a carefully selected collection of tech-

nical works and the leading periodicals, both American and foreign. The publications of the Royal Institute of British Architects and of the Société Centrale des Architectes in Paris are presented by those institutions. The resources of the department have been much enlarged by the erection of the Architectural Building, which contains more than double the space heretofore available.

Biology. Under this head is included instruction in a series of related subjects beginning with Microscopy, and General Biology and extending to Comparative Physiology, Zoölogy, and Sanitary Biology.

General Biology is taught partly as an introduction to the special branches of the subject, which depend more or less upon it, and partly for its own sake, bringing before the student a new department of science. Beginning with a brief review of the familiar facts of common knowledge concerning living things and lifeless things, their likeness and their difference, and of organisms, organs, and tissues, the more recondite subjects of cells and protoplasm are considered; after which, considerable time is spent upon a thorough examination and comparison, both macroscopic and microscopic, of a particular plant (the common brake) and a particular animal (the earth-worm), chosen as representative forms. Here also the elements of practical microscopy are necessarily acquired, although distinct courses in Microscopy are given, chiefly to students in Chemistry and Physics.

General Biology is succeeded and continued by a somewhat longer course in the Biology of the Micro-organisms, in which the simplest forms of life, from one-celled organisms, like yeast, bacteria, and infusoria, upward, are studied and compared. This course naturally introduces the student to Cryptogamic Botany, of which the outlines only are taught, and to Zoölogy (including Palæontology), in which larger opportunities are offered. The elements of Anatomy and Embryology are taught by an extended course in Comparative Anatomy and Embryology, in connection with which the arts of dissection and histology are acquired.

The instruction in Zoölogy is given by lectures and laboratory work, and by occasional visits to museums and to the seashore.

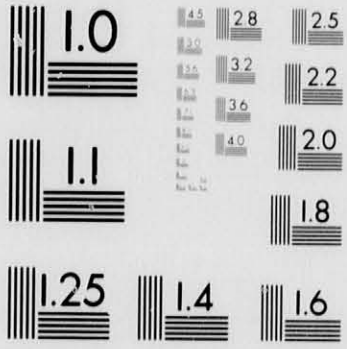
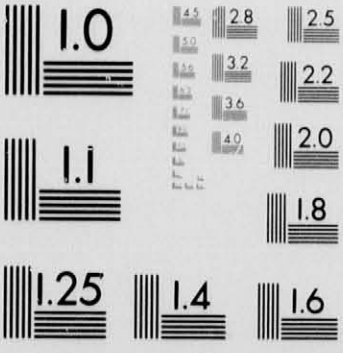
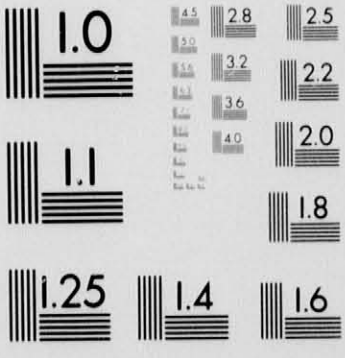
Excursions are occasionally made to Wood's Holl (where are located the Marine Biological Laboratory and the extensive aquaria, laboratories, and fish-hatching establishments of the United States Fish Commission), to Beverly Bridge, and to other points.

Students in the course in Biology are allowed, in the fourth year, much choice of special work, and are expected to undertake original investigation in their specialties. The subjects offered at present for such specialization are Comparative Physiology (including Microscopic Anatomy) and Sanitary Biology (including Bacteriology). For supplying the needs of students in either of these subjects, the department of Biology is now fully prepared, and some of the apparatus available is enumerated in the next paragraph. Special attention is given to the new and rapidly developing science of Bacteriology, particularly in its latest applications to sanitary science in the examination of air, ice, and water.

The organisms peculiar to or infesting water works are particularly considered, owing to their practical importance.

A biological Journal Club, to which the more advanced students are admitted, is found helpful as a means of keeping abreast of current progress, and of giving practice in bibliography and the public presentation of original matter or of abstracts. Students of biology have also valuable privileges in connection with the Boston Society of Natural History, of which the museum, the library, etc., are freely accessible.

The Biological Laboratory is furnished with tables for microscopical work, for dissection, and for the simpler operations of physiological chemistry. The students are supplied with Zeiss or Hartnack microscopes, work-tables, and lockers. The laboratory instruments include Thoma, Schanze, and Minot microtomes a long-roll kymograph, Du Bois-Reymond induction machine, a rotating drum for smoked paper, a pendulum myograph, moist chambers, culture rooms, sterilizers, thermostats, special microscopes and other bacteriological apparatus, etc. Frog-tanks and aquaria are also provided. The biological library includes the ordinary text-books and works of reference, and many important monographs, containing in all more than twelve hundred volumes.


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Sanitary Science. — The Institute now affords unusual opportunities for advanced work in hygiene and sanitary science. The departments giving the principal instruction in the sanitary sciences are the biological, chemical, physical, architectural, and that of sanitary engineering.

Graduate or special students, such as physicians, inspectors of boards of health, superintendents or other attachés of water works or sewer departments of cities or towns, if qualified to pursue their work with advantage, will be admitted to such subjects as they may elect, and will be given every opportunity to perfect themselves in their work.

Mineralogy. — Crystallography is taught with the aid of models, diagrams, and a series of crystals. In Descriptive Mineralogy specimens are freely used, an example of each of the more important species being placed before each student, while a collection of typical specimens is always accessible. The collection in this department is supplemented by that in the Museum of the Boston Society of Natural History, as explained in the next section. In Determinative Mineralogy students are taught to identify minerals by their crystallization and physical properties, as well as by blowpipe or chemical tests. The instruction in Blowpipe Analysis is supplemented by sufficient practice to insure familiarity with the methods.

At the close of the term an excursion of several days is made to localities of mineralogical interest in New England and the adjoining States.

Physical Geography and Geology. — The topics of these closely allied sciences are taught in the order of their logical succession, as follows : —

Physical Geography. — The course is not a repetition of what may have been taken at a good preparatory school. The position of the study as a general science is recognized, while the relations of the great terrestrial forces to engineering, commerce, manufacturing, and other branches of industry receive the special attention they should have in a technological institution.

As the forces mentioned are likewise geological agents, and it is through them alone that the student can interpret the structure of the earth, it is in this connection that Dynamical Geology is taught, as directly preparatory to the courses which follow. The instruction consists essentially of a course of lectures; but at each exercise questions are asked, to which answers are given either orally by a few, or are written by all the members of the class. The students are required to take notes and present them for examination. The lectures are amply illustrated.

Structural Geology. — Petrology, embracing the principal structural features of large masses of rocks, such as stratification, joint-structure, faults, folds, slaty-cleavage, veins, dikes, etc., is taught as concretely as circumstances will allow. Specimens, as well as diagrams and other illustrations, are freely used in the class-room, and the unusually favorable opportunities which the local geology of Boston presents for the illustration of these topics are utilized by means of frequent field-lessons.

In the instruction in Lithology, or the systematic study of rocks, a large amount of observation or laboratory work is combined with oral instruction. At each lesson a tray containing a typical hand-specimen of every type to be studied is placed before each student, and the lessons consist largely in the examination, testing, and description of the specimens by the students themselves, the instructors directing and supplementing the work of the class. The collections in this department are specially adapted to the laboratory method of instruction, and a complete series of typical rocks is accessible to students at all times. The instruction in Chemical Geology is also introduced in this term, and embraces the formation, alteration, and decay of rocks, the origin of vein-stones and ore-deposits, of rock-salt and mineral waters, and of coal and petroleum.

Historical Geology. — It is intended in this study to give the students a general idea of the physical history of the earth, and to teach some of the technical applications of this branch of knowledge. The students in the department of Civil Engineering constitute a distinct class. With these, special attention is given to such events in the history of the earth as have largely determined those topographic and hydrographic features of its surface with

which their professional labors may be more or less intimately associated.

With other students more time is devoted to the life of the past ages, to the relations of life to physical conditions, and to the geologic events which have led to the present distribution of organic beings upon the earth.

To impart information is regarded as but one portion of the instruction; so far as practicable the students are led to a direct acquaintance with natural features and objects, and then trained to employ correct methods of interpretation and presentation. The collections are especially adapted for use in teaching, and every available opportunity for field-practice is improved. There is a special geological library.

In addition to the working collections in the Rogers Building, the students in this department have access at all times to the extensive and valuable mineralogical and geological collections of the Boston Society of Natural History. These are very conveniently placed, and have been arranged with special reference to the needs of students, each division of mineralogy and geology being separately and fully illustrated in the same order in which it is taken up in the Institute course.

In all the courses in Mineralogy and Geology especial prominence is given to the practical and economic aspects of these sciences, the main object being to adapt the instruction in each case to meet the special demands of the student's profession, whether it be Mining Engineering, Civil Engineering, Architecture, Geology, Biology, or Chemistry. The Architects, for example, receive a course in which the study of building stones is the prominent feature, and in which the regular exercises are supplemented by visits to quarries, stoneyards, buildings, and monuments, and by laboratory practice in physical and chemical tests of the strength and durability of stones.

The fourth-year courses in Economic Geology and Ore Deposits are based upon extensive special collections, and are designed to prepare the students in Geology for professional work in connection with mines and quarries, including the selection and testing of materials for structural purposes and for industrial processes. In

addition to frequent field-lessons during term time, students in these courses spend about ten days of the semi-annual vacation with an instructor in some mining district, making a practical study of the modes of occurrence and structural relations of the economic materials, as well as of the methods of mining, etc.

All students in the Geological Course are also expected to devote four weeks in the summer vacation following the third year to field-work in connection with the summer school of Topography and Geodesy.

Climatology. — The elements of physical science, which are fundamental in the study of Meteorology, are taught in the course in Physics; and in the physical laboratory the students have some practice with the ordinary meteorological instruments. The course in Climatology is introduced with a general outline of Meteorology, and concluded with a discussion of the known influences of climate upon the nature and distribution of plants and animals, upon the resources of countries, and upon the health, vigor, and prosperity of communities and nations.

Military Science and Tactics. — In conformity with the requirements of the Acts of Congress of July 2, 1862, and Aug. 30, 1890, and of the Acts of the General Court of Massachusetts in furtherance thereof, the Institute provides instruction in military tactics. All students who take two or more first-year studies are required to attend, three times a week, an exercise in tactics, unless specially excused by the Faculty. For the drill exercises they are required to provide themselves with uniforms, which are made from measure and by contract, in order to secure uniformity of material and manufacture, as well as cheapness. The whole cost to each student does not exceed eighteen dollars. A written and a drill examination are held at the middle and end of the year. Applications to be excused from drill may be granted by the Faculty when the student is an alien, a college graduate, or over twenty-one years of age at entrance, when he presents satisfactory evidence of physical disability, or is able to pass a satisfactory examination in tactics and the duties of a line officer. Applications

for excuse from drill for any other reason than physical disability must be made within ten days after entrance.

The drill-hall includes a gymnasium, open to all students in the Institute. Class and individual work are conducted under the guidance of an experienced instructor.

Libraries. — The library of the Institute contains twenty-six thousand volumes and several thousand pamphlets. It is divided into a general library, containing certain books of reference, and nine department libraries, which contain a careful selection of text-books, special treatises, monographs, etc., and of periodical publications germane to the work of the respective departments. They are thus working libraries, accessible to all students; and valuable experience in the use of them is acquired before the completion of the regular courses, either incidentally to the preparation of theses, or in connection with lectures or recitations. The division of the library enables each student to consult the works needed by him with the least possible inconvenience and loss of time.

The students have full use also of the valuable library of the Boston Society of Natural History, of the extensive collections of the Boston Public Library, comprising more than five hundred thousand volumes in all departments of knowledge, and of the library of the American Statistical Association.

Many libraries of scientific societies, of individuals, and of private corporations, rich in complete sets of the scientific periodicals of all countries, and of the publications of leading scientific societies throughout the world, are, through the courtesy of the owners, open to advanced students of the Institute.

SCHEDULE OF TOPICS.

THE following twenty-seven pages form a schedule which includes the larger part of all the distinct topics or subjects of study taught in the Institute. These subjects are classified under headings, such as "Mathematics," "Chemistry," "Physics," "Civil Engineering," "Mining Engineering," etc. In the first column of the table is given the numeral by which any given topic is designated for convenience of reference, the same numbers appearing in the course schedules, pages 27 to 53; in the second column, the name of the subject; in the third, the manner in which it is taught, whether by lectures, by recitations, or by work in the laboratory, drawing-room, or field, or by several of these in conjunction; in the fourth, the name of the professor or instructor in charge of the exercise; in the fifth, the courses including this subject; in the sixth and seventh, the term (1st or 2d) and number of the year (1st, 2d, 3d, or 4th) in which the subject occurs; in the eighth and ninth, the number of weeks and of hours per week given to exercises in the subject; and in the tenth, the number of the preparatory subject or subjects required of those desiring to be admitted to the topic in question. These requirements include not merely the subjects specified by number, but also those required as preparation for them. Thus, for instance, the requirements for 51 (Applied Mechanics) are 32 and 300; that for 32 is 29; that for 29 is 27; that for 27 is 22; those for 22 are 20 and 21; those for 20 and 21 are 1, 2, and 3 (the admission requirements in arithmetic, algebra, and plane geometry); that for 300 is 22 (or 23), which has already been followed through. So that, to take up the topic 51 in Applied Mechanics, the applicant must be prepared to pass, or must have passed examinations, in 20, 21, 22, 27, 29, 32, 300, and in 1, 2, and 3. The sufficient reason for this is, that in topic 51 use is made of all of the subjects referred to;

and. to carry on the work, the student must have had suitable training in all of them, and must give satisfactory evidence, by examination or otherwise, that such is the case. In the tenth column the numbers are in some cases in italics. This denotes that the corresponding topics, if not previously completed, must be taken at the same time with the topic under consideration. For instance, the student cannot take 420, Mechanism, unless he takes 27 and 75 at the same time, or has already completed them. Roman numerals in parentheses in the fifth column designate courses for which the topic in question is optional.

By a careful consideration of the schedule, in connection with the pages on the "Subjects and Methods of Instruction" (pages 67 to 101), the applicant for a special course may select for the earlier part of that course such topics as will enable him to pursue later those more advanced subjects which he may particularly desire. He may also ascertain what preparatory training is requisite for admission to the Institute.

The topics included in the schedule are subject to change at any time by action of the Faculty; and the list of studies for which any special student applies must be submitted to the Faculty for approval.

Subjects numbered from 1 to 6 are the entrance requirements, full statements of which are given on pages 57 to 61.

1. ARITHMETIC.
2. ALGEBRA.
3. PLANE GEOMETRY.
4. FRENCH OR GERMAN.
5. ENGLISH.
6. HISTORY.

MATHEMATICS.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
20	Algebra	Rec.	Wells, Bartlett, Bailey, Greenlaw, George, Passano, Metzler	All reg. students .	1	1	7	4	(1) (2) (3)
21	Solid Geometry	Rec.	Wells, Bartlett, Bailey, Greenlaw, George, Passano, Metzler	All reg. students .	1	1	8	4	(1) (2) (3)
22	Logarithms and Plane and Spherical Trigonometry .	Rec.	Wells, Bartlett, Bailey, Greenlaw, George, Passano, Metzler	All courses except VII. and IX. .	1	2	10	5	(20) (21)
23	Logarithms, Plane Trigonometry; Elements of Plane Analytic Geometry.			VII., IX.			5	4	
27	Plane Analytic Geometry . .	Lect., Rec.	Runkle, Bartlett, Skinner, Bailey, Greenlaw, George.	All courses except VII. and IX. . .	2	1	15	3	(22)
				(IX.)	3				(23)
28	Plane Analytic Geometry* .	Lect., Rec.	Skinner	VII., IX.	2	1	2	5	(22)
29	Differential Calculus . . .	Lect., Rec.	Runkle, Osborne, Bartlett, Skinner .	All courses except VII., IX. and XII.†	2	2	15	3	(27)
				(IX.)	3				

* Not given after the present year. † Optional in V.

MATHEMATICS.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
30	General Theory of Equations	Lect., Rec.	Skinner	(VIII.)	2	2	15	2	(22)
31	Determinants	Lect., Rec.	Osborne	(VIII.)	2	2	15	1	(22)
32	Integral Calculus	Lect., Rec.	Runkle, Osborne, Skinner, Bailey	All courses except VII., IX. and XII.*	3	1	5	4	(29)
				(IX.)	4		10	2	
35	Differential Equations	Lect., Rec.	Bailey	VIII.	3	1	10	3	*(32)*
37	Advanced Algebra and Trigonometry	Lect., Rec.	Osborne	(VIII.)	3 or 4	1	15	2	(22)
38	Analytic Geometry of Three Dimensions†	Lect., Rec.	Osborne	(VIII.)	3 or 4	1	15	2	(29) (31)
39	Advanced Calculus†	Lect., Rec.	Bailey	(VIII.)	3 or 4	2	15	2	(31) (32)
40	Quaternions	Lect., Rec.	Bailey	(VI.)	4	2	15	2	(32)
				(VIII.)	3 or 4				
42	Theory of Probability and Method of Least Squares	Lect., Rec.	Bartlett	I_3, VI., VIII.	4	1	15	2	(32)
43	Differential Equations	Lect., Rec.	Osborne	I_3, VI.	4	2	15	3	(32)

NOTE. — Numbers in italics in the last column indicate subjects which must be taken in connection with that in question.

* Optional in V.

† Not given during the present school year.

ANALYTICAL AND APPLIED MECHANICS.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
49 50	Analytical Mechanics	Lect. Rec.	Lanza	VIII.	3 4	2 1, 2	15 30	3 3	(35) (300)
51	Statics, and Stresses in Frames	Lect. Rec.	Sondericker	I., II., III., IV., VI., X., XI.,	3	1	10	2	(*32*) (300)
52	Strength of Materials; Kinematics and Dynamics	Lect. Rec.	Sondericker	I., II., III., VI., X., XI.,	3	2	15	3	(51)
53	Strength of Materials	Lect. Rec.	Sondericker	IV.	3	2	10	3	(51)
56	Strength of Materials; Theory of Elasticity	Lect. Rec. Lab.	Lanza, Miller	I., III.$_2$, XI.	4	1	15	3	(52)
57	Strength of Materials; Friction	Lect. Rec. Lab.	Lanza, Miller	II., III.$_{1, 3, 4}$, VI., X.	4	1	15	3	(52)
58	Strength of Materials	Lect. Rec.,	Lanza, Miller	IV.	4	1	7	3	(53)
59	Strength of Materials; Stability of Structures; Theory of Elasticity	Lect. Rec., Lab.	Lanza, Miller	II., III.$_1$, X.	4	2	15	3	(57)
60	Machinery and Motors	Lect. Rec.	Lanza	I.$_{1, 2}$,	4	2	15	3	(56)

NOTE. — Numbers in Italics in the last column indicate subjects which must be taken in connection with that in question.

DRAWING.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
70	Geometrical and Mechanical Drawing	Lect., Draw.	Faunce, Burrison, Rice, Robinson	All reg. students .	1	1	15	6	
71	Mechanical Drawing and Descriptive Geometry .	Lect., Rec., Draw.	Faunce, Burrison, Rice, Robinson	I., II., III., VI., X., XI. . . .	1	2	15	6	(21) (70)
72				IV.	1	2	15	13	
73	Mechanical Drawing . . .	Lect., Draw.	Faunce, Burrison, Rice, Robinson	V., VIII., XII. .	1	2	15	6	(70)
74	Mechanical Drawing, (Chart and Map Making for IX.)	Lect., Draw.	Faunce, Burrison, Rice, Robinson	VII., IX. . . .	1	2	15	4	(70)
75	Descriptive Geometry . .	Lect., Rec., Draw.	Faunce, Rice . .	I., II., III.$_1$, $_2$, $_3$, VI., X., XI. .	2	1	15	5	(71)
80	Freehand Drawing . . .	Draw.	Adams	All reg. students .	1	1	15	1	
81	Freehand Drawing . . .	Draw.	Adams	All courses except IV.	1	2	15	2	(80)
82				IV.	1	2	15	6	
83	Freehand Drawing . . .	Draw.	Adams	IV.	2	1, 2	30	4	(82)
84	Freehand Drawing . . .	Draw.	Adams	IV.	3	1, 2	30	2	(83)
85	Freehand Drawing . . .	Draw.	Adams	VII.	3	1, 2	30	2	(81)

SHOPWORK.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
90	Carpentry and Wood Turning	Shop	Merrick	Special Class	1	1	15	9	
91	Pattern Work	Shop	Merrick	Special Class	1	2	15	6	(90)
92	Foundry Work	Shop	Merrick	Special Class	1	2	15	3	
93	Forging	Shop	Lambirth	Special Class	1	1	15	6	
						2	15	3	
95	Chipping and Filing	Shop	Lambirth	Special Class	1	1	15	3	
						2	6	3	
96	Machine Tool Work	Shop	Smith	Special Class	1	2	6	6	(95)
							9	9	
97	Carpentry and Wood Turning	Shop	Merrick	VI.	2	1, 2	30	2	
98				II. (VIII.) X.	2, 3, 4	1	15	4	
99	Pattern Work	Shop	Merrick	II.	2	2	15	2	(98)
100	Forging	Shop	Lambirth	II.	3	1	15	6	
101						2	5	4	
102				X.	4	2	15	3	
103	Chipping and Filing	Shop	Smith, Lambirth	II.	3	2	10	4	
104					4	1	4	6	
105	Machine Tool Work	Shop	Smith	$II._{1, 2, 3}$	4	1, 2	24	6	(104)
106	Metal Turning	Shop	Smith	VI.	2	1	15	2	
107				X.	4	2	15	2	
108	Foundry	Shop	Merrick	(II.)	2	2	15	2	

ENGLISH LANGUAGE AND LITERATURE.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
120	Rhetoric and English Composition	Lect., Rec., Com.	Carpenter, Dickinson, Herrick	All reg. students	1	1	15	2	(5) (6)
121	Logic	Lect., Rec.	Carpenter	IX.	1	2	15	2	(120)
125	English Literature	Lect., Rec., Com.	Dickinson	All courses except X. X.	2 3	1 2	15 15	1 2	(120)
128	English Literature to 1560	Lect., Read.	Carpenter	(IX.)	3	1	15	2	(125)
129	English Literature: 1560–1660	Lect., Read.	Herrick	(IX.)	3	2	15	2	(125)
130	English Literature: 1780–1860	Lect., Read.	Herrick	IX.	4	1	15	2	(125)

ENGLISH LANGUAGE AND LITERATURE.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
131	English Literature: 1660–1780	Lect., Read.	Carpenter	IX.	4	2	15	2	(130)
132	Contemporary English and American Literature	Lect., Read.	Carpenter	(IX.)	4	1	15	2	(125)
134	English Composition (advanced course)	Lect., Com.	Carpenter	(IX.)	4	2	15	2	(125)
135	English Composition	Lect., Com.	Herrick	II.	3	2	15	2	(125)
136	English Composition	Lect., Com.	Herrick	II.	4	2	15	2	(135)
137	English Memoirs (see 495)	Read.	Carpenter	$III._{1,2,3}$	4	1, 2	30	–	(125)
140	Latin Readings	Lect., Rec.	Dickinson	(IX.)	3	1, 2	30	2	

MODERN LANGUAGES.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
150	French (elementary)*	Lect., Rec.	Vogel	All reg. students not taking 160.	2	1, 2	30	3	
151	French (grammar and translation)	Rec.	van Daell, Bernard, Blachstein	All reg. students	1 or 3	1, 2	30	3	(4) or (150)
152	French (sight reading)	Rec.	van Daell	IX.	1	2	15	3	*(151)*
153	French, advanced	Lect., Rec.	van Daell	IX.	2	1, 2	30	3	(151)
154				IV.	4				
				(V.)	4	1	15	3	
155	French Literature	Lect., Rec.	van Daell	IX.	3	1, 2	30	3	(153)
160	German (elementary)*	Rec.	van Daell, Vogel, Blachstein	All reg. students not taking 150.	2	1, 2	30	3	
161	German (grammar and translation)	Rec.	Dippold, Vogel, Blachstein	All reg. students	3 or 1	1, 2	30	3	(4) or (160)
162	German (advanced)	Lect., Rec.	Dippold	(V.)	4	1	15	3	(161)
163				(IX.)	4	1, 2	30		
165	Spanish †	Lect., Rec.	Meyer	(IX.)	4	1, 2	30	2	
166	Italian †	Lect., Rec.		(IX.)	4	1, 2	30	2	

* Identical with entrance requirement. (See page 60.) † Given alternate years.

NOTE. — Numbers in Italics in the last column indicate subjects which must be taken in connection with that in question.

HISTORY.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
180	Political History since 1815.	Lect., Rec.	Levermore, Currier.	All reg. students.	1	2	15	2*	(6)
181	American History. . . .	Lect., Rec.	Currier.	All reg. students, except IX. and X. X.	2 3	1	15	2	(180)
182	Political History of England and the United States. .	Lect., Rec.	Levermore, Currier.	IX.	2	1, 2	30	3	(180)
185	History and Literature of the Renaissance and the Reformation	Lect., Rec.	Levermore, Currier.	IV., (VII.). . . . IX.	4 3	1, 2	30	2 3	(6)
186	History of the Era of the French Revolution. . .	Lect., Rec.	Levermore, Currier.	(IX.)	4	1, 2	30	2	(185)
187	Local United States History	Rec., Read.	. . . . .	(IX.)	4	1, 2	30	–	(181) or (182)
188	History and Elements of Philosophy	Lect., Rec.	Levermore. . . .	IX.	4	1	15	2	

* For students in Course IX., 3 hours.

ECONOMICS AND STATISTICS.

No.	Subject.	Lect., Rec., Lab., Draw. or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
200	Political Economy . . .	Lect., Rec.	Dewey, Currier . .	IX.	2	1	15	2	(180)
201	Economic Problems . . .	Read.	Dewey	IX.	2	1	15	1	(200) or (205)
205	Political Economy and Industrial History . . .	Lect., Rec.	Dewey, Currier . .	All Courses except II., III., IX., and X.	3	1	15	2	(181)
				III.$_4$, X.	4	2	15	1	
206	Statistics of U. S., and Graphic Methods . . .	Lect., Draw.	Dewey	IX.	3	1	10	2	(200)
207	Statistics of Sociology . .	Lect.	Dewey	(IX.)	4	1	15	3	(206) (212) or (213)
210	Financial History of the U. S.*	Lect., Rec.	Dewey	IX.	3 or 4	1	15	3	(200) or (205)
211	Commercial Geography*	Lect., Rec.	Niles	IX.	3 or 4	1	5	2	(200)
212	History of Commerce*	Lect., Rec.	Dewey	IX.	3 or 4	2	15	3	(182) (200)
213	History of Industry . . .	Lect., Rec.	Dewey	IX.	3 or 4	2	15	3	(182) (200)
214	Socialism and Co-operation .	Lect.	Dewey	(IX.)	3	2	15	2	(200) or (205)
215	Taxation and Administration	Lect., Rec.	Dewey	IX.	3 or 4	1	15	3	(201)
216	History of Economic Theory	Lect., Rec.	Dewey	(IX.)	4	2	15	2	(210) (215)

*Alternating subjects not given the present year.

POLITICAL SCIENCE.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
225	Social Science and History.	Lect., Rec.	Levermore . . .	IX. . . . . (VII.)	3 4	2	15	3	(615)
226	Comparative Politics and Constitutional History .	Lect., Rec.	Currier	IX.	4	1, 2	30	3	(225) (180) or (181)
227	International Law. . . .	Lect., Rec.	Levermore . . .	IX.	4	2	15	2	(226) or (181)
235	Business Law	Lect.	Brandeis	All courses except II., III., and X. III.$_4$, X.	3 4	1, 2	30	1	

CHEMISTRY.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
240	General Chemistry . . .	Lect., Lab.	Pope, Bardwell, Burns . . .	All reg. students .	1	1	15	7	(1) (2) (3) (4) (5) (6)
241 242	General Chemistry: Qualitative Analysis	Lect., Lab.	Pope, Bardwell, Burns . . .	I., II. . . . . III., V., VI., VII., VIII., X., XI., XII.	1	2	15	6	(240)
245	Theoretical Chemistry . .	Lect., Rec.	Talbot	III.$_3$, $_4$, V., VII., VIII., XII. . .	2	1	15	2	(242)

CHEMISTRY.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
246	Analytical Chemistry: Qualitative Analysis	Lect., Lab.	Drown, Talbot, Davenport	V., VII.	2	1	15	8	
247				VIII.				6	
248				X.				7	(*150*) or
249				XII.				4	(*160*) (242)
250				XI.	2	2	15	5	
251				III.$_{3,4}$	3	1	15	8, 9	
255	Analytical Chemistry: Quantitative Analysis	Lect., Lab.	Drown, Talbot, Davenport	V., VII., VIII.	2	2	15	7	(246) or (247)
257				X.				6	(248)
258				XII.				7	(249)
259				XI.	3	1	15	3	(250)
260				III.$_{3,4}$	3	2	15	10, 8	(251)
262	Organic Chemistry	Lect.	Norton	XI.	2	1	15	1	(242)
				VIII., X.	3				
265	Theoretical Chemistry: Chemical Change	Lect., Rec.	Noyes	V., VIII.	3	2	15	1	(245)
266	Industrial Chemistry	Lect.	Norton	V., X.	3	1, 2	30	2	(*151*) or (*161*) (255) or (257)
267	Industrial Chemistry	Lab.	Norton, Smith	(V.)	3	1, 2	30	6	(*266*)
268				X.	3	2	15	5	
270				VII.	3	1	15	9	(255)
271	Analytical Chemistry	Lect., Lab.	Drown, Talbot	V.	3	1, 2	30	12, 13	(255)
272				(VIII.)				6, 8	(255)
273				XII.				8, 9	(258)
274				III.$_{3,4}$	4	1	15	9, 7	(260)
						2	15	7, 12	

NOTE.—Numbers in Italics in the last column indicate subjects which must be taken in connection with that in question.

CHEMISTRY.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
277	Sanitary Chemistry	Lab.	Drown Mrs. Richards	(V.) VII., XI.	3 3	1 or 2 2	15	6	(255) or (259)
278 279 280	Organic Analysis	Lab.	Crafts, Noyes	V. (VII.) (VIII.)	4	1	15	7 6 6	(271) (270) (272)
281	Analytical Chemistry	Lab.	Drown	(V.)	4	1	15	12	(271)
282	Organic Chemistry	Lect.	Crafts	V., (VII.), (X.)	4	1, 2	30	2	(245) or (262)
284	Air Analysis	Lab.	Drown Mrs. Richards	XI.	4	1	15	2	(277)
285	Organic Chemistry	Lab.	Crafts, Noyes	(V.)	4	1	30	12	(*282*)
286	Industrial Chemistry	Lab.	Norton, Smith	(V.)	4	1	15	12	(255) (267)
287	Sanitary Chemistry	Lab.	Drown Mrs. Richards	(V.)	4	1	15	6	(271)
288	Textile Coloring	Lab.	Norton, Smith	(V.), (X.)	4	1	15	6	(267)
289	Applied Chemistry	Lect., Lab.	Norton	X.	4	1, 2	30	4, 9	(266)
290	Gas Analysis	Lab.	Drown, Gill	X. V.	4 4	1 2	15	1	(241) or (242)
291	Chemistry of Natural Waters	Lect.	Drown	XI.	4	2	15	1	(277)
292	Optical Analysis of Sugar	Lab.	Andrews	V.	4	2	15	1	(*282*)

NOTE — Numbers in Italics in the last column indicate subjects which must be taken in connection with that in question.

PHYSICS.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
300	Physics	Lect.	Cross	All reg. students	2	1, 2	30	3	(22)
301	Descriptive Astronomy	Read	Clifford	VIII	2	1	15	1	(22)
302	Acoustics and Electricity	Lect., Rec.	Clifford	VI., VIII.	2	1, 2	30	2	(22) (*300*)
303	Physical Laboratory	Lab.	Laws.	VI., VIII., IX.	2	2	15	[illegible]	(27) (*302*)
310	Physics: Heat	Lect.	Holman	All reg. students	3	1	8	2	(300)
311	Physical Laboratory	Lab.	Holman, Collins, Laws	All courses except IV., VI., and IX.	3	1 2	7 15	2	(23) or (27) (310)
312	Physical Laboratory	Lab.	Cross, Holman	VIII.	3	1, 2	30	1, 2	(303)
313	Physical Laboratory	Lab.	Holman, Collins, Laws	VI.	3	1, 2	7 15	2 3	(303)
314 315	Methods of Telegraphy	Lect.	Cross	VI., VIII.	3	1	5	3	(302)
316	Theoretical Electricity	Read.	Clifford	VI., VIII.	3	1 2	10 15	3 3	(302)
317	General Physics (Optics, Acoustics, or Heat)	Read.	Cross, Holman, Clifford	VIII.	3	1, 2	30	3	(302)
318	Electricity	Read.	Laws	(V.)	3	1	15	3	(300)
319	Electrical Measuring Instruments	Lect.	Holman.	(V.,) VI., VIII.	3	2	8 7	1 2	(315) or (318)
323	Electrical Measurements	Lab.	Puffer	III 4,	3 4	2 1	15 15	4 4	(311)
324	Advanced Physics (memoirs)	Read.	Cross	VIII.	4	1	15	1	(317)

NOTE. — Numbers in Italics in the last column indicates subjects which must be taken in connection with that in question.

PHYSICS.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
325	Physical Laboratory	Lab.	Holman, Collins	V.	4	1	15	2	(311)
326, 327	Physical Laboratory	Lab.	Cross, Holman, Puffer, Collins	I.$_3$ / (VI.,) (VIII.)	4	1 / 1, 2	15 / 15	2 / 5	(311)
328	Heat Measurements	Lab.	Holman	(X.)	4	1	15	4	(310)
329	History of Physical Science	Read.	Cross	VIII.	4	1	–	–	
330	Principles of Scientific Investigation	Read.	Cross	VIII.	4	1	–	–	
331	General Physics	Read.	Cross, Holman, Clifford	VIII.	4	1, 2	30	–	(32) (317)
332	Theory of Alternating Currents	Read.	Clifford	VI.	4	1	15	1	(316)
333	Electrical Engineering	Lect.	Cross	VI.	4	1, 2	15 / 15	4 / 5	(313) (316)
334	Telegraph Engineering	Lect., Lab.	Hayes	VI.	4	1	–	*	(313) (316)
335	Railroad Signals	Lect.	Blodgett	I.$_2$, VI.	4	1	–	*	(300)
336	Dynamo and Motor Testing	Lect.	Puffer	VI.	4	1	–	*	(313) (319)
337	Photometry	Lect.	Clifford	VI., VIII., X.	4	1	–	*	(313) (316)
338, 339	Heating and Ventilation	Lect.	Woodbridge	II. $_{1, 2, 3}$ / IV., XI.	4	1	15	1 / 2	(310)
340	Elements of Dynamo Machinery	Lect.	Cross	I., II., III.	4	1	–	*	(300)
341	Mathematical Electricity	Read.	Clifford	(VI.), (VIII.)	4	2	15	2	(32) (316)
342	Precision of Measurements	Lect.	Holman	VI., VIII.	4	2	10	1	(42)
343	Electro-Motors	Lect.	Fiske	III.$_2$, VI.	4	2	5	1*	(*333*) or (340)

*Time included in the assignment for 333.

CIVIL ENGINEERING.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
360	Surveying	Lect., Rec., Field. Draw.	Burton, Robbins, Stanwood, Foss	I., III.$_{2,4}$, XII. XI.	2	1, 2	30	6, 5 / 5, 6	(22) (71)
361	Surveying	Lect., Field.	Burton, Robbins	III.$_1$	2	1	15	4	(22) (71)
362	Topographical Drawing	Draw.	Burton, Robbins	I., III.$_{2,4}$, XI., XII.	2	1	15	2	(71) (81) *(360)*
363	Elements of Astronomy	Lect., Rec., Field.	Burton	I.	2	1	15	1	*(360)*
370	Surveying	Lect., Rec., Field. Draw.	Burton, Robbins,	I., XI., XII.	3	1, 2	30	2	(300) (362)
371	Surveying Instruments (six lessons)	Lect., Field.	Burton, Robbins	II.	3	2	–	–	(22) (71)
372	Railroad and Highway Engineering	Lect., Rec.	Allen, Foss	I., III.$_2$, XI.	3	1, 2	30*	2	*(32)* (362) *(373)* or *(374)*
373 374	Railroad Field-work and Drawing	Field. Draw.	Allen, Foss	I., III.$_2$, XI.	3	1 / 2 / 1, 2	15 / 15 / 30	4 / 5 / 2, 5	*(372)*

NOTE. — Numbers in Italics in the last column indicate subjects which must be taken in connection with that in question.
* In Course XI., 10 weeks in the first term, 12 in the second.

CIVIL ENGINEERING.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
375	Stereotomy	Lect., Draw.	Porter	I., XI.	3	1	15	4	(75)
376	Theory of Structures	Lect., Rec.	Swain	I., XI.	3	2	15	2	(52)
385	Railroad and Highway Engineering	Lect., Rec., Draw.	Allen, Foss	$I._2$	4	1, 2	30	3	(52) (373) (376)
386	Railroad Management	Lect.	Allen	$I._2$	4	1	15	2	(205) (372)
387	Geodesy and Practical Astronomy	Lect., Rec., Field.	Burton, Robbins	$I._3$	4	1 2	15 15	3 6	(32) (*42*) (370)
388	Geodesy and Practical Astronomy	Lect.	Burton, Robbins	$I._1$	4	1, 2	30	1	(32) (370)
389	Geodetic Surveying	Lect., Field.	Burton	XII.	4	1	15	2	(29) (370)
390	Theoretical Hydraulics	Lect., Rec.	Porter	I., $III._2$, XI.	4	1	15	3	(52)
391				II., $III._{1,3}$, VI., (X.)	4	1	7	2	
392	Sanitary and Hydraulic Engineering	Lect., Rec.	Porter	$I._1$, XI.	4	1	15	3	(52) (*390*) (*393*)
393	Hydraulic Measurements	Field. Draw.	Porter	$I._{1,3}$, $III._2$, (X.), XI., XII.	4	1	15	2	(390) or (391) for XII. (370)

NOTE. — Numbers in Italics in the last column indicate subjects which must be taken in connection with that in question.

CIVIL ENGINEERING.

No.	Subject.	Lect., Rec., Lab., Draw. or Field.	Instructor.	Taken by	Year.	Terms.	No. of Weeks.	Hours per Week.	Preparation Required.
394 395	Theory of Structures	Lect., Rec.	Swain, Stanwood.	I. III.$_2$	4	1, 2	30	2	(*56*) (376) (*56*)
396	Theory of Structures	Lect., Rec.	Swain	XI.	4	1 2	15 15	2 3	(*56*) (376)
397	Bridges and Similar Structures	Lect., Rec.	Swain	I.	4	1, 2	30	2	(*56*) (*394*)
398 399	Bridge Design	Draw.	Swain, Stanwood.	I.$_{1, 2}$ XI.	4 4	1, 2 1	30 15	6 4	(*394*) (*397*) (*396*)
400	Hydraulic Motors	Lect., Rec.	Porter	II.$_{1, 2, 3}$, (X.)	4	2	15	2	(391)
401	Hydraulic Engineering	Lect., Rec.	Porter	I.$_{1, 3}$, III.$_2$, XI.	4	2	15	3	(390) (393)
402	Engineering Laboratory	Lab.	Miller	I.$_{1, 2}$, XI.	4	2	15	3	(390)
403	Railroad and Highway Design	Draw.	Allen, Foss	I.$_2$,	4	2	15	2	(*385*) (*397*)
404	Sanitary and Hydraulic Designing	Draw.	Porter	I.$_1$, XI.	4	2	15	2	(392)

NOTE. — Numbers in Italics in the last column indicate subjects which must be taken in connection with that in question.

MECHANICAL ENGINEERING.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
420	Principles of Mechanism	Lect., Rec.	Merrill	II., III.$_{1,3}$, VI., X.	2	1	15	2	(27) (75)
422	Drawing	Draw.	Schwamb	II.	2	1	15	2	(420)
423			Schwamb	II., X.	2	2	15	6	(427)
424			Hamblet	III.$_{1,3}$	2	2	15	3	(428)
425			Hamblet	VI.	2	2	15	4	(429)
427	Mechanism: Construction of Gear-Teeth, Machine Tools, Cotton Machinery	Lect., Rec.	Schwamb, Merrill	II., X.	2	2	15	3	(420) (423)
428	Mechanism: Construction of Gear-Teeth, Machine Tools	. . .	Merrill	III.$_{1,3}$	2	2	15	2	(424) (425) (420)
429				VI					
430	Principles of Mechanism	Lect., Rec.	Merrill	I.	2	2	15	2	(27) (75)
433	Steam Engineering: Valve Gears, Boilers	Lect., Rec.	Peabody, Miller	II.	3	1, 2	30	3	(427) (438) (32)
434				III.$_{1,3}$					(428) (439) (51)
435				VI.					(429) (440) (52)
436				X.					(427) (441) (310)
438	Drawing, Design	Draw.	Peabody, Schwamb, Hamblet	II.	3	1, 2	30	6	(423) (433)
439				III.$_{1,3}$	3	1	15	5	(424) (434)
440				VI.	3	1	15	3	(425) (435)
						2	15	2	
441				X.	3	1	15	6	(423) (436)
						2	15	2	
443	Engineering Laboratory	Lab.	Miller	II., III.$_{1,3}$, VI., X.	3	2	15	2	(433) (434) (435) or (436)

NOTE. — Numbers in Italics in the last column indicate subjects which must be taken in connection with that in question.

MECHANICAL ENGINEERING.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
450	Steam Engineering	Lect., Rec.	Peabody	II., $III._1$, VI., X.	4	1	8	2	(433) (434) or (435) or (436)
451	Dynamics of Machines	Lect., Rec.	Lanza	II.	4	1	9	3	(433) (435) or (436) *(57)*
452				VI., X.	4	1	5	3	
453	Machine Design	Lect., Rec., Draw.	Schwamb	$II._{1,2,3}$	4	1	15	8	(433) (438) *(57)* *(451)*
454	Naval Architecture	Lect., Rec., Draw.	Peabody	$II._4$	4	1, 2	30	8, 6	*(461)*
455	Engineering Laboratory	Lab.	Miller	II., $III._1$, VI., X.	4	1, 2	30	4	*(400)* *(451)* (443) *(57)*
456									*(452)* *(391)*
457									*(452)* *(450)*
458									
459				$III._3$	4	2	15	4	(57) (434) (443)
460	Locomotive Construction	Lect., Rec.	Lanza	$II._2$	4	1	6	2	*(57)* *(391)* *(450)*
						2	15	3	*(451)*
461	Marine Engineering	Lect., Rec.	Peabody	$II._1$	4	1	6	2	*(57)* *(391)*
						2	15	3	*(450)* *(451)*
462	Mill Engineering	Lect., Rec.	Schwamb	$II._3$	4	1	6	2	*(57)* *(400)*
						2	15	3	*(450)* *(451)*
463	Technical Machinery	Lect.	Peabody	$III._{1,3}$, X.	4	2	15	2	(434) or (436)

NOTE. — Numbers in Italics in the last column indicate subjects which must be taken in connection with that in question.

MINING ENGINEERING.

No.	Subject.	Lect. Rec., Lab., D.aw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
480	Blowpipe Silver Assay . .	Lab.	Richards	III.$_{1,2,4}$, (III.$_3$) .	2	1	15	2	(242)
481	Mining Engineering . . .	Lect.	Richards, Hofman .	III.$_{1,2,4}$	3	1, 2	30	3	(300) (360)
				(XII.)	4	1	15	3	(560) (561)
482	Assaying by Fire	Lab.	Lodge	III.	3	2	15	4	(561)
483				V.	3	1	15	2	
484				XII	4	2	15	2	
487	Metallurgy of Iron . . .	Lect.	Richards	I.$_{1,2}$, II., III., V., X.	4	1	15	1	(241) or (242)
488	Metallurgy of Non-ferrous Metals	Lect.	Hofman, Howe . .	III., V., X., (XII.)	4	1	15	2	(561)
489	Mining	Lab.	Richards, Lodge . .	III.$_{1,2}$	4	1	15	8	(300) (482)
						2	15	12	
491	Metallurgy	Lab.	Richards, Lodge . .	(V.)	4	1	15	8	(270) (488) (300)
492				III.$_{3,4}$, ...	4	1,2	30	8,12	(274) (482)
493	Mining Engineering . . .	Lect.	Richards	III.$_{1,2,3}$ . . .	4	1	15	2	(300) (561)
				III.$_4$		1,2	30		
494	Metallurgy of Non-ferrous Metals and General Metallurgy	Lect.	Hofman	III., (X.) . . .	4	2	15	3	(488)
495	Memoirs (see 137) . . .	Read.	Richards, Hofman .	III.	4	1, 2	30	2	(489) (492)

NOTE. — Numbers in Italics in the last column indicate subjects which must be taken in connection with that in question.

ARCHITECTURE.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
510	Orders	Lect., Rec., Draw.	Homer	IV.	2	1	15	2	(72) (*83*)
511	Shades and Shadows	Lect., Draw.	Lawrence	IV.	2	1	15	1	(72) (82)
512	Perspective	Lect., Draw.	Lawrence	IV.	2	2	15	1	(511)
513	Materials	Lect.	Chandler	IV.	2	2	15	1	(71) or (72)
514	Design	Draw.	Homer, Lawrence	IV.	2	2	15	4	(510) (511) (*83*)
515	Pen and Ink	Draw.	Gregg	IV.	2	2	15	1	(*83*)
516 517	Architectural History	Lect., Draw.	Homer	IV.	2	2	30	1	(72) (82) (510) (*514*)
					3	1			
				(IX.)	3	2			
					4	1			
520	Specifications and Working Drawings	Lect., Draw.	Chandler	IV.	3	1	15	1	(513)
						2	15	2	
521	Stereotomy	Lect., Draw.	Homer	IV.	3	2	15	2	(72) or (75)
522	Design	Draw.	Létang	IV.	3	1	15	9	(514) (*84*) (*516*)
						2	15	15	

NOTE. — Subjects in Italics in the last column must be taken in connection with that in question.

ARCHITECTURE.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
523	Pen and Ink	Draw.	Gregg	IV.	3	1, 2	30	1	(515) (*84*)
524	Water Color		Turner	IV.	3	2	15	2	(*84*)
530	History of Construction	Lect.	Chandler	IV.	4	1	15	1	(520)
531	History of Ornament	Lect., Draw.	Walker	IV.	4	1, 2	30	½	(516) (83) (514) (522)
532	Advanced Design	Draw.	Létang	IV.	4	1	15	16	(522) (*531*)
						2	15	24	(*535*) (*536*)
534	Water Color		Turner	IV.	4	1, 2	30	2	(524)
535	Life Class	Draw.	Adams	IV.	4	1, 2	30	4	(84)
536	Graphical Statics	Lect., Draw.	Homer	IV.	4	1	8	2	(521) (58)
						2	7	2	
537	Business Relations, Contracts, etc.	Lect.	Chandler	IV.	4	2	15	1	(235) (520)
538	History of Painting and Sculpture	Lect.		IV.	4	2	15	1	(*516*) (522)
539	Modelling		Bartlett	IV.	4	2	15	2	(84)
540	Building Construction	Lect.	Chandler	$I._2$, XI.	4	2	15	1	

NOTE. — Subjects in Italics in the last column must be taken in connection with that in question.

NATURAL SCIENCES.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
560	Physical Geography . . .	Lect.	Niles	I., (III.$_1$,) III.$_{2,4}$, (V.), VII., IX., XI., XII.	2	2	15	3	(300) 1st term.
561 562	Mineralogy	Lect., Lab.	Crosby, Barton .	III., V., ... VII., XII. . . .	2	2	15	6	(242)
564	Building Stones	Lect., Lab.	Crosby	IV.	3	1	15	2	(240)
565	Structural Geology . . .	Lect., Lab.	Crosby	I., IV., IX., XI. .	3	1	15	2	(241) or (242)
563	Structural and Chemical Geology)	Lect., Lab.	Crosby	III.$_{1, 2, 4}$, (V.), VII., XII. . .	3	1	15	3	(560) (561)
567	Geological Field-work . .	Field.	Crosby, Barton .	XII.	3	1	15	4	(*566*)
568	Stratigraphic Geology . .	Lect., Rec.	Niles	III.$_{1,2,4}$,(V.), VII., IX., XII. .	3	2	15	3	(560) (565) or (566)
569	Historical Geology . . .	Lect., Rec.	Niles	I.	3	2	15	2	(560) (565)
570	Mineralogy	Lect., Lab.	Crosby, Barton .	XII.	3	2	15	4	(560) (561)
571	Geological Maps and Sections	Field. Draw.	Niles	XII.	3	2	15	2	(566) (567) (*568*)

NATURAL SCIENCES.

No.	Subject.	Lect., Rec., Lab., Draw., or Field	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
572	Palæontology	Lab.	Crosby	XII.	3	1, 2	30	2	(604)
580	Climatology	Lect., Rec.	Niles	(VII.), IX., XII.	4	1	15	2	(300)
581	Geological Field-work and Laboratory	Field. Lab.	Niles, Crosby. Barton	XII.	4	1 2	15 15	8 10	(567) (571)
583	Physiographic Geology	Lect., Rec.	Niles	XII.	4	1	15	3	(568) (571)
584	Geological Memoirs	Rec.	Niles	XII.	4	1, 2	30	1	(568)
586	Palæontology	Lab.	Niles	(XII.)	4	1	15	5	(568) (572) (600)
587	Economic Geology	Lect.	Crosby	XII.	4	1, 2	30	2	(566) (568) (570)
589	Micro-Lithology	Lect., Lab.	Barton	XII.	4	1, 2	30	3	(566) (568) (570)
590	Hydrography, including Tidal Phenomena	Rec.	Niles	XII.	4	2	15	3	(568) (571)

NATURAL SCIENCES.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
591	Ore Deposits	Lect.	Crosby	XII.	4	2	15	2	(566) (568) (570)
600 601 602	General Biology	Lect. Rec. Lab.	Sedgwick	VII., IX. XI. XII.	2 3 3	1	15	5 1 4	(240)
603	Microscopy	Lect. Rec. Lab.	Sedgwick	VII. (V.), VIII. XI.	1 2 3	2	15	2	(240)
604 605	Zoölogy	Lect. Lab.	Calkins	VII. XII. IX.	2 3 2	1, 2 2	30 15	2 2	(*601*) or (*602*)
606	Systematic Botany (Elementary)	Lect. Lab.	Burrage	VII., IX. XII.	2 3	2	15	1	(600) or (602)
610 611	Biology of the Micro-organisms	Lect. Rec. Lab.	Sedgwick	VII. XI.	3 4	1	15	2	(600) or (601)
612	Comparative Anatomy and Embryology	Lect. Rec. Lab.	Burrage	VII.	3	1 2	15 15	8 6	(600)
614	Physiology of the Senses	Lect. Rec. Lab.	Mathews	(VIII.)	3	1	15	2	(603)

NATURAL SCIENCES.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation Required.
615	Anthropology	Lect.	Sedgwick	VII., IX.	3	1	15	1	(604) or (605)
616	Cryptogamic Botany	Lect., Lab.	Calkins	VII.	3	2	15	6	(610)
620	Comparative Physiology	Lect., Lab.	Edes	VII.	4	1, 2	30	8, 7	(612)
622	Microscopic Anatomy	Lect., Lab.	Mathews	VII.	4	1, 2	30	6	(612)
624	Higher Biology	Lect.	Sedgwick	VII.	4	1, 2	30	1	(610) (612)
626	Physiology	Lect., Rec., Lab.	Sedgwick	IX.	4	1	15	2	(600)
627	History of Natural Science	Lect.	Mathews	VII.	4	1	15	1	(600)
628	Bacteriology	Lect., Rec., Lab.	Fuller	VII., XI.	4	1	15	4	(600) or (601)
629	Sanitary Science and the Public Health	Lect.	Sedgwick	I.,IV.,VII.,IX.,XI.	4	2	15	1	(240)
630	Sanitary Biology	Lect., Rec., Lab.	Sedgwick, Mathews	(VII.,) XI.	4	2	15	4	(628)
631	Water Purification and Sewage Disposal	Lect.	Sedgwick	XI.	4	2	15	1	(628)

REGULATIONS.

School Year. — The first term begins on the last Monday in September. There is a recess of one week after the semi-annual examinations, and the second term begins on the first Tuesday after Jan. 28. On legal holidays and on the Friday and Saturday following Thanksgiving Day the exercises of the school are suspended.

CALENDAR FOR 1892–93.

School year began	Monday, Sept. 26, 1892.
Second term will begin	Tuesday, Jan. 31, 1893.
Degrees conferred	Tuesday, May 30, 1893.
First Entrance Examinations	Thursday, June 29, 1893, and Friday, June 30, 1893.
Examinations for Advanced Standing	Wednesday, Sept. 13, 1893.
Second Entrance Examinations*	Tuesday, Sept. 19, 1893, and Wednesday, Sept. 20, 1893.
School year of 1893–94 will begin	Monday, Sept. 25, 1893.

CALENDAR FOR 1893–94.

School year will begin	Monday, Sept. 25, 1893.
Second term will begin	Tuesday, Jan. 30, 1894.
Degrees conferred	Tuesday, May 29, 1894.
First Entrance Examinations	Thursday, June 28, 1894, and Friday, June 29, 1894.
Examinations for Advanced Standing	Wednesday, Sept. 12, 1894.
Second Entrance Examinations*	Tuesday, Sept. 18, 1894, and Wednesday, Sept. 19, 1894.
School year of 1894–95 will begin	Monday, Sept. 24, 1894.

The Status of Students in regard to scholarship and ability to continue their courses is determined in part by means of examinations; but regularity of attendance and faithfulness to daily duties are considered essential.

* See page 57.

Examinations. — A semi-annual examination is held in January, covering all the studies of the preceding term; and an annual examination in May, covering, in the first, second, and third years, the studies of the entire year, except subjects finished during the first half-year, and in the fourth year, all the work of the year, and any professional work of previous years upon which it may be deemed best to hold examination.

Examinations for students conditioned in subjects of the first, second, and third years are held on the Wednesday, and following days, previous to the September entrance examinations, and, for the first year, at the time of the annual examinations; but candidates for graduation, conditioned at the semi-annual examination of the fourth year, are re-examined at such time previous to the first of March as may be appointed by the Faculty.

Intermediate examinations, the results of which are not made a matter of permanent record, may be held at any time in place of regular exercises.

Students conditioned in any subject and failing to make up the condition at the time appointed for the examination will not be allowed another examination, but will be required either to repeat the subject or to discontinue it, as well as all subjects dependent thereon, unless further time be allowed by special vote of the Faculty. A regular student failing entirely to make up any condition will cease to be regular, and his name will be transferred to the list of special students.

Students having clear records at the end of their first term are allowed to choose their courses without restriction. Students will not be admitted to professional work of the several courses without clear records in those previous subjects on which the former especially depend. Intermediate cases are treated by the Faculty on their individual merits.

Any special student attaining a proper standing in all subjects required of a regular student, up to any given period of the course, may apply to have his name transferred to the list of regular students.

Attendance Card. — At the opening of each term the

student should fill out and present to the Secretary an attendance card, blank forms for which will be supplied. The attendance card is the direct means by which the student places before the Faculty his wishes in regard to his course or selection of studies. The card must be presented at the earliest possible moment, to give opportunity for the immediate determination of qualifications and status. All subjects applied for must be regularly pursued, and no others can be taken except by special permission of the Faculty

Bond or Deposit. — Every student is required, on entering the school, to file with the Bursar a bond in the sum of two hundred dollars, signed by two responsible sureties, one of whom must be a citizen of the United States, as security for the payment of all charges of the Institute against him. If, for any reason, such a bond cannot be obtained, a deposit of fifty dollars may be accepted as security. No officer of instruction or student of the Institute will be received as a surety.

Fees. — The tuition fee for regular students is $200 per year, and must be paid in advance, as follows: $125 on or before October 10, and $75 on or before February 10. For one half or any less fraction of the school year, the fee is $125. Payment is also required of the cost of apparatus injured or destroyed in the laboratories, and of the cost of repair of damage by students to any other property of the Institute. Special students pay, in general, the full fee; but when a few branches only are pursued, and the time required for instruction is limited, some deduction may be made. The fee for students in graduate courses is the same as that for regular students.

It is desired that regular students, whose financial necessities are such as to prevent their continuance at the Institute, communicate, through the Secretary, with the Scholarship Committee of the Faculty

Payments. — All payments should be made to Albert M. Knight, Bursar. If by check, remittance from points out of New England should be in New York or Boston funds.

Scholarships and Fellowships. — *Sherwin Scholarship.* Founded by the English High School Association in memory of the late Thomas Sherwin. The pupil, to receive the privilege of this scholarship, is to be a graduate of the English High School of Boston and a regular student of the Institute.

Milton High School Scholarship. Founded by the contributions of residents of Milton. This scholarship will be conferred upon such former pupil of the Milton High School as the master of that school and the school committe of the town may select.

Joy Scholarships. The money by which these scholarships are sustained was given by Miss Nabby Joy. They were created pursuant to a decree of the Supreme Judicial Court of Massachusetts, for the benefit of one or more women studying natural science in the Institute. At present one scholarship only is available; a second will be established when the fund has increased sufficiently to warrant such an expenditure.

James Henry Mirrlees Scholarship. Founded by James B. Mirrlees, Esq., of Glasgow, Scotland, in memory of his son, who died in May, 1886, while attending the Institute. This scholarship will be awarded to a third or fourth year student in Mechanical Engineering.

Perkins Fund. By a bequest of the late Richard Perkins, of Boston, the income of fifty thousand dollars is available for aiding students in such amounts as shall be recommended by the Faculty.

State Scholarships. In consideration of aid received from the Commonwealth, the Institute has established twenty free scholarships, which are apportioned among the senatorial districts of the State. Information regarding the terms and conditions upon which these are to be awarded may be obtained by addressing the Secretary of the State Board of Education, Boston.

Charles L. Flint Scholarship. Founded by the late Charles L. Flint, of Boston. This scholarship is to be awarded, by preference, to a graduate of the Boston High School.

Farnsworth Scholarship. In 1889, this scholarship was founded by Mrs. Mary E. Atkins, of Boston, who has the right during her life to nominate the beneficiary.

Elisha T. Loring Scholarship. Founded by the late Elisha Thacher Loring, of Boston.

Coöperative Scholarships. The Coöperative Society of the students of the Institute applies its annual profits to the assistance of members of the Society, selected by its Board of Directors.

William Barton Rogers Scholarship Fund. The income from this fund, which was presented by the Alumni Association of the Institute as a memorial of the late President Rogers, is applied to aiding needy students.

Conditions governing award of Scholarships. — Scholarships are awarded in general only to those applicants who have completed at least a year of thoroughly satisfactory work at the Institute. The facts considered in making assignments are the needs of the student, and his promise as indicated by his previous work in the Institute. A student who is not greatly in need of aid cannot honorably apply for a scholarship, and none will be awarded to a student if, either from physical, mental, or moral weakness, he gives little promise of future usefulness. Awards will be made in October, and five eighths of the amount awarded will be credited on the term bill due in October, and the remaining three eighths on the term bill due in February. Applications for scholarships should be addressed to the Secretary of the Faculty.*

Graduate Scholarships. — Five scholarships for graduates of the Institute, carrying free tuition, have been established, and will be awarded to such applicants as are recommended by the Faculty.

In addition to these, the following fellowships carry two hundred dollars each in excess of the tuition fee : —

James Savage Fellowship Fund. Founded by the late James Savage, LL. D. Four hundred dollars from the income of this fund will be annually awarded to a graduate student of the Institute, or of some similar institution of equal standing. This sum will be awarded only to a student of distinguished ability engaged in the advanced study of some branch or branches of knowledge taught in the Institute.

*Applications for Massachusetts State Scholarships should be made to the Secretary of the State Board of Education.

Susan H. Swett Fellowship Fund. Four hundred dollars from the income of this fund will be annually awarded to a graduate student of the Institute, or of some similar institution of equal standing, who, by his character, capacity, training, and attainments, shall give evidence of special fitness to pursue advanced study in some branch or branches of knowledge taught in the Institute. The holder of this scholarship will be eligible to reappointment for a second year; and if in any year the sum above named cannot be advantageously used for the purpose prescribed, no appointment will be made.

For both of these fellowships the preference is given to graduate students who are candidates for advanced degrees.

Residence and Expenses. — As the exercises of the school begin at nine o'clock in the morning, and end before five o'clock in the afternoon, students may conveniently live in any of the neighboring cities or towns, on the lines of the various railroads, if they prefer to do so.

The cost of board and rooms in Boston and the neighboring cities and towns need not exceed seven to eight dollars a week. The cost of books, drawing instruments, paper, etc., exclusive of chemical breakage, is from twenty-five to thirty-five dollars a year.

Attendance. — Regular students are expected to attend all the exercises of their several courses. Special students are expected to attend all the exercises in subjects applied for on their attendance cards, unless excused by special vote of the Faculty. Students are in general, expected to devote themselves to the work of the school between the hours of 9 A. M. and 4 15 P. M., except during the interval from 1 P. M. to 2.15. There are no exercises on Saturday afternoon, and the rooms are closed.

Conduct. — While within the limits of the Institute students are expected to behave with decorum, to obey the regulations of the school, and to pay due respect to its officers. Every student will be held responsible for the furniture which he uses, and the cost of repairing any damage thereto will be charged to him. In case of

injury to the building, or to any of the furniture, apparatus, or other property of the Institute, the damage will be charged to the student or students known to be immediately concerned; but if the persons who caused the damage are unknown, the cost of repairing the same may be assessed equally upon all the students of the school. Conduct inconsistent with the general good order of the school, if repeated after admonition, will be followed by suspension or dismissal. It is the aim of the Faculty so to administer the discipline of the school as to maintain a high standard of integrity and a scrupulous regard for truth; and the attempt of any student to present as his own the work of another, or to pass any examination by improper means, is regarded as a most serious offence, rendering the offender liable to immediate expulsion.

REGISTER OF STUDENTS.

For residence addresses in surburban portions of Boston, the following abbreviations are used: —

A.	Allston.	M.	Mattapan.
B.	Brighton.	N.	Neponset.
C.	Charlestown.	S. B.	South Boston.
D.	Dorchester.	R.	Roxbury.
E. B.	East Boston.	Ros.	Roslindale.
J. P.	Jamaica Plain.	W. R.	West Roxbury.

GRADUATE STUDENTS.

Candidates for Advanced Degree.

Hopkins, Prescott Andrews S. B., Mass. Inst. of Technology.	*Newburyport*	140 Beacon St.
Meyer, Joseph Andrew, Jr. S. B., Mass. Inst. of Technology.	*Boston*	Studying abroad.
Sanborn, Frank Edwin S. B., Mass. Inst. of Technology.	*Boston*	College Hill.

NAME.	HOME.	RESIDENCE.
Abell, Edward Walter A. B., Yale University.	*Meriden, Ct.*	109 Chandler St.
Adams, Francis Mulliken Ph. B., Yale University.	*New Haven, Ct.*	108 W. Chester Park.
Allen, Annie Elizabeth A. B., Smith College.	*Cambridgeport.*	Cambridgeport.
Ames, John Worthington A. B., Harvard University.	*Cambridge*	Cambridge.
Banta, May B. S., Wellesley College.	*Brooklyn, N. Y.*	Wellesley.
Barr, Lawrence A. B., Harvard University.	*Boston*	275 Marlborough St.
Bartholomew, Ethel B. L., Iowa Agricultural College.	*Chariton, Iowa*	298 Columubus Ave.
Boutwell, Arthur Toull A. B., Amherst College.	*Andover*	Andover.
Brown, Thomas Morris B. A., Johns Hopkins University.	*Baltimore, Md.*	21 St. James Ave.

NAME.	HOME.	RESIDENCE.
Brown, Willard Dalrymple A. B., Harvard University.	*Lexington*	Lexington.
Bryant, Ernest Calvin B. S., Middlebury College.	*Manchester, N. H.*	151 Worcester St.
Codman, John Sturgis A. B., Harvard University.	*Boston*	57 Marlborough St.
Copeland, William Rogers A. B., Harvard University.	*Cambridge*	Cambridge.
Crafts, Walter Nathan A. B., Oberlin College.	*Oberlin, Ohio*	34 Claremont Park.
Day, Nathan Brown A. B., Harvard University.	*Boston*	280 Newbury St.
Deuson, Hugh Cowan B. C. E., University of Alabama.	*Gadsden, Ala.*	140 Chandler St.
Dyar, Harrison Gray S. B., Mass. Inst. of Technology.	*Roxbury*	49 Winthrop St.
Fernald, Robert Heywood B. M. E., Maine State College.	*Orono, Me.*	9 Temple St.
Foster, Mary Louise A. B., Smith College.	*Jamaica Plain*	709 Centre St., J. P.
Gilmore, Howard S. B., Mass. Inst. of Technology.	*No. Easton*	No. Easton.
Hart, Donald Purple Ph. B., Marietta College.	*Marietta, Ohio*	118 Charles St.
Kinney, Charles Noyes A. C., Drake University.	*Des Moines, Iowa*	676 Tremont St.
Lewis, Herbert B. A., Amherst College.	*Haverhill*	Haverhill.
Lowell, Guy A. B., Harvard University.	*Cambridge*	Cambridge.
Mann, Fred Maynard B. C. E., University of Minnesota.	*Minneapolis, Minn.*	129 W. Newton St.
Marble, Dwight Newcomb A. B., Centre College.	*Owensboro, Ky.*	138 Charles St.
Marshall, Albert Tisdale S. B., Worcester Polytechnic Institute.	*Brockton*	Brockton.
Mason, Elizabeth Spaulding A. B., Smith College.	*Boston*	164 W. Chester Pk.
McGoodwin, Henry Kerr B. S., Ogden College.	*Bowling Green, Ky.*	16 Durham St.
McKay, George Theodore A. B., Harvard University.	*Boston*	142 Marlborough St.
Nesbit, Arthur Fleming A. B., Lafayette College.	*Milton, Pa.*	273 Columbus Ave.
Newbegin, Parker Cleaveland A. B., Bowdoin College.	*Defiance, Ohio*	36 Yarmouth St.
Parnall, William E., Jr. S. B., Michigan Mining School.	*Calumet, Mich.*	221 West Canton St.

NAME.	HOME.	RESIDENCE.
Phillips, Charles Abbott . . . B. S., Northwestern University.	*Evanston, Ill.* . . .	387 Boylston St.
Quevedo, Narciso Tadeo . . . B. S., National Institute.	*Guatemala, C. A.* .	Worcester.
Raymond, Edward Lincoln . . A. B., Amherst College.	*Boston*	53 Gray St.
Roberts, Harold Barnes . . . S. B., Mass. Inst. of Technology.	*Boston*	81 Mt. Vernon St.
Roche, John Aloysious . . . A. B., St. John's College.	*Haverhill*	24 Clarendon St.
Sturgis, Edward . . . . . A. B., Harvard University.	*Manchester*	8 Chestnut St.
Thorndike, Sturgis Hooper . . A. B., Harvard University.	*Cambridge*	Cambridge.
Torossian, Toros Hovhanes . . B. A., Robert College.	*Roustchuk, Bulgaria* .	613 Tremont St.
Walker, George Lounsbury . . B. S., College of the City of New York.	*New York, N. Y.*	52 Union Park.
Weil, Isaac . . . . . Ph. B., Yale University.	*New York, N. Y.* .	17 Yarmouth St.
Westcott, William Read . . . A. B., Harvard University.	*Cambridge*	Cambridge.
Whitaker, Samuel Edgar . . . A. B., Boston University.	*Lynn*	Lynn.
Wright, James Hayden . . . A. B., Harvard University.	*Detroit, Mich.* . . .	39 Union Park.

REGULAR STUDENTS.

Fourth Year.

NAME.	COURSE.	HOME.	RESIDENCE.
Abbott, Frederic Bassett	VI.	*Lynn*	19 St. James Ave.
Albee, Orton Wheelock	III.	*Marlborough*	Marlborough.
Alden, Herbert Watson	II.	*Plymouth, N. H.*	56 Chester Sq.
Allen, Charles Vernon	VI.	*Holliston*	102 Pembroke St.
Anthony, John Gould	III.	*Cincinnati, Ohio*	83 Montgomery St.
Badger, Frank Sidney	I.	*Wellesley Hills*	Wellesley Hills.
Baker, Frederic Wallace	II.	*Charlestown*	59 Warren St., C.
Ballard, Hetty Orrilla	XII.	*Roslindale*	152 Brown Ave., Ros.
Barbour, Minard Townsend	II.	*Chicago, Ill.*	66 Chester Sq.
Barnes, William Thomas	I.	*So. Boston*	773 Broadway, S. B.
Beattie, Roy Hamilton	I.	*Fall River*	6 Louisburg Sq.
Bemis, Albert Farwell	I.	*Colorado Springs, Col.*	116 Huntington Ave.
Biscoe, Maurice Bigelow	IV.	*Newtonville*	Newtonville.
Blake, Edmund Enos	II.	*Newton*	Newton.
Blood, Grosvenor Tarbell	VI.	*Newburyport*	Newburyport.
Braman, Samuel Noyes	II.	*Wayland*	Wayland.
Brown, Glenn Charles	III.	*Tower, Minn.*	15 St. James Ave.
Brown, John Clifford	VI.	*Portland, Me.*	33 St. James Ave.
Bryant, Ernest Calvin, B. S.	I.	*Manchester, N. H.*	151 Worcester St.
Buchanan, Leonard Brown	VI.	*Woburn*	Woburn.
Buchholz, Charles Egmont	I.	*Philadelphia, Pa.*	35 St. James Ave.
Buck, Arthur Augustine	VI.	*Bucksport, Me.*	Chelsea.
Burke, John Ryan	I.	*East Boston*	119 Webster St., E.B.
Callahan, Dennis Edward	VI.	*Boston*	329 Federal St.
Carney, Edward Bullard	II.	*Lowell*	Lowell.
Carter, William Wood	X.	*Boston*	110 Dartmouth St.
Clapp, Harry Lincoln	X.	*South Boston*	18 Atlantic St., S. B.
Clapp, Wilfred Atherton	I.	*South Boston*	104 F St., S. B.
Codman, John Sturgis, A. B.	VI.	*Boston*	57 Marlborough St.
Cook, Charles Nourse	X.	*Woonsocket, R. I.*	41 Mt. Vernon St.
Cox, Frederick Edward	IV.	*St. Louis, Mo.*	80 Huntington Ave.
Craighill, Nathaniel Rutherford	II.	*Charlestown, W. Va.*	89 Appleton St.
Crosby, William Wyman	II.	*Woburn*	Woburn.
Darrow, Courtland Rogers	I.	*Waterford, Conn.*	102 Pembroke St.

NAME.	COURSE.	HOME.	RESIDENCE.
Davis, Albert Gould . . .	VI.	*Middlesborough, Ky.*	St. Botolph Hall.
Davis, Carleton Emerson .	I.	*Newton Centre* . .	Newton Centre.
Dawes, Herbert Nathan . .	II.	*Chelsea*	Chelsea.
Dearborn, George Knight .	IX.	*Boston*	6 Louisburg Sq.
Demond, Charles Denny . .	III.	*East Boston* . . .	166 Webster St., E. B.
Densmore, Edward Dana .	VI.	*Somerville* . . .	Somerville.
Dillon, Frederick Nathan .	V.	*Fitchburg* . . .	128 St. Botolph St.
Dixon, Laurence Belmont .	VI.	*Chicago, Ill.* . . .	56 Chester Sq.
Dodge, Samuel Douglass .	I.	*Arlington* . . .	Arlington.
Dolan, Peter Francis . . .	VI.	*East Boston* . . .	185 Chelsea St., E. B.
Dorman, Theodore Taylor .	X.	*Montclair, N. J.* .	372 Boylston St.
Emery, James Albert . . .	I.	*Wakefield* . . .	Wakefield.
Farwell, Arthur George . .	VI.	*St. Paul, Minn.* .	3 Union Park.
Fay, Frederic Harold . . .	I.	*Marlborough* . .	20 Rutland Sq.
Fitz, Charles Frederick, Jr. .	II.	*Watertown* . . .	Watertown.
Forbes, Fred Bettinson . .	V.	*W. Somerville* . .	W. Somerville.
Fowle, Arthur Edwin . . .	X.	*Newton Centre* . .	Newton Centre.
Frisbie, Walter Levi . . .	II.	*Waterbury, Conn.*	118 Chandler St.
Gamble, William Burt . .	IX.	*Detroit, Mich.* . .	26 St. James Ave.
Gaylord, Wallace Kendall .	V.	*Wellesley* . . .	Wellesley.
Gilmore, Howard, S. B. . .	VI.	*No. Easton* . . .	No. Easton.
Godchaux, Jules	II.	*New Orleans, La.* .	162 Huntington Ave.
Gorham, Marvine	II.	*Buffalo, N. Y.* . .	6 Louisburg Sq.
Hadley, Frederick Walter .	VI.	*Arlington Heights* .	Arlington Heights.
Hagar, Edward McKim . .	II.	*Chicago, Ill.* . . .	18 Harris Ave., J. P.
Hanchett, George Tilden .	VI.	*Hyde Park* . . .	Hyde Park.
Harvey, Frederic Hall . .	III.	*Galt, Cal.* . . .	6 Rutland Sq.
Hill, William Reed . . .	IV.	*Milton*	Milton.
Hinckley, John Fred . . .	X.	*Marlborough* . .	20 Rutland Sq.
Houck, William Gabriel . .	I.	*Buffalo, N. Y.* . .	314 W. Chester Park.
Howland, Frederick Hoppin	IX.	*Providence, R. I.* .	St. Botolph Hall.
Jackson, Daniel Dana . .	V.	*Lanesville* . . .	Newtonville.
James, Lawrence Stearns .	V.	*East Boston* . . .	56 Trenton St., E. B.
Jameson, Arthur Hugh . .	V.	*Woburn*	148 Chandler St.
Keith, Simeon Curtis, Jr. .	VII.	*E. Bridgewater* .	100 Pembroke St.
Kenison, Ervin	II.	*Chelsea*	Chelsea.
Keyes, Frederic Hale . . .	II.	*Newtonville* . . .	Newtonville.
King, Warren Dudley . .	VI.	*Peabody*	Peabody.
Knowlton, Willis Taylor . .	I.	*Malden*	Malden.
Lamb, William Franklin . .	VI.	*Roxbury*	23 Waumbeck St., R.
Lambert, Wallace Corliss .	I.	*Lowell*	Lowell.
Latey, Harry Nelson . . .	VI.	*St. Louis, Mo.* . .	216 W. Chester Pk.
Latham, Harry Milton . .	II.	*Stoneham* . . .	Stoneham.

NAME.	COURSE.	HOME.	RESIDENCE.
Lewis, Herbert, B. A.	VI.	*Haverhill*	Haverhill.
Logan, John Wood	II.	*Bala, Pa.*	Newtonville.
Maki, Heiichiro	VI.	*Tōkyo, Japan*	15 Claremont Pk.
Marcy, Willard Adna	II.	*Newton Upper Falls*	Newton Upper Falls.
McQuesten, George Edward	VI.	*Boston*	115 Newbury St.
Merrill, Frank Henry	X.	*Newburyport*	5 Oxford Terrace.
Mitchell, Benjamin Merwin	II.	*So. Britain, Conn.*	507 Columbus Ave.
Morss, Henry Adams	VI.	*Boston*	323 Marlborough St.
Nichols, Henry Windsor	XII.	*Cohasset*	44 Upton St.
Norton, Charles Ladd	VI.	*Springfield.*	11 Milford St.
Norton, Francis Cobb	IX.	*Rockland, Me.*	128 Huntington Av.
Nutter, Charles Latham	II.	*E. Bridgewater.*	220 W. Chester Pk.
Paine, Cecil Eric	II.	*Portland, Me.*	130 St. Botolph St.
Parce, Joseph Yale, Jr.	II.	*De Land, Fla.*	91 Waltham St.
Parker, Edwin Mason	IV.	*W. Acton*	W. Acton.
Parks, Oren Elisha	I.	*Westfield.*	1 Yarmouth St.
Patch, Walter Woodbury	I.	*Roxbury*	18 Savin St., R.
Phillips, Harry Milo	II.	*Keokuk, Iowa*	18 Yarmouth St.
Pickert, Leo Walter	V.	*Roxbury*	10 Greenville St., R.
Reed, James Henry, Jr.	VI.	*Boston*	3 Gloucester St.
Resor, William Seth	VI.	*Cincinnati, Ohio*	36 W. Cedar St.
Rice, Harry Lawson	X.	*Lawrence*	129 Dartmouth St.
Richardson, Frank Douglas	II.	*Oak Park, Ill.*	14 Gordon St., J. P.
Richmond, Harold Anthony	II.	*Providence, R. I.*	202 Dartmouth St.
Simonds, Frederic Pond	IV.	*Salem*	128 Marlborough St.
Skinner, Fenwick Fenton	I.	*Roxbury*	2849 Washington St.
Smith, Arthur Blakeley	IX.	*Providence, R. I.*	249 Berkeley St.
Smith, Frederick Dexter	I.	*So. Framingham*	So. Framingham.
Solomon, John Isaac	VI.	*New York, N. Y.*	142 St. Botolph St.
Speer, James Ramsey	II.	*Pittsburgh, Pa.*	St. Botolph Hall.
Spofford, Charles Milton	I.	*Georgetown*	67 St. Botolph St.
Stanwood, Herbert Winthrop,	II.	*Brookline*	Brookline.
Stose, George Willis	I.	*Pasadena, Cal.*	92 Chandler St.
Stowe, Lovell Baker	VI.	*Caryville.*	Caryville.
Studley, Fred Butler	VI.	*Rockland.*	731 Tremont St.
Sutter, Frederick Charles	VI.	*Detroit, Mich.*	St. Botolph Hall.
Swanton, Walter Irving	I.	*Gardiner, Me.*	17 Union Park.
Sweet, Kilburn Smith	I.	*Kenduskeag, Me.*	57 Chandler St.
Taintor, Charles Wilson	VI.	*Keene, N. H.*	Pond St., J. P.
Taylor, Charles Malcolm	II.	*Chelsea*	Chelsea.
Tenney, Winthrop Parker	VI.	*Dorchester*	Pleasant St., D.
Thomas, Alfred Clarence	VI.	*Cincinnati, Ohio*	36 W. Cedar St.
Thomas, Percy Holbrook	VI.	*Wayland*	Wayland.

NAME.	COURSE.	HOME.	RESIDENCE.
Tidd, Winthrop Lowe . .	II.	*Taunton*	18 Yarmouth St.
Tomfohrde, John Frederic .	II.	*Charlestown* . .	24 Mt. Vernon St., C.
Torossian, Toros Hovhanes, B.A.	I.	*Roustchuk, Bulgaria,*	613 Tremont St.
Tripp, Charles Albion . .	VI.	*Hudson*	112 Pembroke St.
Tucker, William Alfred . .	III.	*Roxbury*	48 Munroe St., R.
Vining, Louis Bradford . .	VI.	*Boston*	138 Huntington Ave.
Wadsworth, Augustus Baldwin,	VII.	*Plainfield, N. J.* .	128 Marlborough St.
Waldron, Samuel Payson .	I.	*Lancaster, N. H.* .	Somerville.
Walker, Charles Richard . .	V.	*Cambridgeport* . .	Cambridgeport.
Walker, George Lounsbury, B.S.	I.	*New York, N. Y.*	52 Union Park.
Wallace, Frederic Appleton .	II.	*Lynnfield* . . .	Lynnfield.
Wallis, Robert Norcross . .	IX.	*Fitchburg* . . .	519 Columbus Ave.
Waterman, Harry Cushing .	IV.	*Hanover*	Hanover.
Whitaker, Samuel Edgar, A. B.	VI.	*Lynn*	Lynn.
Wilder, Parker Hastings .	VI.	*Cincinnati, Ohio* .	112 Charles St.
Woodbridge, Jonathan Edwards	VI.	*Duluth, Minn.* .	25 Warren Ave.
Woods, Henry Tyler . . .	II.	*Boston*	224 Huntington Ave.
Yorke, George Marshall .	VI.	*Lowell*	Lowell.

Third Year.

Abbot, Charles Greeley . .	VIII.	*Wilton, N. H.* . .	265 Dudley St., R.
Abell, Edward Walter, A. B.,	VI.	*Meriden, Conn.* .	109 Chandler St.
Adams, Francis Mulliken, Ph. B.	VI.	*New Haven, Conn.*	108 W. Chester Park.
Adams, Raleigh Bullard . .	X.	*Dorchester* . . .	2 Gleason St., D.
Ames, Azel, 3d	I.	*Chelsea*	Chelsea.
Anderson, George Herbert .	X.	*Newburyport* . .	35 Rutland Sq.
Baker, Fred Charles . . .	II.	*Waltham* . . .	Waltham.
Bates, Harry Reyburn . .	V.	*Washington, D. C.*	69 Appleton St.
Batson, Walter Vennard .	VI.	*Allston*	9 Pomeroy St., A.
Beach, Charles Burr . . .	X.	*Dubuque, Iowa* .	71 Rutland St.
Beach, Irving Everett . .	V.	*Lawrence* . . .	134 Huntington Ave.
Beddall, Albert Richard . .	VII.	*Chelsea*	Chelsea.
Benedict, Vallette Lyman .	VI.	*Boston*	150 Huntington Ave.
Blake, Samuel Henry . .	VI.	*Brookline* . . .	283 Columbus Ave.
Bliss, Walter Danforth . .	IV.	*Carson City, Nev.* .	58 Chester Sq.
Boss, Charles Royce . . .	IX.	*New London, Conn.*	220 W. Chester Park.
Bovey, William Howard .	VI.	*Minneapolis, Minn.*	56 Chester Sq.
Brown, Willard Dalrymple, A. B.	IV.	*Lexington* . . .	Lexington.
Chace, Mason Smith . . .	II.	*Dorchester* . . .	31 Wales St., D.
Chapman, John Winslow, Jr.	II.	*Hyannis*	2 Columbus Sq.
Chapman, Nathan C. W. .	II.	*Hyannis*	2 Columbus Sq.
Chase, Harold Mayson . .	X.	*Lowell*	283 Columbus Ave.

NAME.	COURSE.	HOME.	RESIDENCE.
Claflin, Alan Avery . . .	V.	*Quincy*	Quincy.
Clarke, Edward Dutton . .	VI.	*Boston*	6 Louisburg Sq.
Clarke, Fred Hamilton . .	I.	*Jamestown, R. I.* .	132 Huntington Ave.
Clement, Arthur Austin . .	X.	*Chicago, Ill.* . .	89 Charles St.
Coolidge, Prescott Hilton .	I.	*So. Framingham* .	So. Framingham.
Copeland, Henry Fillmore .	I.	*Brooklyn, N. Y.* .	68 Chester Sq.
Crary, Horace Allen . . .	I.	*Sheffield, Pa.* . .	314 W. Chester Park.
Cutler, Charles Henry . .	VI.	*So. Framingham* .	So. Framingham.
Cutler, William Worcester .	VI.	*Waltham* . . .	220 W. Chester Park.
Dalton, Nelson Wait . . .	VI.	*Sandy Hill, N. Y.*	15 Joy St.
Davies, Theophilus Clive . .	II.	*Southport, England,*	66 Chester Sq.
Davis, Leon Keith . . .	X.	*West Newton* . .	West Newton.
Davis, William E., Jr. . .	IV.	*Englewood, Ill.* . .	58 Chester Sq.
Day, Nathan Brown, A. B. .	II.	*Boston*	280 Newbury St.
Dejonge, Alfred Louis . .	II.	*Stapleton, N. Y.* .	73 Cedar St., R.
Duckworth, Harry Stafford .	V.	*Lowell*	Lowell.
Dumaresq, Philip	I.	*Brookline* . . .	Brookline.
du Pont, Henry Belin . .	X.	*Wilmington, Del.* .	85 Appleton St.
Farnsworth, Arthur Jay . .	VI.	*Minneapolis, Minn.*	56 Chester Sq.
Ferguson, John Neil . . .	I.	*Readville* . . .	Readville.
Fowle, Frederick Eugene, Jr.	VIII.	*Arlington* . . .	Arlington.
Gallup, Harriet Tooker . .	V.	*Norwich, Conn.* .	235 W. Canton St.
Gardner, Harry Wentworth,	IV.	*Jamaica Plain* .	Weldon St., J. P.
Gilkey, Royal Waldo . . .	II.	*Watertown* . . .	Watertown.
Green, Francis Cushing . .	XI.	*Boston*	117 Marlborough St.
Greenleaf, Lewis Stone . .	VI.	*Lenox*	86 Mt. Vernon St.
Hall, Sarah Abbie . . .	VIII.	*Roxbury*	Hotel Adelphi, R.
Harrison, Burt Sylvanus . .	IV.	*La Crosse, Wis.* .	157 W. Canton St.
Harwood, Frederick Wm., Jr.	VI.	*Springfield* . . .	11 Milford St.
Hastings, Harry Payson .	I.	*So. Framingham* .	So. Framingham.
Haven, George Bartholomew,	II.	*Sangerfield, N. Y.*	162 W. Springfield St.
Hewitt, Herbert Edmund .	IV.	*Chicago, Ill.* . .	106 Appleton St.
Hicks, Edwin Francis . .	V.	*Peekskill, N. Y.* .	285 Columbus Ave.
Horton, Theodore . . .	XI.	*Coronado, Cal.* . .	100 Mt. Vernon St.
Howes, Clifton Armstrong .	VI.	*Cambridge* . . .	Cambridge.
Hunt. Albert Francis, Jr. .	I.	*Newburyport* . .	31 Dartmouth St.
Hunt, Edward Marshall . .	I.	*Portland Me.* . .	31 Dartmouth St.
Janvrin, Ned Herbert . .	I.	*Lexington* . . .	Lexington.
Johnson, Herbert Edward .	VI.	*Oberlin, Ohio* . .	140 Chandler St.
King, William Herbert . .	IX.	*Melrose*	Melrose.
Kinney, Charles Noyes, A. C.,	V.	*Des Moines, Iowa* .	676 Tremont St.
Kirk, Robert Horner . .	II.	*St. Paul, Minn.* .	19 Union Park.
Kittredge, John Woodman .	II.	*Alnwick, Colo.* . .	8 Brookline Ave.

NAME.	COURSE.	HOME.	RESIDENCE.
Knapp, Charles Reay . .	IV.	*Louisville, Ky.* .	220 W. Chester Pk.
Lacount, Henry Osgood . .	II.	*West Somerville* .	West Somerville.
Laighton, Florence Marian .	VII.	*Portsmouth, N. H.*	63 Worcester St.
Lane, Lucius Page . . .	IX.	*Boston*	623 Tremont St.
Leiper, George Neville . .	II.	*Philadelphia, Pa.* .	135 W. Newton St.
Leonard, Frederick Meehan	I.	*Jamaica Plain* .	165 Green St., J. P.
Locke, John Calvin . . .	III.	*Lockeford, Cal.* . .	298 Columbus Ave.
Lord, Frederic Wait . . .	VI.	*Boston*	8 Mt. Vernon St.
Loring, Robert	X.	*So. Boston* . . .	789 Broadway, S. B.
Lovejoy, Frank William . .	X.	*Concord, N. H.* .	Hotel Mitchell.
Lowell, Guy, A. B. . . .	IV.	*Cambridge* . . .	Cambridge.
MacClure, Colbert Anderson	IV.	*Delphi, Ind.* . .	22 Claremont Park.
Mackay, Angus Robert . .	III.	*Montreal, P. Q.* .	198 Beacon St.
Mahony, Marion Lucy . .	IV.	*Chicago, Ill.* . .	Cambridge.
Mann, Fred Maynard, B. C. E.	IV.	*Minneapolis, Minn.*	129 W. Newton St.
Maxwell, Frank Flagg . .	I.	*Fernandina, Fla.* .	22 Claremont Park.
Mayer, Virginius Augustus .	VI.	*Cincinnati, Ohio* .	28 Dartmouth St.
McCulloch, Alfred Hugh .	VI.	*Roxbury*	61 Beech Glen St., R.
McGoodwin, Henry Kerr, B. S.	IV.	*Bowling Green, Ky.*	16 Durham St.
McJennett, William Dargon,	X.	*Norwich, Conn.* .	88 W. Newton St.
McKibben, Frank Pape . .	I.	*Van Buren, Ark.* .	88 W. Newton St.
Meade, Charles Arthur . .	I.	*Millerton, N. Y.* .	60 W. Rutland Sq.
Moore, Leslie Rogers . .	V.	*Newton*	Newton.
Nash, Luther Roberts . .	VI.	*Ridgefield, Conn.* .	58 Chester Sq.
Newbegin, Parker C., A. B.,	I.	*Defiance, Ohio* . .	36 Yarmouth St.
Newhouse, Henry Leopold .	IV.	*Chicago, Ill.* . . .	7 Holyoke St.
Nichols, Walter Bancroft .	I.	*Reading*	Reading.
Noa, Frederic Martin . .	IX.	*Melrose Highlands*	2 Park Sq.
Nowell, John Chase . . .	VI.	*Reading*	Reading.
Owen, George, Jr	II.	*Lawrence* . . .	3 Oxford Terrace.
Parker, Winthrop Dana . .	IV.	*Reading*	Reading.
Patrick, Arthur Loomis . .	X.	*West Newton* . .	West Newton.
Phelan, Joseph Warren . .	V.	*East Boston* . . .	63 Lexington St., E.B.
Piper, Walter Elbridge . .	V.	*Hyde Park* . . .	Hyde Park.
Pollock, Clarence Dubois .	I.	*Washington, D. C.*	69 Appleton St.
Pratt, William Hemmenway.	VI.	*Waltham.* . . .	Waltham.
Prescott, Alice Beardslee .	VIII.	*Jamaica Plain* . .	123 Pond St., J. P.
Prescott, Samuel Cate . .	V.	*So. Hampton, N. H*	Cambridgeport.
Price, Raymond Beach . .	X.	*Boston*	35 W. Newton St.
Proctor, Richard Warren .	V.	*Billerica*	Billerica.
Quevedo, Narciso Tadeo, B. S.	II.	*Guatemala, C. A.* .	Worcester.
Reed, Samuel Gordon . .	II.	*Rockland*	3 Oxford Terrace.
Reed, Walter Wilson . . .	VI.	*Waltham.* . . .	Waltham.

NAME.	COURSE.	HOME.	RESIDENCE.
Reynolds, Howard Sidney .	VI.	*Randolph* . . .	Randolph.
Richards, Thomas Gleason .	II.	*Roxbury*	36 Lambert St., R.
Ripley, Henry Francis . .	II.	*Hingham Centre* .	Hingham Centre.
Robbins, Franklin Henry .	II.	*Kingston*	Cambridge.
Robeson, Anthony Maurice .	VI.	*Belvidere, N. J.* .	5 Concord Sq.
Rogers, Arthur Silas . . .	VI.	*Salem*	126 Berkeley St.
Savage, Silas Anthony . .	II.	*Chelsea*	Chelsea.
Sawyer, Albert Haydn . .	IX.	*Newburyport* . .	5 Oxford Terrace.
Sayward, William Henry, Jr.	VII.	*Dorchester* . . .	69 Monadnock St., D.
Schiertz, Ferdinand Alfred .	III.	*Auburndale* . . .	Auburndale.
Scott, Walter Osgood . . .	V.	*Providence, R. I.* .	325 Columbus Ave.
Sheppard, Robert Kimball .	X.	*Newton*	Newton.
Sherman, George Wilmarth .	X.	*Fall River* . . .	60 W. Rutland Sq.
Shurtleff, Arthur Asahel . .	II.	*Boston*	9 W. Cedar St.
Soley, William Alexander .	III.	*Chelsea*	Chelsea.
Southard, Francis Marshall .	VI.	*Brooklyn, N. Y.* .	89 Appleton St.
Sperry, Austin	II.	*San Francisco, Cal.*	56 Chester Sq.
Stevens, John Conyngham .	XI.	*Philadelphia, Pa.* .	6 Louisburg Sq.
Sturgis, Russell, 2d . . .	X.	*New York, N. Y.* .	19 St. James Ave.
Swanton, Henry Aiken . .	II.	*Gardiner, Me.* . .	W. Somerville.
Taber, George Aymar . .	I.	*Montrose*	Montrose.
Taylor, George	II.	*Brookline* . . .	Brookline.
Tenney, Albert Ball . . .	II.	*Everett*	Everett.
Thomson, Samuel Forsythe .	I.	*Charleston, S. C.* .	Salem.
Thorndike, Sturgis Hooper, A. B.	I.	*Cambridge* . . .	Cambridge.
Thropp, Joseph Earlston, Jr.	III.	*Philadelphia, Pa.* .	33 Yarmouth St.
Tidd, Arthur Warren . . .	I.	*No. Woburn* . .	No. Woburn.
Turner, Giles McClure . .	VI.	*Stoughton, Wis.* .	161 W. Brookline St.
Varney, Theodore	VI.	*Indianapolis, Ind.* .	126 Berkeley St.
Warren, Henry Ellis . . .	VI.	*Newton Centre* . .	Newton Centre.
Weil, Isaac, Ph. B. . . .	II.	*New York, N. Y.* .	17 Yarmouth St.
Westcott, William Read A. B.	VI.	*Cambridge* . . .	Cambridge.
Wheeler, Robert Charles .	I.	*Temple, N. H.* . .	11 Harwich St.
Wood, Kenneth Foster . .	II.	*Central Falls, R. I.*	Central Falls, R. I.
Wrightington, Charles Nelson	II.	*Brookline* . . .	Brookline.
Yoerg, Henry	II.	*St. Paul, Minn.* .	112 Pembroke St.

Second Year.

Abbot, Louis Andrew . . .	II.	*Boston*	108 Pembroke St.
Abbott, Gardner	I.	*New York, N. Y.* .	56 Chester Sq.
Adams, Benjamin	VI.	*Belmont*	Belmont.
Adams, Charles Mills . . .	VI.	*Roxbury*	59 Waverly St., R.

NAME.	COURSE.	HOME.	RESIDENCE.
Alden, Edwin Clement . .	VI.	*Cincinnati, Ohio* .	34 Savin St., R.
Appleton, Henry Morgan .	II.	*Springfield* . . .	58 Chester Sq.
Badger, Ernest Franklin . .	V.	*Everett*	Everett.
Ballou, Latimer Willis . .	II.	*Woonsocket, R. I.* .	60 W. Rutland Sq.
Barnard, Leonard Myrick .	IV.	*Gardiner, Me.* . .	69 Appleton St.
Barr, Lawrence, A. B. . .	VI.	*Boston*	275 Marlborough St.
Barrows, Harold Kilbreth .	I.	*Reading*	Reading.
Barry, Edmund Drinan . .	II.	*Dorchester* . . .	Bowdoin St., D.
Batchelder, William Jennings	II.	*Jamaica Plain* . .	Pond St., J. P.
Belknap, Francis Wheelwright	I.	*Baltimore, Md.* .	5 St. James Ave.
Berry, Charles William . .	VI.	*Somerville* . . .	Somerville.
Bixby, George Linder . .	X.	*Foxboro'*	Foxboro'.
Blodgett, Perley Hartwell .	V.	*Hyde Park* . . .	Hyde Park.
Boedeker, John	VI.	*Springfield* . . .	92 Worcester St.
Boeseke, Edgar Augustus .	II.	*Santa Barbara, Cal.*	171 Warren Ave.
Booth, Thomas Butler . .	VI.	*Danbury, Conn.* .	56 Chester Sq.
Bourne, Frank Augustus . .	IV.	*Bangor, Me.* . .	5 Oxford Terrace.
Bourne, Jesse Haskell . .	II.	*Foxboro'*	Foxboro'.
Brackett, Wallace Clarke .	XI.	*Chelsea*	Chelsea.
Brown, Allen Percy . . .	IX.	*Schuyler, Neb.* . .	273 Columbus Ave.
Burkhalter, De Nise . . .	II.	*Cedar Rapids, Iowa.*	12 St. James Ave.
Canfield, Arthur Lake . .	VI.	*Chicago, Ill.* . . .	218 W. Springfield St.
Carleton, Guy	II.	*Rockport, Me.* . .	94 Chandler St.
Chapman, William Louis .	VII.	*Newtonville* . . .	Newtonville.
Chase, Walter Simons . .	IV.	*Portland, Me.* . .	Lexington St., E. B.
Chenery, Winthrop Holt .	IV.	*Belmont*	Belmont.
Churchill, Percival Mitchell .	I.	*Elmwood*	Elmwood.
Claflin, William Bement . .	IV.	*Philadelphia, Pa.* .	19 St. James Ave.
Clapp, Eugene Howard . .	X.	*Roxbury*	3 Rockland St., R.
Clapp, Sidney Kingman . .	I.	*Dorchester* . . .	6 Clapp Pl., D.
Clark, Carl Herbert . . .	II.	*Dorchester* . . .	634 Dudley St., D.
Clark, Schuyler Stevens . .	I.	*Detroit, Mich.* . .	Clarendon Hills.
Clarke, Robert Campbell . .	VI.	*Atlanta, Ga.* . .	20 W. Cedar St.
Coburn, Arthur Stone . . .	III.	*Lowell*	20 St. James Ave.
Conant, Luther, Jr. . . .	IX.	*Acton*	Acton.
Cooke, Charles Prentice, .	VI.	*Farmington, N. H.*	8 Brookline Ave.
Cooke, John Williamson . .	VI.	*Waltham* . . .	Waltham.
Cooke, John Winfield . .	VI.	*Farmington, N. H.*	8 Brookline Ave.
Coolidge, Willie David . .	VI.	*Hudson*	112 Pembroke St.
Crafts, Walter Nathan, A. B.	III.	*Oberlin, Ohio.* . .	34 Claremont Park.
Crane, Henry Middlebrook .	II.	*New York, N. Y.* .	72 Pinckney St.
Cutter, Fred Bertram . . .	VI.	*Wakefield* . . .	Wakefield.
Cutter, George Albert . .	II.	*Hyde Park* . . .	Hyde Park.

NAME.	COURSE.	HOME.	RESIDENCE.
Cutter, Leonard Taylor	VII.	*Nashua, N. H.*	293 Columbus Ave.
Dean, Arthur Davis	VI.	*No. Cambridge*	No. Cambridge.
Defren, George	V.	*So. Boston*	449 Eighth St., S. B.
Denison, Edward Elias	X.	*Portland, Me.*	60 Rutland Sq.
Dickerman, Judson Charles	X.	*Boston*	113 Pembroke St.
Donham, Benjamin Curtis	I.	*Rockland*	Rockland.
Draper, Fred Wallace	III.	*Fayville*	Fayville.
Drisko, William Johnson	VI.	*Boston*	16 Carver St.
Ellis, Rolfe Marsh	V.	*Hyde Park*	Hyde Park.
Ellis, Walter Howe	I.	*Woonsocket, R. I.*	40 Union Park.
Eveleth, Charles Frederic	VI.	*So. Lincoln*	So. Lincoln.
Faxon, Francis Edwin	II.	*Conway, N. H.*	168 Falmouth St.
Fish, Milton Lathrop	VI.	*Pasadena, Cal.*	218 W. Springfield St.
Fisher, Bessie Florette	V.	*E. Boston*	142 Tremont St. E. B.
Fitten, James Turner	VI.	*Atlanta, Ga.*	20 West Cedar St.
Fitts, Harold Gerard	III.	*Philadelphia, Pa.*	21 St. James Ave.
Fuller, Andrew Daniel	I.	*Wakefield*	Wakefield.
Fuller, Frederic William	VI.	*Springfield*	60 W. Rutland Sq.
Gardiner, John Howland	II.	*Jamestown, R. I.*	21 Gray St.
Gardner, Henry	II.	*Salem*	Salem.
Goldsmith, Clarence	II.	*Andover*	Andover.
Goodyear, Watson Edward	VI.	*Naugatuck, Conn.*	63 Hancock St.
Grabau, Amadeus William	XII.	*Buffalo, N. Y.*	87 Appleton St.
Greene, George Gould	II.	*Constantinople, Turkey*	92 Pinckney St.
Gregory, John Herbert	I.	*Winchester*	Winchester.
Gutterson, Frank Alden	IV.	*Owatonna, Minn.*	750 Tremont St.
Hall, Walter Atwood	VI.	*Wallingford, Conn.*	269 Columbus Ave.
Hall, William Thomas	V.	*Boston*	42 Newbury St.
Hannah, Frederick Augustus	II.	*Chelsea*	Chelsea.
Harbaugh, Karl Springer	II.	*Seattle, Wash.*	56 Chester Sq.
Harkness, George Edward	I.	*Salem*	Salem.
Harris, Frederick Walter	XI.	*Fitchburg*	174 W. Springfield St.
Hawley, James Joseph	IV.	*Wilkes Barre, Pa.*	5 Oxford Terrace.
Hayden, George Wellington	VI.	*Roxbury*	493 Warren St., R.
Hayward, Harrison Washburn	X.	*Hyde Park*	Hyde Park.
Holdrege, Henry Atkinson	VI.	*Omaha, Neb.*	Milton.
Hormel, Herman	V.	*So. Boston*	41 M St., S. B.
Howard, Lemuel Frederic	VI.	*Ludlow*	98 Appleton St.
Howarth, George Reuben	II.	*Providence, R. I.*	352 Columbus Ave.
Howe, George Edward	I.	*Somerville*	Somerville.
Humphreys, James Barnes	II.	*New York, N. Y.*	20 W. Cedar St.
Hurd, Edward Laurence	II.	*Mattapan*	8 Butler St., D.
Huxley, Edward Haley	II.	*Newton*	Newton.

NAME.	COURSE.	HOME.	RESIDENCE.
Jackson, Henry Docker . .	VI.	*Boston*	Hotel Oxford.
Jacobson, Paul Franklin . .	I.	*St. Paul, Minn.* .	Cambridge.
Johnston, William Hooper .	III.	*Birmingham, Ala.*	202 Dartmouth St.
Jones, Allen Caldon . . .	II.	*Winthrop* . . .	390 Boylston St.
Keith, William Henry . .	VI.	*St. Augustine, Fla.*	131 W. Newton St.
King, George Glenn . . .	IV.	*Concord*	8 Rutland Sq.
Kleinschmidt, Fred . . .	VI.	*Cincinnati, Ohio* .	395 Warren St., R.
Kotzschmar, Hermann, Jr. .	II.	*Portland, Me.* . .	Wellesley Hills.
Leber, Edward	IV.	*York, Pa.* . . .	19 St. James Ave.
Le Bosquet, Maurice . . .	V.	*Haverhill* . . .	12 E. Dedham St.
Lewis, Marion Lincoln . .	IV.	*W. Roxbury* . .	March Ave., W. R.
Libby, Dorville, Jr. . . .	VI.	*San Francisco, Cal.*	117 Appleton St.
Lincoln, Alfred Varnum, Jr. .	II.	*Charlestown* . . .	32 Cordis St., C.
Logan, Andrew Jeffers Garvey	I.	*Gold Hill, Nev.* .	8 Brookline Ave.
Lonngren, John Erik . . .	II.	*Waltham* . . .	Waltham.
Loring, Ernest Johnson . .	IV.	*Somerville* . . .	Somerville.
Lothrop, Thomas Mark . .	II.	*Brookline* . . .	Brookline.
Marmon, Walter Carpenter .	II.	*Indianapolis, Ind.* .	113 Chandler St.
Masters, Frank Bird . . .	II.	*Mount Auburn* . .	Mount Auburn.
Matthes, François Emile . .	I.	*Amsterdam, Holland*	Hotel Bartol.
Matthes, Gerard Hendrik .	I.	*Amsterdam, Holland*	Hotel Bartol.
McKay, George Theodore, A.B.	VI.	*Boston*	142 Marlborough St.
McManus, James Thomas Reid	I.	*Memramcook, N. B.*	212 W. Springfield St.
Merriss, Geo. Frederic Carpenter	I.	*Pawtucket, R. I.* .	214 W. Newton St.
Meserve, Charles Arthur . .	V.	*Allston*	87 Linden St., A.
Miller, Franklin Thomas . .	VI.	*Auburndale* . . .	Auburndale.
Moore, John Denis Joseph .	II.	*Springfield* . . .	92 Worcester St.
Nagle, George Henry . .	VII.	*Boston*	13 Cortes St.
Nay, Ira Allen, Jr. . . .	II.	*Roxbury*	98 Moreland St., R.
Nelson, Henry Eugene . .	VI.	*Jamaica Plain* . .	283 Lamartine St., J.P.
Nesbit, Arthur Fleming, A.B.	VI.	*Milton, Pa.* . . .	273 Columbus Ave.
Newell, John Louis . . .	X.	*Roxbury*	241 Walnut Ave., R.
Park, Franklin Atwood . .	II.	*Taunton*	Taunton.
Parker, Charles Hamilton .	II.	*Brookline* . . .	Brookline.
Patten, William Fletcher .	VI.	*Dorchester* . . .	203 Savin Hill Ave. D.
Phemister, Walter Robert .	I.	*Chelsea*	Chelsea.
Powers, Walter Champion .	X.	*Springfield* . . .	40 St. Botolph St.
Rathbone, John Adams . .	VI.	*Detroit, Mich.* . .	314 Columbus Ave.
Raynolds, James Wallace .	III.	*Las Vegas, N. Mex.*	St. Botolph Hall.
Richards, Frederick Leonard	X.	*Somerville* . . .	Somerville.
Rickey, Walter Josiah . .	II.	*Athol*	201 W. Chester Park.
Roche, John Aloysious, A. B.	VI.	*Haverhill* . . .	24 Clarendon St.
Rockwell, George Arnold .	X.	*Roxbury*	Hotel Warren.

NAME.	COURSE.	HOME.	RESIDENCE.
Rourke, Louis Keegan	I.	*Abington*	Abington.
Rust, Harold Norwood	VI.	*Wilkes Barre, Pa.*	150 Huntington Ave.
Sadtler, Samuel Schmucker	V.	*Philadelphia, Pa.*	525 Columbus Ave.
Sanborn, Clifford Bartlett	IX.	*Norwood*	Norwood.
Schmitz, Frank Curtiss	I.	*Clinton, Iowa*	437 Columbus Ave.
Schoentgen, Edward Philipp.	IV.	*Council Bluffs, Iowa*	310 Columbus Ave.
Scofield, Donald Cleveland	IV.	*Cleveland, Ohio*	310 Columbus Ave.
Sears, Mortimer Andrews	III.	*Boston*	201 W. Chester Park.
Sheafe, Harry Jones	III.	*Seattle, Wash.*	238 Huntington Ave.
Sheridan, Richard G. B.	VI.	*Cleveland, Ohio*	220 W. Chester Park.
Shepard, George Frederic, Jr.	IV.	*Roxbury*	18 Waumbeck St., R.
Simmons, Alfred L.	I.	*S. Braintree*	S. Braintree.
Smith, Herbert Elmer	VI.	*Boston*	28 Claremont Park.
Smyser, James Swett	II.	*Brookline*	Brookline.
Stevens, Walter Frederick	II.	*Newton Highlands*	Newton Highlands.
Swift, Robert Wesselhoeft	II.	*New York, N. Y.*	20 W. Cedar St.
Swope, Gerard	VI.	*St. Louis, Mo.*	360 Columbus Ave.
Taft, Charles Chester	X.	*Jamaica Plain*	50 Eliot St., J. P.
Tappan, Sanford	VI.	*Manchester*	23 Greenwich Park.
Thomas, James Winthrop	II.	*Wayland*	21 St. James Ave.
Tillinghast, Charles Foster	II.	*Providence, R. I.*	60 Rutland Sq.
Torrey, George Winthrop	IX.	*Rockland*	Rockland.
Tucker, Edward Austin	I.	*Melrose*	Melrose.
Tucker, Hugh Mercer	II.	*Colorado Springs, Col.*	70 W. Rutland Sq.
Turner, Horace Kibbe	IV.	*Quincy, Ill.*	Newton.
Waite, Loren Gleason	VI.	*Malden*	Malden.
Walworth, Joseph Edward	V.	*Lawrence*	97 Appleton St.
Wason, Robert Sidney	V.	*Nashua, N. H.*	293 Columbus Ave.
Watkins, Willard Haskell	V.	*East Boston*	223 Saratoga St., E. B.
Wells, James Russell	IV.	*Quincy, Ill.*	49 Rutland Sq.
Weston, David Brainard	V.	*Sharon*	Sharon.
Wheeler, Ralph Norman	I.	*Concord*	8 Rutland Sq.
Wiggin, Thomas Hollis	I.	*Malden*	Malden.
Williams, Charles Goodnow	I.	*Norwalk, Ohio*	20 Rutland Sq.
Williams, Roger James	IX.	*Canton*	Canton.
Williams, Walter Scott	X.	*Dedham*	Dedham.
Winkley, William Henry	II.	*W. Medford*	W. Medford.
Wolfe, John J. Colvin	II.	*Coeymans, N. Y.*	20 Rutland Sq.
Wood, Florence Anna	VIII.	*Roxbury*	9 Bainbridge St., R.
Woods, Frederick Adams	VII.	*Brookline*	Brookline.
Yoder, Luther Keller	II.	*Reading, Pa.*	527 Columbus Ave.
Zapf, Alfred Edward	IV.	*Freeport, Ill.*	106 Appleton St.

First Year.

NAME.	HOME.	RESIDENCE.
Adams, Zabdiel Boylston, Jr.	*Framingham*	Framingham.
Allen, William Henry, Jr.	*Boston*	293 Com'wealth Ave.
Ames, William, Jr.	*Providence, R. I.*	Providence, R. I.
Anderson, William Pope, Jr.	*Cincinnati, Ohio*	Brookline.
Andrew, Frederick William	*Boston*	1925 Washington St.
Andrew, William McCorkle	*Linwood, Ohio*	58 Chandler St.
Bailey, Thomas Ward	*Kingston*	154 W. Brookline St.
Bakenhus, Reuben Edwin	*Chicago, Ill.*	153 Worcester St.
Baldwin, Edward Arthur	*Dorchester*	308 Columbia St., D.
Baldwin, Henry Sill	*Middletown, Conn.*	5 Concord Sq.
Barbour, William Ernest	*Chicago, Ill.*	89 Charles St.
Barker, Edgar Harrison	*Lawrence*	21 St. Charles St.
Barto, Henry Desbrow	*Syracuse, N. Y.*	40 W. Newton St.
Batchelder, Charles Eldermann	*So. Boston*	930 Fourth St., S. B.
Bates, Daniel Moore, Jr.	*Wilmington, Del.*	St. Botolph Hall.
Beede, M. Josie	*Stow*	5 Oxford Terrace.
Beers, Herbert Page	*Chicago, Ill.*	134 St. Botolph St.
Bell, Stewart Sargent	*Andover*	Andover.
Bicknell, Percy Lincoln	*Weymouth*	Weymouth.
Bigelow, Maurice Wells	*Clinton*	198 Beacon St.
Black, Maurice	*Toledo, Ohio*	5 Winthrop St., R.
Blair, Lewis Van Deventer	*Cincinnati, Ohio*	103 Pinckney St.
Bliss, George Henry	*Newburyport*	122 W. Newton St.
Blodgett, Kinsley	*Pawtucket, R. I.*	Cambridgeport.
Bowers, Allston Rice	*Needham*	Needham.
Bowes, George Sidney	*Moosup, Conn.*	28 Worcester St.
Brackett, Edwin Raymond	*Newton*	Newton.
Brackett, Thomas Thayer	*Minneapolis, Minn.*	56 Chester Sq.
Bragg, Edward Milton	*Cambridgeport*	Cambridgeport.
Breed, Lewis Bazzoni	*Lynn*	Lynn.
Brooks, John Flavel	*No. Hanover*	731 Tremont St.
Brown, Edwin Allen	*New York, N. Y.*	19 St. James Ave.
Brown, Harry Webster	*Winchester*	Winchester.
Brown, Paul Richardson	*Dayton, Ohio*	372 Boylston St.
Brown, Theodore Lyman	*Westboro.*	Westboro.
Browne, Harry Patrick	*Houston, Texas*	375 Columbus Ave.
Burgess, George Kimball	*Newtonville*	Newtonville.
Burnside, Thomas Anderson	*Portland, Oreg.*	295 Columbus Ave.
Cabot, Sewall	*Brookline*	Brookline.

NAME.	HOME.	RESIDENCE.
Cadenas, Manuel Henry	*Brooklyn, N. Y.*	126 Berkeley St.
Cadieu, Edward Leland	*Chelsea*	Chelsea.
Callan, John Gurney	*Lynn*	Lynn.
Cameron, Allan, Jr.	*Westford*	Westford.
Campbell, Justin Willis	*W. Roxbury*	Corey St., W. R.
Cary, Louis Alexander	*Medway*	Brookline.
Chamberlin, Helen	*Wellesley Hills*	Wellesley Hills.
Chittenden, Albert	*New York, N. Y.*	38 St. Botolph St.
Clary, Joseph Ward	*Mattapan*	Mattapan.
Cleaves, Ezra Eames	*Rockport*	109 Chandler St.
Clifford, William Henry, Jr.	*Portland, Me.*	21 Blagden St.
Clough, William Bentley	*W. Springfield*	42 Dundee St.
Cobb, Herbert Luther	*Mansfield*	Mansfield.
Coburn, Frederick William	*Lowell*	1 Yarmouth St.
Coley, John Lonson	*Westport, Conn.*	61 Chandler St.
Colman, Willard Henry	*La Crosse, Wis.*	48 Chandler St.
Compton, George Kennedy	*Dayton, Ohio*	127 Pembroke St.
Conant, Francis Melvin	*Watertown*	Watertown.
Coolidge, Winthrop	*Chicago, Ill.*	Brookline.
Coristine, Walter Hawes	*Montreal, P. Q.*	708 Tremont St.
Corson, William Bertrand	*Watertown*	Watertown.
Cotton, Leonard Miller	*Dedham*	Dedham.
Cramer, Edwin	*Milwaukee, Wis.*	129 Pembroke St.
Crane, Stephen Dow	*Boston*	102 Mt. Vernon St.
Crane, Thompson Baxter	*Quincy*	Quincy.
Crocker, Carl Ira	*Portland, Me.*	Newton.
Crocker, Percy Kemper	*Chicago, Ill.*	330 W. Chester Park.
Crosby, Fred Marshall	*Melrose*	Melrose.
Crosby, Ralph Worthington	*Osterville*	115 W. Newton St.
Cummings, Henry, Jr.	*Boston*	3 Union Park.
Curry, Walter Elmer	*Melrose Highlands*	Melrose Highlands.
Cushing, Joseph, Jr.	*Fitchburg*	571 Columbus Ave.
Dakin, George Waters	*Roxbury*	20 Atwood Ave., R.
Damon, Frederick Whitman	*Arlington*	Arlington.
Daniels, Nathan Hagar, Jr.	*Boston*	13 Joy St.
Davis, Franklin Hayes	*Wayne, Pa.*	195 Warren Ave.
Davis, Robert Allen	*Yarmouthport*	Somerville.
de Bullet, Eugene Gustav	*Baltimore, Md.*	Hotel Brunswick.
Deming, Walter Edgar Spencer	*Roxbury*	23 Fulda St., R.
Dickson, Marshall Mar	*Houston, Tex.*	360 Columbus Ave.
Downes, Alfred Kimball	*Gloucester*	73 Montgomery St.
Drake, Chester Francis	*No. Cambridge*	No. Cambridge.
Driscoll, Joseph	*Brookline*	Brookline.

NAME.	HOME.	RESIDENCE.
Driscoll, James Michael	*Brookline*	Brookline.
Drum, Alphonsus Ligouri	*Ft. Wingate, N. Mex.*	28 Chester Sq.
Dupee, James Alexander	*Dorchester*	12 Monadnock St., D.
Eames, Edward Ashley	*Buffalo, N. Y.*	115 St. Botolph St.
Elliot, Richard Oliver	*Thomaston, Me.*	2 Yarmouth St.
Emerson, Lonville Eugene	*Portland, Me.*	479 W. Newton St.
Emery, Dan George	*Boston*	Copley Sq. Hotel.
Estes, Francis Thomas	*Newtonville*	Newtonville.
Ewell, Leonard Gordon	*Marshfield Hills*	1 Dexter Row, C.
Ewing, William Clinton	*Danvers*	159 Warren Ave.
Farley, George Louis	*Lynn*	Lynn.
Field, Frederick Elbert	*Greenfield*	Malden.
Field, William Ellis	*Weymouth*	Weymouth.
Fisk, Harry George	*Springfield*	140 Huntington Ave.
Flood, Robert Douglas	*Chicago, Ill.*	33 St. James Ave.
Forster, Frederick Everard	*New York, N. Y.*	58 Eliot St., J. P.
Foss, Charles Ether	*Lowell*	1 Yarmouth St.
Franklin, Joseph, Jr.	*Kirkwood, Mo.*	58 Chester Sq.
Freedman, Louis Alexander	*Boston*	20 Berwick Park.
Fresch, George, Jr.	*St. Louis, Mo.*	385 Columbus Ave.
Fuller, Myron Leslie	*Brockton*	Brockton.
Gage, Stephen De Meritte	*Bradford*	69 Dartmouth St.
Gibbs, Lucian Everett	*Cambridge*	Cambridge.
Gibson, Charles Hammond Jr.	*Boston*	137 Beacon St.
Gillespie, Amos Ewing	*Colora, Md.*	7 Rockland Pl., R.
Goodhue, Leonard H.	*Salem*	Salem.
Goodspeed, George Marston	*Hyde Park*	Hyde Park.
Gordon, Edward Bertelle, Jr.	*Lynn*	Lynn.
Gould, Edward Percival	*Augusta, Me.*	114 W. Chester Park.
Grush, Henry Granville	*Dorchester*	Draper Court, D.
Guptill, Frank Edward	*Winter Harbor, Me.*	Atlantic.
Guttridge, James Addison	*Roslindale*	Garden St., Ros.
Hale, Benjamin, Jr.	*Newburyport*	Newburyport.
Hallaran, John Sanford	*Toledo, O.*	20 Rutland Sq.
Hamlet, Harry Gabriel	*Dorchester*	Stockton St., D.
Hapgood, Charles Warren	*Everett*	Everett.
Hardy, Robert Samuel	*Bangor, Me.*	18 St. James Ave.
Harrington, Joseph	*Reading*	Reading.
Hartwell, Hiram Britton	*Watertown*	Watertown.
Haseltine, William Carl	*Portland, Oreg.*	295 Columbus Ave.
Haseltine, William Ebenezer	*Dartford, Wis.*	863 Boylston St.
Haste, James Henry	*Lawrence*	Lawrence.
Hatch, George Parsons	*West Newton*	West Newton.

NAME.	HOME.	RESIDENCE.
Hawley, Harvey F.	*Baldwinsville, N. Y.*	4 Oxford Terrace.
Hedge, Henry Rogers	*Plymouth*	15 St. James Ave.
Hedge, William Russell	*Plymouth*	15 St. James Ave.
Henderson, James Buist	*Ludlow*	98 Appleton St.
Henry, Ralph Coolidge	*Watertown*	Watertown.
Hersey, Francis Coney, Jr.	*Wellesley Hills*	Wellesley Hills.
Hewins, George Sanford	*Dedham*	Dedham.
Hodges, Arthur Webster	*Newton Highlands*	Newton Highlands.
Hoisington, Edwin Tilson	*W. Roxbury*	Garfield Ave., W. R.
Holbrook, Clark	*New York, N. Y.*	W. Newton.
Hollander, Charles Edwin	*Millis*	Millis.
Hollis, Walter Munroe	*Lynn*	Lynn.
Holt, William Abernethy, Jr.	*New London, Conn.*	163 W. Chester Park.
Houghton, John Howard	*East Boston*	112 White St., E. B.
Howard, Frank Allen	*Brockton*	Brockton.
Howard, Perry Brooks	*Gardner*	Auburndale.
Howe, Charles Gaff	*Aurora, Ind.*	St. Botolph Hall.
Howe, Joseph Milton	*Houston, Tex.*	240 Huntington Ave.
Howland, Richard Stanley	*Providence R. I.*	38 St. Botolph St.
Huey, William Queen	*Easthampton*	16 James St.
Hultman, Eugene Christian	*Quincy*	Quincy.
Hunt, Carlton Ritter	*Weymouth Heights,*	Weymouth Heights.
Hunt, Harry Draper	*No. Attleboro*	681 Tremont St.
Hurd, Benjamin, Jr.	*Brookline*	Brookline.
Hyde, Charles Gilman	*Yantic, Conn.*	69 Montgomery St.
Ingell, Homer Preston	*Taunton*	Taunton.
Jackson, Allen Winchester	*St. Paul, Minn.*	3 Union Park.
Jacobs, Elbridge Churchill	*Portsmouth, N. H.*	32 Claremont Park.
James, Walter Herman	*Portsmouth N. H.*	1845 Washington St.
Jameson, Minor Story	*Clinton Cor's, N. Y.*	94 Huntington Ave.
Johnson, Paul Franklin	*Milwaukee, Wis.*	708 Tremont St.
Kent, William Albert	*Washington, D. C.*	156 W. Chester Park.
Killam, James Warren	*Reading*	Reading.
Kimball, Elwell Fairfield	*Newburyport*	Newburyport.
Knight, Joseph Hyde	*Pittsfield*	750 Tremont St.
Knights, Arthur Alphronus	*Melrose*	Melrose.
Langley, Martha Esther	*W. Newton*	W. Newton.
Laws, Eugene Hiram	*Bedford*	Bedford.
Leach, William Henry, Jr.	*Brooklyn, N. Y.*	Cambridgeport.
Leary, William Gardner	*So. Boston*	167 Dorchester St.
Leighton, Marshall Ora	*Portland, Me.*	Somerville.
Leland, Walter Swift	*Saxonville*	Saxonville.
Lewis, James Edward	*W. Somerville*	W. Somerville.

NAME.	HOME.	RESIDENCE.
Lewis, Richard Henry	*W. Roxbury*	Park St., W. R.
Litchfield, Paul Weeks	*Dorchester*	94 Howard Ave., D.
Locke, Charles E.	*Portsmouth, N. H.*	Chelsea.
Lockwood, Rhodes Greene	*Boston*	118 Beacon St.
Lootz, Alf C.	*Boston*	116 St. Botolph St.
Low, Cecil Horace	*Gloucester*	73 Montgomery St.
Lunt, Robert Somerby	*Newburyport*	Newburyport.
Lyman, George William	*Salem*	Salem.
Lynch, Charles Patrick	*Lowell*	Lowell.
Lythgoe, Hermann Charles	*Winthrop*	Winthrop.
Mackay, George Baptist	*Montreal, Que.*	198 Beacon St.
Maclachlan, Andrew Dugald	*Melrose*	Melrose.
Mahoney, Joseph Michael	*Dorchester*	21 Bailey St., D.
Manahan, John Henry	*Boston*	14 Newbury St.
Mansur, Leon Wallace	*Houlton, Me.*	124 Pembroke St.
Marble, Louis Cortright	*Swampscott*	Swampscott.
Mason, William Chipman	*Weymouth*	Weymouth.
Maynadier, Causten Browne	*Taunton*	Taunton.
Mayo, Walter John	*Foxcroft, Me.*	295 Columbus Ave.
McAlpine, William Horatio	*Lawrence*	97 Appleton St.
McCann, Frank Goodman	*Oak Park, Ill.*	180 Columbus Ave.
McCarter, Frederic William	*Holbrook*	Holbrook.
McGann, Malcolm Hobart	*Boston*	130 Huntington Ave.
McGlynn, Thomas	*Fall River*	19 Concord Sq.
McKay, James Albert	*Pittsburgh, Pa.*	124 Pembroke St.
Mead, Ernest Eugene	*So. Boston*	495 Fourth St., S. B.
Merrell, Irving Seward	*Syracuse, N. Y.*	165 St. Stephen St.
Moat, Charles Perkins	*Portsmouth, N. H.*	58 Chester Sq.
Moore, Milton Ernest	*Arlington*	Arlington.
Morrice, Arthur Anderson	*Montreal, Que.*	240 Huntington Ave.
Morrill, Charles Herbert	*No. Andover Depot*	No. Andover Depot.
Morrill, Guy Louis	*Roxbury*	35 Howard Ave., R.
Morris, Charles	*Fort Canby, Wash.*	174 St. Stephen St.
Morrison, William Whitney	*Ellsworth, Me.*	75 Waltham St.
Morse, Louis Shepard	*Great Falls, N. H.*	62 Berkeley St.
Nagle, James William	*Concord Junction*	Concord Junction.
Nevin, Charles Kirkland Barker	*Allston*	71 Gardner St., A.
Newell, Herbert Damon	*Hampden*	152 Warren Ave.
Newhall, Charles Saunderson	*Lynn*	19 St. James Ave.
Norris, Grace Adelaide	*Chelsea*	Chelsea.
Norris, Reginald	*Brussels, Belgium*	66 Chester Sq.
Northup, Edwin Saunders	*Pensacola, Fla.*	557 Columbus Ave.
Osmont, Vance Craigmiles	*San Francisco, Cal.*	557 Columbus Ave.

NAME.	HOME.	RESIDENCE.
Paine, Charles Bodwell	*Augusta, Me.*	18 Holyoke St.
Palmer, Joseph Porter	*Boston*	21 Pinckney St.
Parsons, Chester Henry	*Marlborough*	Marlborough.
Partridge, Welles Mortimer	*Woodstock, Conn.*	Hyde Park.
Paul, Charles Howard	*Linden*	Linden.
Pauly, Karl Almon	*W. Somerville*	W. Somerville.
Peabody, Francis Richardson	*Gilead, Me.*	35 Rutland Sq.
Peckham, Harold Abner	*Newport, R. I.*	23 St. James Ave.
Peirce, Vernon Marshall	*Boston*	169 W. Newton St.
Pennell, Walter Otis	*Exeter, N. H.*	78 Charles St.
Perkins, Thomas Tounge	*Lynn*	Lynn.
Pierce, Myron Everett	*Watertown*	Watertown.
Pillsbury, Joel Horace	*Bridgewater*	Bridgewater.
Poppenhusen, Herman Adolph	*So. Evanston, Ill.*	708 Tremont St.
Pratt, Frederick Henry	*Boston*	102 W. Newton St.
Priest, Mortimer Chouteau	*St. Louis, Mo.*	122 Huntington Ave.
Prince, Ellis Waldo	*Thomaston, Me.*	2 Yarmouth St.
Putnam, John Luther	*Houlton, Me.*	65 St. Botolph St.
Rice, Harry Jonathan	*St. Louis, Mo.*	379 Columbus Ave.
Richardson, Daniel Artemas	*Boston*	161 W. Chester Park.
Robinson, Amos George	*Vienna, Va.*	Cambridge.
Robinson, Elmer Holbrook	*Reading*	Reading.
Rockwell, John Arnold, Jr.	*Norwich, Conn.*	69 Montgomery St.
Rogers, Frank Henry	*Newburyport*	122 W. Newton St.
Rogerson, John Russell	*Mansfield*	Mansfield.
Root, William Lacy	*Pittsfield*	23 Pinckney St.
Rosengarten, Francis Albert	*Louisville, Ky.*	6 Bowdoin St.
Ruckgaber, Albert Felix	*Brooklyn, N. Y.*	73 Cedar St., R.
Rundlet, Frederick Taylor	*Cambridgeport*	Cambridgeport.
Russell, Andrew Le Baron	*Mt. Vernon, Ala.*	15 St. James Ave.
Russell, James Clayton	*Chicago, Ill.*	128 Huntington Ave.
Sager, Lawrence Kingsley	*Somerville*	Somerville.
Saldaña, Eduardo Egberto	*Boston*	3 Oxford Terrace.
Sanders, William Huntington	*Salem*	Salem.
Sax, Moritz	*Cincinnati, Ohio*	38 Holyoke St.
Scovel, John Combs, Jr.	*Edgewater, Ill.*	375 Columbus Ave.
Sears, Henry Kent	*Danvers*	Danvers.
Shepard, Benjamin Halsted	*E. Orange, N. J.*	58 Chester Sq.
Sherman, Henry Arthur	*Boston*	1 Chester Sq.
Sjöström, Waldemar Luther	*Lawrence*	Lawrence.
Smalley, Frank Newell	*Westborough*	Westborough.
Smith, Charles Doyle	*Brookline*	Brookline.
Smith, Fred Haskell	*Wakefield*	Wakefield.

NAME.	HOME.	RESIDENCE.
Smith, Herbert Edwards	*Gloucester*	109 Chandler St.
Smith, Nathan H.	*New London, Conn.*	330 W. Chester Park.
Smith, Paul Dohan	*W. Chester, Pa.*	39 Union Park.
Smith, William Graves	*Mansfield*	Mansfield.
Smyser, Albert Ernest	*Brookline*	Brookline.
Smyser, Frederic William	*Brookline*	Brookline.
Smyth, Joseph Hilton	*Plymouth*	32 Myrtle St.
Snell, Elmer Alvin	*Holbrook*	Holbrook.
Snyder, John Lovett	*St. Louis, Mo.*	684 Tremont St.
Souther, Allan Bartlett	*Somerville*	Somerville.
Stamp, Charles Edmund	*Cleveland, Ohio*	228 W. Canton St.
Starbuck, George Franklin	*Waltham*	Waltham.
Starr, Russell Tillinghast	*Brooklyn, N. Y.*	126 Berkeley St.
Stearns, Walter Mulliken	*Waltham*	Waltham.
Stevens, Erving Emory	*Roxbury*	30 Waumbeck St., R.
Stevens, Harold Converse	*Braintree*	Braintree.
Stickney, Joseph White	*Great Falls, N. H.*	62 Berkeley St.
Stone, Charles Henry Howard	*Newton*	Newton.
Stroud, Lamont Russell	*St. Albans, Vt.*	190 W. Brookline St.
Sturm, Meyer Joseph	*Chicago, Ill.*	7 Holyoke St.
Sturtevant, Edward Lewis, Jr.	*So. Framingham*	So. Framingham.
Sturtevant, Joseph Lewis	*Quincy*	Quincy.
Sumner, George William	*Omaha, Neb.*	122 Chandler St.
Swanton, John Camp	*Bath, Me.*	W. Somerville.
Sweet, Elwood Perkins	*Concord*	Concord.
Talbot, James	*Holliston*	Holliston.
Tappan, Lewis Hooper	*Boston*	23 Greenwich Park.
Tarr, Edward Gibbs	*N. Bridgton, Me.*	100 Waltham St.
Thanisch, Frank Arthur	*Jamaica Plain*	3305 Washington St.
Thomas, William Harrison, Jr.	*Lowell*	Lowell.
Thompson, Albert William	*Lowell*	Lowell.
Tilley, John	*W. Troy N. Y.*	161 W. Chester Park.
Tower, Clement Bates	*Hyde Park*	Hyde Park.
Tozier, Henry Harris	*Haverhill*	Haverhill.
Trumbull, Charles Dunbar	*Kansas City, Mo.*	78 Rutland St.
Tucker, Charles William	*Andover*	Andover.
Tuttle, Morton Chase	*Milford, N. H.*	Brookline.
Tyler, Lucius Spaulding	*Waltham*	Waltham.
Urquiza y Bea, Pedro	*Bilbao, Spain*	St. Botolph Hall.
Underhill, Arthur Perley	*Springfield*	140 Huntington Ave.
Vose, Willard Badger	*Hyde Park*	Hyde Park.
Wadleigh, Melvin	*Salem*	Salem.
Waldo, Herbert Carleton	*Ward Hill*	Ward Hill.

NAME.	HOME.	RESIDENCE.
Walker, Frederick Henry. . . .	*Taunton*	Taunton.
Waterman, Henry Arthur . . .	*Malden*	Malden.
Wayne, Jacob Lloyd, 3d	*Cincinnati, Ohio* .	Lynn.
Wells, Albert Jameson	*Salem Depot, N. H.*	53 A Dale St., R.
Wentworth, Charles Austin . . .	*Haverhill* . . .	Haverhill.
Werner, John Thomas	*Pottsville, Pa.*	110 Chandler St.
Whiting, Ralph Spelman . . .	*Pittsfield*	Brookline.
Whitney, Lambert Nutt	*Newton*	Newton.
Whitney, Richard	*Dorchester* . . .	40 Wales St., D.
Whitten, William Henry Jr. . . .	*Jamaica Plain* . .	59 School Pl., J. P.
Williams, Benjamin Charles . . .	*Fort Smith, Ark.* .	88 W. Newton St.
Wise, Samuel Francis	*So. Boston* . . .	771 Broadway, S. B.
Wood, Willett Aubrey	*Detroit, Mich.* . .	518 Columbus Ave.
Woodsum, Arthur Francis . . .	*Portsmouth, N. H.*	100 Waltham St.
Woodwell, Julian Ernest	*Newburyport* . .	Newburyport.
Woodyatt, Ernest	*Evanston, Ill.* . .	41 Union Park.
Wyard, Edward Saxon	*Washington, D. C.*	30 St. James Ave.

SPECIAL STUDENTS.

The abbreviations used in this list, which includes all students who are not in the full regular courses, are: —

App. Mech.	Applied Mechanics.	Hist.	History.
Arch.	Architecture.	Lang.	Modern Languages.
Biol.	Biology.	Math.	Mathematics.
Chem.	Chemistry.	Mech. Eng.	Mechanical Engineering.
Civ. Eng.	Civil Engineering.	Min. Eng.	Mining Engineering.
Draw.	Drawing and Descriptive Geometry.	Phys.	Physics.
Elect. Eng.	Electrical Engineering.	Pol. Sci.	Political Science.
Eng.	English.	San. Eng.	Sanitary Engineering.
Geol.	Geology.	Shop.	Shopwork.

NAME.	HOME.	RESIDENCE.
Abbott, Frederick Bancroft App. Mech., Mech. Eng., Phys., Shop.	*Providence, R. I.*	144 W. Newton St.
Abell, Adelaide Mae Phys., Pol. Sci.	*Allston*	19 Farrington Ave., A.
Allen, Annie Elizabeth, A. B. Chem.	*Cambridgeport*	Cambridgeport.
Allen, Mark Webb Chem., Draw., Eng., Lang., Math.	*Detroit, Mich.*	15 Blagden St.
Allen, Ralph Whittier Shop.	*Boston*	Hyde Pk. Ave., Ros.
Allen, William F. Draw.	*Denver, Colo.*	No. Cambridge.
Ames, John Worthington, A. B. Arch., Draw.	*Cambridge*	Cambridge.
Andrews, Edmund Lathrop Math., Mech. Eng., Phys.	*Chicago, Ill.*	220 W. Chester Park.
Armstrong, Herbert App. Mech., Draw., Math., Mech. Eng., Phys., Shop.	*Detroit, Mich.*	137 W. Newton St.
Ashton, George Francis Eng., Draw., Hist., Lang., Math., Phys.	*Salem*	Salem.
Ashton, John Arch., Draw., Math.	*Lawrence*	Lawrence.
Badgley, Charles Grayum Arch., Draw., Lang., Math.	*Gallipolis, Ohio*	14 Holyoke St.
Bailey, Roland Chem., Lang., Math., Mech. Eng., Phys., Shop.	*Kingston*	154 W. Brookline St.
Balch, Francis du Pont Arch., Draw., Lang.	*Baltimore, Md.*	46 Clarendon St.

NAME.	HOME.	RESIDENCE.
Baldwin, Harry Alexander . . . Biol., Lang., Phys., Pol. Sci.	*Hawaiian Islands* .	58 Chester Sq.
Banta, May, B. S. . . . . Phys.	*Brooklyn, N. Y.* .	Wellesley.
Bardwell, Frank Newton, Jr. . . Chem., Draw., Eng., Hist., Math., Phys., Shop.	*Cambridge* . . .	Cambridge.
Barker, George Gardner . . . . Draw., Eng., Lang., Math., Phys., Shop.	*Woburn*	Woburn.
Barnes, Charles Jenckes . . . . Chem., Lang.	*Chicago, Ill.* . . .	138 Huntington Ave.
Barrett, Caroline Whitney . . . Eng. Hist.	*Boston*	19 W. Cedar St.
Barstow, George Edward . . . . App. Mech., Draw., Lang., Mech. Eng., Phys., Shop.	*Lynn*	Lynn.
Bartholomew, Ethel, B. L. . . . App. Mech., Arch., Draw., Geol., Lang.	*Chariton, Iowa* . .	298 Columbus Ave.
Bartlett, Bertha Leavitt . . . . Biol.	*Somerville* . . .	Somerville.
Barton, Howard Rittenhouse . . Elect. Eng., Math., Phys.	*Englewood, N. J.* .	192 Dartmouth St.
Batcheller, Henry Renssaelaer . . Biol., Chem., Geol., Lang., Min. Eng.	*Charlestown* . . .	34 Monument Sq., C.
Baumann, Edward Steinhauer . . Arch., Draw.	*Chicago, Ill.* . . .	101 Pinckney St.
Beaman, David Webster . . . . Chem., Draw., Eng., Lang., Math.	*Cincinnati, Ohio* .	Waltham.
Bean, Norwin Sherwood . . . . App. Mech., Draw., Elect. Eng., Lang., Math., Mech. Eng., Phys., Pol. Sci., Shop.	*Manchester, N. H.*	45 Union Park.
Bean, Sidney Alfred . . . . . Civ. Eng., Eng., Hist., Lang., Math., Min. Eng., Phys.	*Milwaukee, Wis.* .	19 St. James Ave.
Belden, Richard Edwin . . . . App. Mech., Draw., Eng., Mech. Eng., Phys., Shop.	*New London, Conn.*	20 Union Park.
Berry, Hereford . . . . . Elect. Eng., Math., Phys.	*No. Andover* . .	368 Columbus Ave.
Bigelow, Charles Willard . . . Chem., Draw., Eng., Hist., Lang., Math., Shop.	*Clinton*	7 W. Cedar St.
Bigelow, Frederick Southgate . . App. Mech., Draw., Elect. Eng., Lang., Math., Phys., Pol. Sci.	*Boston*	334 Shawmut Ave.
Blakeslee, George Lee . . . . Chem., Draw., Eng., Lang., Math.	*Waterbury, Conn.*	134 St. Botolph St.
Bliss, Dunne Leroi, Jr. . . . . Draw., Eng., Hist., Math., Mech. Eng., Phys., Shop.	*Carson City, Nev.* .	58 Chester Sq.
Boutwell, Arthur Toull, A. B., . . Chem.	*Andover*	Andover.
Bradley, Arthur Willson, Jr. . . Arch., Draw., Lang.	*Newport, Ky.* . .	16 Durham St.
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NAME.	HOME.	RESIDENCE.
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Brown, Walter Vail	*Oldtown, Me.* . .	9 Berwick Park.
App. Mech., Elect. Eng., Math., Mech. Eng., Phys.		
Brownell, Charles Tilley	*Newport, R. I.* . .	21 Gray St.
Arch., Draw., Eng., Geol., Lang., Math.		
Bucher, Russell Samuel	*Harrisonburg, Va.*	408 Columbus Ave.
Arch., Chem., Draw., Eng., Hist., Math., Phys.		
Buckminster, Harold Chase . . .	*Malden*	Malden.
Chem., Hist., Lang., Math., Phys.		
Bullard, Mary Bean	*Portland, Me.* . .	36 Hollis St.
Arch., Draw., Geol., Lang.		
Bumstead, Barton Dale	*Colorado Springs, Col.*	70 W. Rutland Sq.
Arch., Draw., Hist.		
Burckhardt, Horatio Wolcott . .	*Cincinnati, Ohio* .	89 Charles St.
App. Mech., Draw., Lang., Math., Mech. Eng., Phys.		
Buttimer, John Henry	*Hingham* . . .	Hingham.
Arch., Draw., Geol., Lang., Phys.		
Cadwell, William Harry	*Nashua, N. H.* . .	89 Appleton St.
App. Mech., Mech. Eng., Civ. Eng.		
Cannon, Lewis Teile	*Salt Lake City, Utah*	No. Cambridge.
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Carter, Philip Greenleaf	*Portland, Me.*	38 Rutland Sq.
Eng., Lang., Math., Shop.		
Cary, Hunsdon	*Richmond, Va.* . .	134 St. Botolph St.
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Case, Winthrop Tracy	*Canton Center, Conn.*	156 Warren Ave.
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Chaffee, Dudley Chase	*Shelbyville, Ill.*,	120 Pembroke St.
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Chapin, Mabel Huidekoper . . .	*Brookline* . . .	Brookline.
Pol. Sci.		
Cheney, Nathan	*Boston*	136 Chandler St.
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Clapp, Gustavus	*Framingham* . .	Framingham.
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Chem.		
Clergue, Bertrand Joseph . . .	*Bangor, Me.* . .	16 St. James Ave.
Chem., Draw., Eng., Hist., Lang., Math., Phys., Shop.		
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Draw., Lang., Math., Mech. Eng., Phys.		
Colburn, George Clement . . .	*Boston*	Hotel Tudor.
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Chem., Draw., Eng., Lang., Math.		
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Cook, Frank Remick	*Detroit, Mich.* . .	10 Westland Ave.
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Copeland, William Rogers, A. B. .	*Cambridge* . . .	Cambridge.
Biol., Chem.		
Cotton, Harry Willett	*Boston*	193 Beacon St.
Chem., Lang., Math., Shop.		
Cousins, Sterling Green	*Fortuna, Cal.* . .	156 Warren Ave.
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Culver, Clarence Crouch	*Rochester, N. Y.* .	5 Falmouth St.
Draw., Eng., Math., Shop.		
Curtis, Thomas Pelham	*Boston*	21 St. James Ave.
App. Mech., Elect. Eng., Mech. Eng., Math., Phys.		
Cushing, Joseph Whitney, Jr. . .	*Boston*	29 Worcester St.
Draw., Eng., Hist., Lang., Math., Phys., Shop.		
Dana, Leslie	*Kirkwood, Mo.* . .	58 Chester Sq.
Draw., Math., Mech. Eng., Phys., Shop.		
Dann, Mary Eliza	*Warsaw, N. Y.* .	12 Gray St.
Chem., Draw., Math., Phys.		
Davenport, Fred Albert	*Malden*	Malden.
Draw., Eng., Math., Phys.		
Davis, Herbert Eugene	*Newark, N. J.* . .	58 Chester Sq.
Arch., Draw., Lang., Math., Phys.		
Davis, Stanton Kirkham	*Oakland, Cal.* . .	St. Botolph Hall.
Civ. Eng., Geol., Lang., Phys.		
Day, Philip Baldwin	*Newtonville* . . .	Newtonville.
App. Mech., Lang., Mech. Eng., Phys., Shop.		
DeLong, Harold Williams . . .	*Medford*	Medford.
Draw., Eng., Hist., Lang., Math., Phys., Shop.		
De Normandie, Sarah Yardley . .	*Kingston*	120 Marlborough St.
Biol., Chem., Geol.		
Denson, Hugh Cowan, B. C. E. .	*Gadsden, Ala.* . .	140 Chandler St.
Civ. Eng., Draw., Mech. Eng., Phys., Shop.		
Dexter, Edward McBeth	*Milwaukee, Wis.* .	15 St. James Ave.
Elect. Eng., Eng., Lang., Phys., Pol. Sci.		
Dickey, Charles William	*Hawaiian Islands* .	58 Chester Sq.
App. Mech., Arch., Draw., Lang., Math., Phys.		

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Disston, Henry	*Philadelphia, Pa.* .	32 West Cedar St.
Chem., Draw., Eng., Shop.		
Doliber, Franklin Whitney . . .	*Brookline* . . .	38 St. Botolph St.
Draw., Eng., Hist., Lang., Math., Mech. Eng., Phys., Shop.		
Dorrance, John Thompson . . .	*Bristol, Pa.* . . .	527 Columbus Ave.
Chem. Eng., Hist., Lang., Math., Phys.		
Dove, John	*Andover.*	
Chem., Draw., Eng., Lang., Shop.		
Drake, Albert Wesley	*No. Cambridge* . .	No. Cambridge.
Draw., Lang., Math., Mech. Eng., Phys., Pol. Sci.		
Draper, George Thomas	*Canton*	Canton.
Chem., Draw., Eng., Lang., Math., Phys.		
Dufort, Cajetan Joseph	*Montreal, Que.* . .	Hotel Glendon.
Arch., Draw., Geol., Hist.		
Dunbar, Albert	*Pittsfield*	85 Appleton St.
Chem., Draw., Math., Phys.		
Dyar, Harrison Gray, S. B. . . .	*Roxbury*	49 Winthrop St., R
Biol.		
Dyer, Harry Wing	*Portland, Me.* . .	247 W. Newton St.
Draw., Eng., Lang., Math.		
Dyer, John, Jr.	*Chicago, Ill.* . . .	15 Upton St.
Arch., Draw., Eng., Hist., Phys.		
Eastman, Albert Goodhue . . .	*Cambridgeport* . .	Cambridgeport.
Arch., Draw., Math.		
Eaton, Everett Lawrence . . .	*Needham*	Needham.
App. Mech., Lang., Math., Mech. Eng., Phys., Shop.		
Ellis, John	*Woonsocket, R. I.* .	40 Union Park.
App. Mech., Elect. Eng., Lang., Math., Mech. Eng., Phys.		
Emery, Sidney Sheppard	*Newton Centre* . .	Newton Centre.
Chem., Lang.		
Evans, William Eugene	*Jamaica Plain* . .	South St., J. P.
Arch., Draw.		
Fabyan, Francis Wright	*Boston*	36 Beacon St.
Biol., Hist., Lang., Pol. Sci.		
Fernald, Robert Heywood, B. M. E.	*Orono, Me.* . . .	9 Temple St.
Arch., Draw.		
Field, Frederick Cromwell . . .	*Brooklyn, N. Y.* .	30 St. James Ave.
Draw., Eng., Hist., Math., Phys., Shop.		
Fisher, Laura	*Boston*	108 Marlborough St.
Biol.		
Fitts, Frederic Whitney	*Somerville* . . .	Somerville.
Arch., Draw., Geol., Lang.		
Flather, Ernest James	*Nashua, N. H.* . .	100 Pembroke St.
Draw., Eng., Hist., Mech. Eng., Phys., Shop.		
Fletcher, Grace Webster	*Milton*	Milton.
Biol., Chem.		
Flint, Richard Hall	*San Juan, Cal.* .	13 Arlington St.
Chem., Math., Phys., Shop.		

NAME.	HOME.	RESIDENCE.
Foster, Harold Abbott	*N. Brookfield* . .	124 Pembroke St.
Eng., Hist., Math., Phys., Shop.		
Foster, Mary Louise, A. B. . . .	*Jamaica Plain* .	709 Centre St., J. P.
Chem.		
Frank, Mortimer	*Chicago, Ill.* . .	7 Holyoke St.
Chem., Draw., Eng., Lang., Math.		
Frazier, Floyd	*Aurora, Ill.* . .	129 Charles St.
Chem., Eng., Lang., Math.		
Fuller, Robert Lesure	*Worcester* . . .	60 W. Rutland Sq.
Arch., Draw., Eng., Hist., Lang., Math., Phys.		
Gaines, Bessie Venable	*Mossingford, Va.* .	112 Charles St.
Biol., Chem., Geol., Lang., Phys., Pol. Sci.		
Gardner, John Howland	*New London, Conn.*	20 Union Park.
App. Mech., Mech. Eng., Shop.		
Garlichs, Charles Frederick . . .	*Brooklyn, N. Y.* .	42 Holyoke St.
Arch., Draw., Lang.		
Gatch, Elwood Stewart	*Omaha, Neb.* . .	Braintree.
Biol.		
Gates, Frank C.	*Denver, Colo.* . .	56 Gray St.
Arch., Draw., Geol., Pol. Sci.		
Geiger, Albert, Jr.	*Boston*	29 Com'wealth Ave.
Arch., Draw., Eng., Hist., Lang., Math., Phys.		
Gilman, Harry Sargent	*Manchester* . . .	58 Chester Sq.
Biol., Chem., Draw., Eng., Lang.		
Gore, Henry Watson, Jr.	*Roxbury*	331 Warren St., R.
Arch., Draw.		
Greene, Francis	*Cedar Rapids, Iowa.*	128 St. Botolph St.
Biol., Eng., Hist., Lang., Pol. Sci.		
Greenfield, William Hirst . . .	*Baltimore, Md.* . .	128 Huntington Ave.
Chem., Eng., Hist., Pol. Sci.		
Hallowell, Lucretia Mott . . .	*W. Medford* . .	W. Medford.
Biol., Chem.		
Harlowe, Frank Lorin	*Washington C. H., Ohio*	1323 Wash'ton St.
Arch., Draw., Lang., Math., Phys.		
Harnden, Charles Albert	*Boston*	26 E. Springfield St.
Civ. Eng., Draw., Math., Phys.		
Hart, Donald Purple, Ph. B. . .	*Marietta, Ohio* . .	118 Charles St.
Arch., Draw.		
Hatfield, Albert Deming	*Upland, Pa.* . .	172 W. Brookline St.
Chem., Draw., Math.		
Haven, Harry Merritt	*Somerville* . . .	Somerville.
Draw., Eng., Hist., Lang., Math., Mech. Eng., Phys.		
Hazelton, Isaac Brewster . . .	*Wellesley Hills* . .	Wellesley Hills.
App. Mech., Civ. Eng., Geol., Lang., Math., Phys., Pol. Sci.		
Heywood, Charles Davis	*Holyoke.*	
App. Mech., Lang., Phys.		
Hickey, William James	*Boston*	50 W. Cedar St.
App. Mech., Arch., Draw., Geol., Lang., Math., Phys., Pol. Sci.		

NAME.	HOME.	RESIDENCE.
Hill, William Gilbert, Jr.	*Malden.*	Malden.
App. Mech., Draw., Lang., Math., Mech. Eng., Phys.		
Holden, Ben Edwin	*Aurora Ill.*	86 Mt. Vernon St.
Arch., Draw., Geol., Lang., Phys.		
Holden, Frank Howell	*Aurora, Ill.*	86 Mt. Vernon St.
Arch., Draw., Lang., Pol. Sci.		
Holwill, John Anderson	*Brookline*	Brookline.
Biol., Eng., Hist., Lang., Math., Pol. Sci.		
Hooper, Laurita Thornton	*Brooklyn, N. Y.*	76 Marlborough St.
Math.		
Hopewell, Charles Frederick	*Cambridgeport*	Cambridgeport.
App. Mech., Draw., Elect. Eng., Math., Mech. Eng., Phys.		
Hopkins, James Cleveland	*Jamaica Plain*	Park Pl., J. P.
Arch., Draw., Eng., Lang., Math., Phys.		
Howland, Cyrus Chapman	*New Bedford*	21 Concord Sq.
Chem., Draw., Eng., Math.		
Howland, Frank Seaman	*Athens, N. Y.*	60 W. Rutland Sq.
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Hubbard, Charles Bela	*Lyndon, Vt.*	162 W. Springfield St.
Draw., Math., Mech. Eng., Shop.		
Hulse, William Stewart	*Fort Wayne, Ind.*	134 Huntington Ave.
Draw., Elect. Eng., Eng., Lang., Mech. Eng., Phys., Pol. Sci., Shop.		
Hurd, Charles Henry	*Joliet, Ill.*	140 Chandler St.
Chem., Draw., Eng., Math., Phys.		
Ingalls, Charles Henry	*Danvers*	Danvers.
Chem., Draw., Eng., Lang., Math., Shop.		
Jackson, William Dunham	*Bridgewater*	Bridgewater.
Phys.		
Jaques, Frank Waterman	*Newbury*	Newbury.
Draw.		
Janvrin, Walter Adams	*Revere*	Revere.
Civ. Eng., Geol., Math., Pol. Sci.		
Jenckes, Earle Stanton	*Woonsocket, R. I.*	135 W. Newton St.
Lang., Math., Mech. Eng., Phys., Shop.		
Jenson, Joseph	*St. Charles, Idaho*	Cambridgeport.
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Johnson, Charles Herbert	*Jamaica Plain*	494 Centre St., J. P.
App. Mech., Civ. Eng., Lang., Phys., Pol. Sci.		
Johnson, Cyrus Fisher	*Memphis, Tenn.*	308 Newbury St.
Arch., Draw., Geol., Lang., Math.		
Johnson, William Arthur	*Jamestown, R. I.*	67 Chandler St.
Chem., Geol., Lang., Math., Phys., Pol. Sci.		
Johnston, Robert	*Harrisburg, Pa.*	86 Chandler St.
Chem., Draw., Eng., Lang, Math.		
Jones, Howard Kingsley	*Erie, Pa.*	153 Worcester St.
Chem., Draw., Eng., Lang., Math.		
Jones, John William	*Needham*	Needham.
App. Mech., Draw., Lang., Math., Mech. Eng., Phys.		

NAME.	HOME.	RESIDENCE.
Jones, Milton Frank	*Natick*	Natick.
Chem., Lang.		
Kendricken, Frank Alexander . .	*Roxbury*	75 Maple St., R.
Draw., Shop,		
Kimball, Joseph Harris	*Newburyport* . .	7 Burlington Ave.
App. Mech., Biol., Chem., Civ. Eng., Geol., Lang., Math., Phys., Pol. Sci.		
Klipstein, Ernest Carl	*St. Louis, Mo.* . .	58 Chester Sq.
Arch., Draw., Hist., Lang.		
Kramer, Emma Viola	*Boston*	Blagden St.
Arch., Draw., Eng., Lang.		
Lambirth, William Henry . . .	*Boston*	20 Follen St.
Draw., Shop.		
Lane, George H. Thomas . . .	*Norwood, Ohio* . .	32 W. Cedar St.
App. Mech., Mech. Eng., Phys.		
Lawrence, Ralph Restieaux . . .	*Dorchester* . . .	34 Sumner St., D.
Draw., Eng., Hist., Lang., Math., Mech. Eng., Phys., Shop.		
Lawson, George	*Cincinnati, Ohio* .	Brookline.
Chem., Lang., Math., Min. Eng., Phys.		
Locke, Hattie Frances	*Nashua, N. H.* . .	298 Columbus Ave.
Arch , Draw., Lang., Math.		
Lockwood, Charles Eastman . .	*Boston*	220 W. Chester Park.
Arch., Draw., Eng., Hist., Lang., Math., Phys.		
Lynch, Albert Johnson	*Jamaica Plain* . .	47 Holbrook St., J.P.
Eng., Draw., Lang., Math., Mech. Eng., Phys.		
Lysaght, Bella Bernadette . . .	*Brooklyn, N. Y.* .	Somerville.
Chem., Draw., Lang., Math.		
Mansfield, Edward Stacey . . .	*Wakefield* . . .	Wakefield.
Chem., Draw., Math.		
Marble, Dwight Newcomb, A. B. .	*Owensboro, Ky.* .	138 Charles St.
Draw., Eng., Lang., Mech. Eng., Phys., Shop.		
Marshall, Albert Tisdale, S. B. . .	*Brockton*	Brockton.
App. Mech., Mech. Eng.		
Mason, Elizabeth Spaulding, A. B.,	*Boston*	164 W. Chester Park.
Chem.		
Mattocks, William Skinner . . .	*Lyndon, Vt.*	
Chem., Draw., Math., Shop.		
Maverick, Samuel Augustus . . .	*San Antonio, Tex.*	306 Columbus Ave.
Draw., Lang., Math., Mech. Eng., Phys.		
McClintock, Edwin Clare . . .	*Wollaston Heights* .	Cambridge.
Chem., Math.		
McElwain, Helen Whyte . . .	*Boston*	177 W. Brookline St.
Hist.		
McGonigle, Edward Andrew . .	*Leavenworth, Kan.*	13 Union Park.
Arch., Draw., Lang., Math.		
Melluish, James George	*Bloomington, Ill.* .	372 Boylston St.
Draw., Eng., Lang., Math., Mech. Eng., Phys., Shop.		
Merrill, George Earnest	*St. Paul, Minn.* .	56 Chester Sq.
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Merryweather, George Edmund Chem., Draw., Eng., Lang., Math.	*Cincinnati, Ohio*	Waltham.
Metcalf, Mary Church Biol.	*Cambridge*	Cambridge.
Mink, Edward Lang., Math., Mech. Eng., Phys., Shop.	*W. Somerville*	W. Somerville.
Moore, Rittenhouse Randolph Lang., Phys., Shop.	*Mobile, Ala.*	202 Dartmouth St.
Moormann, Edwin Arch., Draw., Math.	*Cincinnati, Ohio*	28 Dartmouth St.
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Morse, Charles Francis App. Mech., Civ. Eng.	*Milford, N. H.*	41 Union Park.
Mott-Smith, Harold Meade Arch., Draw., Geol., Math.	*Boston*	101 Newbury St.
Moulton, Raymond Edward App. Mech., Math., Mech. Eng., Phys.	*Paris, France*	8 St. James Ave.
Murphy, John Francis Chem., Civ. Eng., Eng., Math., Lang., Phys.	*Turner's Falls*	354 Columbus Ave.
Newman, Arthur Brantley Lang., Mech. Eng., Phys.	*Shreveport, La.*	157 W. Concord St.
Nichols, George Abram Arch., Draw., Eng., Hist., Lang., Math.	*Fitchburg*	571 Columbus Ave.
Nisbet, John Lord Chem., Lang., Phys., Pol. Sci.	*Savannah, Ga.*	27 St. James Ave.
Norris, Walter Henry App. Mech., Civ. Eng.	*Melrose*	Melrose.
Owen, Allison Arch., Draw., Geol., Lang.	*New Orleans, La.*	43 Hancock St.
Owen, James Martin Chem., Eng., Lang., Math.	*Norwich, N. Y.*	87 Appleton St.
Paessler, Vinton Sherman App. Mech., Math., Mech. Eng., Phys., Shop.	*Roxbury*	80 Bower St., R.
Parker, Horatio Newton Biol., Chem., Geol., Lang.	*Cambridge*	Cambridge.
Parmelee, Charles Lester App. Mech., Biol., Civ. Eng., Lang., Math., Phys., Pol. Sci.	*Toledo, Ohio.*	122 Chandler St.
Parnall, William E., Jr., S. B. App. Mech., Draw., Elect. Eng., Mech. Eng., Phys.	*Calumet, Mich.*	221 W. Canton St.
Pechin, John Shelley Draw., Lang., Math., Mech. Eng., Phys., Shop.	*Cleveland, Ohio*	220 W. Chester Park.
Perez, Faustino Apolonio App. Mech., Civ. Eng., Min. Eng., Phys.	*Parras-Coahuila, Mex.*	111 Pembroke St.
Perrin, Ethel Biol.	*West Newton*	West Newton.
Phillips, Charles Abbott, B. S. Arch., Draw.	*Evanston, Ill.*	387 Boylston St.

NAME.	HOME.	RESIDENCE.
Plummer, Laura S.	*East Boston* . . .	157 Princeton St.
Biol.		
Randall, Edward Bryant	*Medford*	Medford.
Draw., Eng., Math., Phys.		
Raymond, Edward Lincoln, A. B. .	*Boston*	53 Gray St.
Civ. Eng., Min. Eng.		
Reed, George Whitefield Fay . .	*Lynn*	Lynn.
Chem., Draw., Eng., Hist., Mech. Eng., Phys.		
Rees, Carl Samuel	*Newark, Ohio* . .	22 Yarmouth St.
Chem., Draw., Eng., Lang., Math.		
Reynolds, Robert Duncan . . .	*Jamaica Plain* . .	45 Orchard St., J. P.
App. Mech., Mech. Eng., Phys., Shop.		
Rhodes, William Stevens	*Jamaica Plain* .	2 Knights Court, J. P.
Biol., Chem., Civ. Eng., Eng., Hist., Lang., Math.		
Rice, William Jackson	*Leominster* . . .	232 W. Canton St.
Biol., Eng., Hist., Lang., Math., Phys., Pol. Sci.		
Richards, Daniel Webster, Jr. . .	*Needham*	Needham.
Draw., Lang., Math., Mech. Eng., Phys., Shop.		
Richardson, William Symmes . .	*E. Oakland, Cal.* .	17 Union Park.
App. Mech., Arch., Draw., Hist., Lang., Math., Phys.		
Robbins, Fred Linwood	*East Acton* . . .	East Acton.
Chem., Draw., Math., Shop.		
Roberts, Edwin Hughes	*Denver, Colo.* . .	238 Huntington Ave.
Draw., Eng., Hist., Lang., Math., Mech. Eng., Phys., Shop.		
Roberts, Harold Barnes, S. B. . .	*Boston*	81 Mt. Vernon St.
Elect. Eng., Phys.		
Robins, William Powell	*Morristown, N. J.*	6 Louisburg Sq.
Arch., Draw., Eng., Hist., Math.		
Rogers, John Arthur	*Chicago, Ill.* . . .	387 Boylston St.
Arch., Draw., Geol.		
Rosenheim, Samuel Faisst . . .	*St. Louis, Mo.* . .	27 St. James Ave.
Arch., Draw., Hist.		
Rutherford, Norman Franklin . .	*Bathurst, N. S. W.*	48 Tennyson St.
Draw., Eng., Hist., Lang., Math., Mech. Eng., Phys., Shop.		
Sanford, Earl Leroy	*Mansfield Valley, Pa.*	23 Worcester Sq.
Draw., Shop.		
Sawin, Luther Robinson	*Waltham* . . .	Waltham.
Chem., Draw., Lang., Math.		
Schaller, Frederick Francis . . .	*So. Natick* . . .	So. Natick.
Draw., Eng., Hist., Lang., Math., Phys., Shop.		
Shaw, Alfred Victor	*Newton Highlands* .	Newton Highlands.
Arch., Chem., Draw., Eng., Lang., Math.		
Sheppard, Clara Emma	*Newton*	Newton.
Biol.		
Shurrocks, Alfred Francis . . .	*Providence, R. I.* .	Providence, R. I.
Arch., Draw., Math.		
Sias, Frank Solon Vail	*Cambridge* . . .	Cambridge.
Biol., Chem., Civ. Eng., Draw., Eng., Hist., Lang., Math., Phys.		

NAME.	HOME.	RESIDENCE.
Sloan, Alfred Pritchard, Jr.	*Brooklyn, N. Y.*	308 Columbus Ave.
Draw., Eng., Hist., Lang., Math., Phys., Shop.		
Smith, Edward Francis	*Turner's Falls*	354 Columbus Ave.
Chem., Draw., Eng., Hist., Math., Mech. Eng., Phys., Shop.		
Smith, William Douglas	*Exeter, Ont.*	7 Rutland Sq.
Chem., Draw., Eng., Hist., Math., Mech. Eng., Phys.		
Smyser, Charles James	*Brookline*	Brookline.
Chem.		
Spence, David Jerome	*Georgetown, Ky.*	295 Columbus Ave.
Chem., Draw , Eng., Lang., Math.		
Stamp, Charles Marcus	*Mt. Vernon, Ohio*	89 Charles St.
Draw., Math.		
Stearns, Fred Lincoln	*Hopkinton*	So. Framingham.
Civ. Eng., Geol., Math., Phys.		
Stebbins, Elwyn Wilfred	*Boston*	58 Chester Sq.
App. Mech., Civ. Eng., Geol., Lang., Math., Phys.		
Stowell, Alvah Wood	*Leominster*	232 W. Canton St.
Eng., Hist., Lang., Pol. Sci.		
Strader, Jacob, Jr.	*Ashtabula, Ohio*	77 High St.
Chem., Draw., Eng., Lang., Math.		
Stratton, George Eber	*Shelburne Falls*	Brookline.
Chem., Draw., Eng., Lang., Math.		
Sturgis, Edward, A. B.	*Manchester*	8 Chestnut St.
Draw.		
Sweet, Everell Shipley	*Malden*	Malden.
Draw.		
Swift, William Everett	*W. Hartford, Conn.*	62 Pinckney St.
Civ. Eng., Draw., Eng., Hist., Lang., Math., Phys.		
Taylor, Alfred Tucker	*Montclair, N. J.*	43 Hancock St.
Arch., Draw , Geol., Lang.		
Taylor, William Bellamy	*Brookline*	Brookline.
App. Mech., Draw., Math., Mech. Eng., Phys., Shop.		
Thayer, William Wilberforce, Jr.	*River Falls, Wis.*	144 W. Newton St.
Chem., Draw., Eng., Lang., Math.		
Thomas, William Bacon	*Stockton, Cal.*	453 Columbus Ave.
Arch., Draw., Pol. Sci.		
Thornley, Frank Atkinson	*Chelsea*	Chelsea.
Eng., Hist., Lang.		
Thurber, John Houghton	*Providence, R. I.*	371 Columbus Ave.
Chem., Geol., Lang., Min. Eng.		
Towle, Edward Avery	*Westfield*	1 Yarmouth St.
Chem., Civ. Eng., Eng., Hist., Lang., Min. Eng., Phys.		
Towne, Frederick Tallmadge	*Stamford, Conn.*	6 Louisburg Sq.
App. Mech., Draw., Math., Mech. Eng., Phys., Shop.		
Towne, Lillian M.	*Brighton*	88 Parsons St., B.
Biol.		
Trout, Charles Eliphalet	*Chicago, Ill.*	676 Tremont St.
Chem., Draw., Eng., Lang., Math.		

NAME.	HOME.	RESIDENCE.
True, Ross	*Augusta, Me.* . .	74 Harvard Ave., A.
Draw., Eng., Lang.		
Tucker, Frank Stevenson	*Marblehead* . . .	Marblehead.
Draw., Math , Shop.		
Tufts, Leonard	*Medfora*	Medford.
App. Mech , Eng., Lang., Math., Phys., Pol. Sci., Shop.		
Turner, Alfred Copeland	*Cambridge* . . .	Cambridge.
Arch., Draw., Geol., Lang.		
Vandenbergh, Arthur Prior . . .	*New York, N. Y.* .	115 Chandler St.
Chem., Eng., Hist., Lang., Math., Phys., Shop.		
Van Tuyl, Thomas Walter . . .	*Petrolia, Ont.* . .	100 Huntington Ave.
App. Mech., Draw., Elect. Eng., Lang., Math., Mech. Eng., Phys., Pol. Sci.		
Vorce, Walter Herbert	*Farmington, Conn.*	220 W. Chester Park.
App. Mech., Draw., Math., Mech. Eng., Phys.		
Waite, Edward Broughton . . .	*W. Newton* . . .	W. Newton.
App. Mech., Math., Mech. Eng., Phys., Shop.		
Walker, Amasa	*N. Brookfield* . .	58 Chester Sq.
Eng., Hist., Lang., Pol. Sci.		
Wardner, Herbert Leavitt . . .	*Dorchester* . . .	Bowdoin Ave., D.
Arch., Eng., Lang., Math., Phys.		
Warren, Mabel Louise	*Roxbury*	16 Copley St., R.
Arch., Draw., Lang.		
Wason, Rigby	*Girvan, Scotland* .	8 St. James Ave.
Elect. Eng., Math., Mech. Eng., Phys.		
Watson, Elizabeth Seaver . . .	*Weymouth* . . .	Weymouth.
Geol.		
Watson, Herbert Jeremiah . . .	*Boston*	242 Huntington Ave.
Chem., Draw., Eng., Hist., Lang., Math., Shop.		
Watson, Thomas Augustus . . .	*Weymouth* . . .	Weymouth.
Geol.		
Weidinger, Albert Ernest . . .	*Brooklyn, N. Y.* .	118 Chandler St.
Arch., Draw., Eng., Math., Phys.		
Welling, George Bertram . . .	*No. Bennington, Vt.*	94 Pembroke St.
Chem., Draw., Lang., Phys., Shop.		
Wheeler, Archer Estes	*Lewiston, Me.* . .	Weymouth.
Chem., Draw., Lang., Math., Min. Eng.		
Wheildon, William Maxwell . . .	*Boston*	425 Beacon St.
Draw., Math., Mech. Eng., Phys., Shop.		
Whiston, William Cortelyou . .	*Newtonville* . . .	Newtonville.
App. Mech., Elect. Eng., Math., Mech. Eng., Phys.		
Whiton, Chauncey Gilbert . . .	*Hingham Centre* .	Hingham Centre.
App. Mech., Draw., Math., Phys., Shop.		
Williams, Roland H.	*Remsen, N. Y.* . .	71 Carver St.
Chem., Draw., Eng., Lang., Math.		
Wilson, Harry Colby	*Nahant*	Nahant.
App. Mech., Math., Mech. Eng., Phys., Shop.		
Wilson, Winslow Abbott	*Dorchester* . . .	72 Magnolia St., D.
Draw., Eng., Lang., Mech Eng , Phys.		

NAME.	HOME.	RESIDENCE.
Wingate, Edward Lawrence . . .	*Malden*	Malden.
App. Mech., Civ. Eng., Draw., Math., Phys.		
Woollett, William Lee	*Loudonville, N. Y.*	162 W. Springfield St.
Arch., Draw., Eng., Lang., Math., Phys.		
Wray, Charles Fredenburg . . .	*Rochester, N. Y.* .	437 Columbus Ave.
Chem., Draw., Eng., Hist., Lang., Math., Phys.		
Wray, John Edward	*St. Louis, Mo.* . .	408 Columbus Ave.
Geol., Hist., Lang., Pol. Sci.		
Wright, James Hayden, A. B. . .	*Detroit, Mich.* . .	39 Union Park.
Arch., Draw., Geol., Math.		
Young, Conrad Henry	*Canton, Ohio* . .	134 St. Botolph St.
Chem., Draw., Eng., Lang., Math.		
Zimmermann, Albert Gottlob . .	*Peru, Ill.*	243 W. Canton St.
Arch., Draw., Geol., Lang.		
Zitz, Frederick Charles	*New York, N. Y.* .	14 Holyoke St.
Arch., Draw.		

SUMMARY.

GRADUATE STUDENTS	48	REGULAR STUDENTS, 2d year .	175
REGULAR STUDENTS, 4th year .	138	REGULAR STUDENTS, 1st year .	314
REGULAR STUDENTS, 3d year .	144	SPECIAL STUDENTS	286

Total	1,105
Deduct names counted twice	45
	1,060

LOWELL FREE COURSES OF INSTRUCTION.

The Trustee of the Lowell Institute has established, under the supervision of the Institute of Technology, courses of instruction, generally given in the evening, and open to students of either sex free of charge.

These courses are more or less varied from year to year by the omission or interchange of particular subjects, but include in their entire scope, instruction in mathematics, mechanics, physics, drawing, chemistry, geology, natural history, biology, English, French, German, history, navigation, and nautical astronomy, architecture, and engineering.

The subjects and the extent of the several courses will be made known by suitable advertisement in the public journals, in October of each year.

As it is the object of these courses to provide substantial teaching rather than merely popular illustration of the subjects treated, it is expected that all persons attending will come with a serious purpose of improvement, and that they will cheerfully comply with such rules as may be prescribed in regard to attendance and to order in the class or lecture-room.

The conditions of attendance on these gratuitous courses are as ollows : —

1. Candidates must have attained the age of eighteen years.

2. Their applications must be made in writing, addressed to the Secretary of the Institute, specifying the course or courses they desire to attend, mentioning their present or prospective occupations, and, when the course is of a nature demanding preparation, stating the extent of their preliminary training.

The number of students in each class is necessarily limited.

The courses for 1892–93 are on the following subjects : —

I. ELECTRICAL MEASUREMENTS. Ten laboratory exercises conducted by Associate Professor Holman, on Fridays, at 7 P. M., beginning November 4.

II. THEORY AND SOLUTION OF HIGHER EQUATIONS. Twelve lectures by Associate Professor Wells, on Mondays and Wednesdays, at 7.45 P. M., beginning November 7.

III. ITALIAN LITERATURE IN THE THIRTEENTH CENTURY. Twelve lectures by Associate Professor Carpenter, on Mondays and Wednesdays, at 7.30 P. M., beginning November 7.

IV. ELEMENTS OF ORGANIC CHEMISTRY. Twelve lectures by Associate Professor Norton, on Mondays and Wednesdays at 7.30 P. M., beginning November 7.

V. STRENGTH OF ENGINEERING MATERIALS. Discussion of Testing Apparatus. Methods of Testing and Results. Twelve lectures by Assistant Professor Sondericker, on Tuesdays and Thursdays, at 7.30 P. M., beginning November 8.

VI. AMERICAN HISTORY. Twelve lectures by Professor Levermore on Tuesdays and Fridays, at 8 P. M., beginning November 8.

VII. FRENCH CIVILIZATION. (Lectures in French.) Twelve lectures by Professor van Daell, on Fridays, at 8 P. M., beginning November 11.

VIII. STEREOTOMY. Twelve lectures on Stereotomy by Assistant Professor Homer, on Mondays and Thursdays, at 7.30 P. M., beginning December 5.

IX. METALLURGY OF ARGENTIFEROUS LEAD. Twelve lectures by Associate Professor Hofman, on Tuesdays and Thursdays, at 8 P. M., beginning December 6.

X. STEAM-ENGINE INDICATORS. Twelve lectures by Associate Professor Peabody, on Wednesdays and Fridays, at 8 P. M., beginning December 7.

XI. THEORIES AND METHODS OF SOCIAL REFORM. Twelve lectures by Professor Dewey, on Tuesdays and Fridays, at 7.45 P. M., beginning January 3.

XII. THE RAILROAD: ITS DEVELOPMENT AND ITS PROBLEMS. Twelve lectures by Associate Professor Allen, on Mondays and Thursdays, at 8 P. M., beginning January 16.

XIII. MODERN GERMAN LITERATURE. Twelve lectures (in German) by Assistant Professor Dippold, on Tuesdays and Fridays, at 8 P. M., beginning January 17.

XIV. CHEMICAL GEOLOGY. Twelve lectures by Assistant Professor Crosby, on Wednesdays and Fridays, at 7.30 P. M., beginning February 8.

XV. ANALYTIC GEOMETRY OF THREE DIMENSIONS. Twelve lectures by Associate Professor Tyler, on Mondays and Wednesdays, at 7.45 P. M., beginning February 13.

XVI. SURVEYING AND TOPOGRAPHICAL DRAWING. Twelve lectures by Associate Professor Burton, on Mondays and Thursdays, at 7.30 P. M., beginning February 13.

LOWELL SCHOOL OF PRACTICAL DESIGN.

The Lowell School of Practical Design was established in 1872, by the Trustee of the Lowell Institute, for the purpose of promoting industrial art in the United States. The Corporation of the Massachusetts Institute of Technology, having approved the purpose and general plan of the school as proposed by the Trustee of the Lowell Institute, assumed the responsibility of conducting it; and in the same year the first pupils were admitted.

The expenses of this school are borne by the Lowell Institute, and tuition is free to all pupils.

The school occupies a drawing-room and a weaving-room in the building of the Institute on Garrison Street. The weaving-room affords students an opportunity of working their designs into actual fabrics of commercial sizes and of every variety of material and of texture. The room is supplied with two fancy chain-looms for dress goods, three fancy chain-looms for fancy woollen cassimeres, one gingham loom, and one Jacquard loom. The school is constantly provided with samples of all the novelties in textile fabrics from Paris, such as brocaded silks, ribbons, alpacas, armures, and fancy woollen goods.

Course of Study.— Students are taught the art of making patterns for prints, ginghams, delaines, silks, laces, paper-hangings, carpets, oil-cloths, etc. The course is of three years' duration, and embraces:—

1. Technical manipulations; 2. Copying and variations of designs; 3. Original designs or composition of patterns; 4. The making of working drawings, and finishing of designs.

Instruction is given personally to each student over his work, with occasional general exercises. Students supply their own instruments and materials, the cost of which is about $5 per year.

The class is under the personal direction of Mr. CHARLES KASTNER, assisted in the weaving department by Mr. Louis W. Clark, and in the designing department by Miss Ella Louise Shaw.

Requirements for Admission. — To teach drawing is not among the objects of this school. Applicants must therefore possess a sufficient knowledge of drawing to enable them advantageously to begin the work of composition and design.

This implies a considerable degree of skill in freehand drawing from nature, especially in sketching leaves, flowers, and other objects which frequently supply the motives of designs, and also in the use of the brush for drawing outlines and laying flat color. Accuracy and readiness in drawing and an eye for color are required, rather than skill in shading or pictorial art.

Applicants for admission, or persons desiring further information regarding the school, may address the Secretary of the Institute.

Regulations of the School. — The school year begins on the last Monday of September. The number of students in the school, including those to be admitted, will be limited to sixty-five. Examinations for applicants for admission will be held at 9 A. M. on Tuesday, Wednesday, and Thursday of the third week in September. Students are required to be regular in their attendance, the hours being from 9.30 A. M. to 12 M., and from 1 P. M. to 3.30 P. M. Only those students can be retained in the school who, after a fair and patient trial, are found to have some aptitude for the work. At the close of each half-year the Director will, with the approval of the President of the Institute, convey the needed information to such students as shall be found gravely deficient in the qualifications for advantageous pursuit of their studies. No publication will be made of the fact, and such students will be left to withdraw as of their own motion.

REGISTER OF STUDENTS.

NAME.	HOME.	ADDRESS.
Bassett, Sara Ware	*Newton*	Newton.
Battaglia, Orlando Frank	*Roxbury*	22 Centre St., R.
Battles, Frank Elbridge	*Fitchburg*	Fitchburg.
Bird, John Ellis	*Norwood*	Norwood.
Buss, Charles Holmes, Jr.	*Woburn*	Woburn.
Chapman, Thomas Lynwood	*Lowell*	Lowell.
Chase, Kirby Fuller	*Winthrop*	Winthrop.
Child, Robert Coleman	*Richmond, Va.*	59 Elm Hill Ave., R.
Coburn, Lillian Susan	*Tyngsborough*	Tyngsborough.
Cusick, Eugene Fredickery	*Taunton*	Taunton.
Downey, Frank Joseph	*Boston*	74 Westminster St.
Fairbanks, Frank Perley	*Roxbury*	7 Stanmore Pl., R.
Ferry, Grace Elizabeth	*Hyde Park*	Hyde Park.
Follansbee, Catherine Moutrie	*Gloucester*	Gloucester.
Gale, Alice Wellington	*Lynn*	Lynn.
Gray, Henrietta	*Roxbury*	33 Northfield St., R.
Green, Harrie Crosby	*Fitchburg*	24 Marion St., E. B.
Hall, Clarence Allen	*Salem*	Salem.
Hatch, Mabel Josephine	*Boston*	101 W. Chester Pk.
Hicks, Edward Philips	*Hartford, Conn.*	28 St. James Ave.
Kales, Anna Maria	*Chicago, Ill.*	73 Pinckney St.
Keohan, Edward Thomas	*East Boston*	92 Maverick St., E. B.
Lavers, William Everett	*Boston*	3114 Washington St.
Legg, George	*Roxbury*	150 Blue Hill Ave., R.
Lillie, Albert Webster	*Chelsea*	Chelsea.
Locke, Mabel Edith	*Melrose Highlands*	Melrose Highlands.
Manning, Helene	*Cambridgeport*	Cambridgeport.
Meredith, Caroline Amelie	*Boston*	658 Tremont St.
Nyhan, Adelaide	*East Boston*	242 Lexington St., E. B.
Parker, Ella Isabelle	*So. Boston*	770 Broadway, S. B.
Pattillo, Carol Presson	*Gloucester*	Gloucester.
Phalon, Minnie	*So. Framingham*	So. Framingham.
Pierson, Gertrude Elise	*Boston*	75 Chester Sq.
Pitman, Sadie Alden	*New Bedford*	New Bedford.
Richardson, Annabel	*Andover*	Andover.
Sherwin, Eleanor	*Jamaica Plain*	10 Revere St., J. P.

NAME.	HOME.	ADDRESS.
Stevens, Mabel	*Melrose*	Melrose.
Taplin, William Henry	*Charlestown*	42 Elm St., C.
Taylor, Eugene Alfred	*Roxbury*	11 Atherton St., R.
Thurston, Alice C.	*Newport, R. I.*	Somerville.
Torrey, Burton Winthrop	*So. Weymouth*	So. Weymouth.
Twort, Minnie Sara	*Lynn*	Lynn.
Wood, Marietta Bowman	*Dorchester*	55 Bowdoin Ave., D.

ALUMNI ASSOCIATION.

THE Alumni Association of the Institute holds its annual meeting in Boston in December or January; and at the close of each year gives a reception to the graduating class, the Corporation, and the Faculty of the Institute. It includes in its membership all graduates of the Institute.

Its officers for the current year are: —

President: HENRY M. HOWE, '71.

Vice-President: JAMES P. MUNROE, '82.

Secretary: H. W. TYLER, '84.

Executive Committee: THE PRESIDENT, VICE-PRESIDENT, AND SECRETARY, WALTER B. SNOW, '82, ARTHUR T. BRADLEE, 88.

THE NORTHWESTERN ASSOCIATION, MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

President: FREDERICK GREELEY, '76.

Vice-Presidents: FRANK DABNEY, '75, FREDERICK W. CLARK, '80.

Secretary and Treasurer: SOLOMON STURGES, '87, 563 Rookery Building, Chicago, Ill.

THE WESTERN ASSOCIATION, MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

President: EDWARD W. ROLLINS, '71, Ernest & Cranmer Block, Denver, Colo.

Vice-President: THEODORE E. SCHWARZ, '76, Denver, Colo.

Secretary and Treasurer: FRANK E. SHEPARD, '87, 1622 Arapahoe St., Denver, Colo.

REGISTER OF GRADUATES.

The Roman numerals in the column marked "Course" denote the course in which the Graduate received the degree of S. B. For description of courses, see pages 23 to 53.

1868.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
ELLERY C. APPLETON . . Walnut Ave., Revere, Mass.	III.	Civil Engineer; Assistant Engineer, Boston Water Works.
WHITNEY CONANT . . . . Long Branch, N. J.	III.	Secretary, Long Branch Water Supply Co.
*FRANK R. FIRTH . . .	I.	Died June 9, 1872.
ELI FORBES . . . Clinton, Mass.	Sci. and Lit.	Chemist, Lancaster Mills.
CHARLES C. GILMAN . . . Marshalltown, Marshall Co., Ia.	III.	Railroad Contractor.
CHAS. E. GREENE, A. M., C. E. Ann Arbor, Mich.	I.	Professor of Civil Engineering, University of Michigan.
ALBERT F. HALL . . . . 265 Third St., E. Cambridge, Mass.	II.	Constructing Engineer, The George F. Blake Mfg. Co.
WILLIAM E. HOYT . . . Rochester, N. Y.	I.	Chief Engineer, Buffalo, Rochester & Pittsburgh R. R.
ROBERT H. RICHARDS . . Boston, Mass.	III.	Professor of Mining Engineering and Metallurgy, Mass. Institute of Technology.
WALTER H. SEARS . . . Rochester, N. Y.	I.	Civil Engineer, Rochester Water Supply.
*CHARLES A. SMITH . .	I.	Died Feb. 4, 1884.
JOSEPH STONE . . . . . 53 State St., Boston, Mass.	I.	In Business.
BRYANT P. TILDEN . . . Jamestown, N. Dak.	III.	Chief Engineer, Duluth, Pierre & Black Hills R. R.; Assistant Engineer on the "Soo Line."
JAMES P. TOLMAN . . . . 115 Congress St., Boston, Mass.	III.	President, Samson Cordage Works.

1869.

WILLIAM H. BAKER . . Victoria, Texas.	I.	Chief Engineer, Pan American Ry.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
HOWARD A. CARSON . . . 93 Lincoln St., Boston, Mass.	I.	Chief Engineer of the Metropolitan Sewerage Commission of Massachusetts.
J. RAYNER EDMANDS . . . Cambridge, Mass.	II.	In charge of Time Service at Harvard College Observatory.
*WILLIAM RIPLEY NICHOLS	V.	Died July 14, 1886.
CHANNING WHITAKER . . Tyngsborough, Mass.	II.	Reader of Patents.

1870.

*EDWARD K. CLARK . .	II.	Died Sept. 10, 1878.
CHARLES R. CROSS . Boston, Mass.	Sci. and Lit.	Thayer Professor of Physics, Mass. Institute of Technology.
RUSSELL H. CURTIS . . . 107 Dearborn St., Chicago, Ill.	I.	Lawyer.
CHARLES W. HINMAN . . 32 Hawley St., Boston, Mass.	III.	State Inspector of Gas.
SAMPSON D. MASON . . . 412 N. Yakima Ave., Tacoma, Wash.	I.	Assistant Purchasing Agent, Northern Pacific R. R.
N. FREDERICK MERRILL . . Burlington, Vt.	V.	Professor of Chemistry, University of Vermont.
THEODORE F. TILLINGHAST . 37 8th St., New Bedford, Mass.	I.	
EDMUND K. TURNER . . 53 State St., Boston, Mass.	I.	Civil Engineer.
DANIEL W. WILLARD . . 55 Broadway, New York, N. Y.	II.	Of the Firm of Babb, Cook & Willard, Architects.
LAURENCE F. J. WRINKLE . Keeler, Cal.	III.	Superintendent, Inyo Development Co.

1871.

FOSTER, E. L. BEAL . . . 1452 Corcoran St., Washington, D. C.	I.	Biological Clerk, Department of Agriculture.
*ADDISON CONNOR, A. B. .	I.	Died Jan. 4, 1891.
*HENRY M. CUTLER . . .	I.	Died May 16, 1877.
*ELMER FAUNCE	III.	Died July 6, 1882.
EDWARD H. FOOTE . . . 31 Commercial St., Boston.	I.	Of the Firm of Skilton, Foote & Co., Manufacturers of Pickles.
FRANK L. FULLER . . . 12 Pearl St., Boston, Mass.	I.	Civil and Hydraulic Engineer.
HENRY M. HOWE, A. M. . 287 Marlboro' St., Boston, Mass.	III.	Consulting Metallurgist; Lecturer on Metallurgy, Mass. Institute of Technology.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
ALBERT H. HOWLAND, A. M. 60 Congress St., Boston, Mass.	I.	Civil Engineer.
G. RUSSELL LINCOLN . . . Boston, Mass.	III.	Assistant in Sanitary Chemistry, Mass. Institute of Technology.
WILLIAM A. PIKE . . . . 630 Guaranty Loan Building, Minneapolis, Minn.	I.	Consulting Engineer; Lecturer on Mechanical Engineering, University of Minnesota.
GEORGE H. PRATT . . . . 31 Tenth St., Long Island City, N. Y.	V.	Chemist, with D. D. Williamson.
EDWARD W. ROLLINS . . . Ernest & Cranmer Block, Denver, Colo.	III.	Banker, E. H. Rollins & Sons; President, Denver Consolidated Electric Co.
WALTER W. SMITH . . . Dayton, Ohio.	II.	Builder of Steam Pumps and Hydraulic Machinery (Smith, Vaile & Co.).
CHARLES F. STONE . . . Waltham, Mass.	III.	Treasurer, Waltham Savings Bank.
*ALMARIN TROWBRIGDE, JR.	II.	Died Dec. 5, 1878.
SAIAH S. P. WEEKS . . . Lincoln, Neb.	I.	Chief Engineer, Burlington & Missouri River R. R. in Nebraska.
RANDAL WHITTIER . . . Commerce Building, Louisville, Ky.	V.	Cashier, Kentucky Branch Office, New York Life Insurance Co.

1872.

C. FRANK ALLEN . . . . Boston, Mass.	I.	Associate Professor of Railroad Engineering, Mass. Institute of Technology.
BENJAMIN E. BREWSTER . . Glen Road, Jamaica Plain, Mass.	III.	Stock Raising.
WILLIAM B. DODGE . . . Columbus, Ohio.	I.	Scale Inspector, Pittsburgh, Cincinnati Chicago & St. Louis Ry.
FREDERIC A. EMMERTON . 214 Richard St., Joliet, Ill.	V.	Superintendent of Blast Furnaces, Joliet Works, Illinois Steel Co.
JAMES A. HERRICK . . . 284 Pearl St., New York.	V.	Consulting Engineer and Furnace Builder.
JAMES M. HODGE . . . . Big Stone Gap, Va.	III.	Engineer and Geologist.
BRADFORD H. LOCKE . . Central City, Colo.	III.	Mining Engineer.
CHAS S. MINOT, S. D. (Harv.) Boston, Mass.	V.	Professor of Histology and Embryology, Harvard Medical School.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
MAURICE B. PATCH . . . 1 Austin St., Buffalo, N. Y.	III.	Superintendent, Buffalo Smelting Works, Calumet & Hecla Mining Co.
WALTER SHEPARD, A. B. . 4 Arion St., Dorchester, Mass.	I.	Assistant Engineer, Boston & Albany R. R.
RICHARD H. SOULE, A. B. . Roanoke, Va.	II.	Superintendent of Motive Power, Norfolk & Western R. R.
CLARENCE S. WARD . . . 27 School St., Boston, Mass.	III.	Treasurer of the Standard Gas Fuel Co.; Lawyer, Vice-President and General Manager, Standa. Gas Meter Co.; Treasurer, Columbia Safety Steamship Co.

1873.

AMORY AUSTIN, A. B. . . 23 Catherine St., Newport, R. I.	V.	
GEORGE W. BLODGETT . . Central St., Auburndale, Mass.	I.	Electrical Engineer, Boston & Albany R. R.; Consulting Electrician.
WILLIAM E. BROTHERTON . Cincinnati, Ohio.	V.	Book-keeper, Second National Bank.
*SAMUEL A. FABENS, JR. .	I.	Died March 14, 1875.
SAMUEL M. FELTON . . . 80 Broadway, New York, N. Y.	I.	President of East Tennessee, Virginia & Georgia Ry., and of Cincinnati, New Orleans & Texas Pacific Ry.
FREDERICK L. FISHER . . Medway, Mass.	I.	Insurance Agent and Broker, Medway, and 35 Kilby St., Boston.
FRED. GUILD, JR. 114 Dudley St., Boston, Mass.	Sci. and Lit.	In Business.
W. DALE HARRIS . . . 237 MacLaren St., Ottawa, Ont.	I.	Chief Engineer, Pontiac Pacific Junction Ry.; Chief Engineer, Ottawa & Gatineau Valley Ry.
CLAR. L. HOWES, A. B., M. D., Hanover, Mass.	II.	Physician.
*WILLIAM P. JEWETT . .	I.	Died Jan. 4, 1884.
*WILLIAM A. KIMBALL . .	II.	Died December, 1887.
*WILLIAM C. MAY . . .	V.	Died March 11, 1878.
FRANK B. MORSE . . . Murphy's, Cal.	I.	Superintendent, Willard Mining Co.; Agent, Norfolk Mine.
CHARLES O. PARSONS . . 50 State St., Boston, Mass.	III.	Consulting Mining Engineer.
GEORGE PHILLIPPS	III.	
HENRY A. PHILLIPS . . . 53 State St., Boston, Mass.	IV.	Architect and Superintendent.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
ELLEN H. RICHARDS, A. M. Boston, Mass.	V.	Instructor in Sanitary Chemistry, Mass. Institute of Technology.
HENRY L. RIPLEY . . . . Fort Brown, Tex.	I.	First Lieutenant, Third Cavalry, U. S. A.
ROBERT A. SHAILER . . . 138 Jackson St., Chicago.	I.	Of the firm of Shailer & Schniglau, Engineers and Contractors.
C. EDWARD STAFFORD . . Care Shoenberger & Co., Pittsburgh, Pa.	III.	Superintendent, Bessemer and Open Hearth Departments, Juniata Iron and Steel Works.
SAMUEL E. TINKHAM . . 126 Thornton St., Roxbury, Mass.	I.	Civil Engineer, City Engineer's Office, Boston; Secretary, Boston Society of Civil Engineers.
FRANK W. VERY . . . . Allegheny, Pa.	V.	Adjunct Professor of Astronomy and Instructor in Geology, Western University of Pennsylvania.
WEBSTER WELLS . . . . Boston, Mass.	I.	Associate Professor of Mathematics, Mass. Institute of Technology.
RANDAL WHITTIER . . .	I.	(See record of Class of 1871.)
FRANCIS H. WILLIAMS, M. D. 23 Marlboro' St., Boston.	V.	Assistant Physician, Boston City Hospital.
LOUIS F. WOOD . . . . 440 Atlantic Ave., Boston.	V.	Chemical, Color, and Varnish Manufacturer.

1874.

HERBERT BARROWS . . . Reading, Mass.	I.	
GEORGE H. BARRUS . . . 95 Milk St., Boston, Mass.	II.	Expert and Consulting Steam Engineer.
WILLIAM T. BLUNT . . . Cleveland, Ohio.	I.	U. S. Assistant Engineer.
GEORGE E. DOANE . . . Middleboro', Mass.	I.	Of the Firm of J. & G. E. Doane, Hardware.
WILLIAM DOWSE . . . 676 Broadway, New York.	IV.	Of the Metropolitan Rubber Co.
JOSEPH S. EMERSON . . . Honolulu, Hawaiian Islands.	I.	Engineer and Surveyor.
ELIOT HOLBROOK . . . . Pittsburgh, Pa.	I.	Superintendent, Baltimore & Ohio R. R.
AECHIRAU HONGMA . . . Railway Office, Nagano, Nagano-Ken, Japan.	I.	Civil Engineer, Imperial Government Railways.
CHARLES P. HOWARD . . Hartford, Conn.	I.	Secretary, J. L. Howard & Co., Dealers in Railway and Car Builders' Supplies.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
FRANK H. JACKSON . . . 145 South Broadway, Los Angeles, Cal.	III.	Mining and Hydraulic Engineer, Firm of J. P. Culver & Co.
*WILLIS H. MYRICK . . .	II.	Died Oct. 17, 1875.
HERBERT B. PERKINS . . . Pasadena, Cal.	I.	Professor of Mechanical Drawing, Throop University.
FRANK H. POND . . . . 709 Market St., St. Louis, Mo.	II.	President, Pond Engineering Co.
EDWARD S. SHAW . . . . 146 Franklin St., Boston.	I.	Consulting Engineer.
FRANCIS H. SILSBEE . . . Lawrence, Mass.	II.	Superintendent, Cotton Department, Pacific Mills.
*ARTHUR W. SWEETSER . .	I.	Died April 10, 1878.
*ROBERT C. WARE, Sci. and Lit.		Died June 25, 1883.
STEPHEN H. WILDER, Sci. and Lit. 64 W. Third St., Cincinnati, Ohio.		Attorney-at-Law.

1875.

SAMUEL E. ALLEN . . . . 67 Chauncy St., Boston, Mass.	I.	Agent for the Nashawannuck Manufacturing Co.
JAMES L. ARNOTT, Sci. and Lit. Manchester, N. H.		In charge of Draughting Department, Amoskeag Mills.
AMOS J. BOYDEN . . . . 413 Walnut St., Philadelphia.	IV.	Architect (of the Firm Boyden & Taylor).
MOSES D. BURNET . . . . 704 James St., Syracuse, N.Y.	III.	Banker and Broker.
HENRY K. BURRISON . . . Boston, Mass.	I.	Instructor in Drawing, Mass. Institute of Technology.
CHRISTOPHER A. CHURCH . Lexington, Ky.	I.	In Collector's Office, 7th District, Kentucky.
FRANK S. DODGE . . . . Honolulu, Hawaiian Islands.	I.	Civil Engineer and Surveyor, in charge of City Work, Office of Government Survey.
EDGAR S. DORR . . . . 14 Beacon St., Boston, Mass.	I.	Assistant Engineer, Sewer Department.
WILLIAM C. EDES. . . . Fourth and Townsend Sts., San Francisco, Cal.	I.	Civil Engineer.
CHARLES W. GOODALE . . Butte City, Mont.	III.	Mine Superintendent, Colorado Smelting and Mining Co.
EDWARD A. W. HAMMATT . 5 Pemberton Sq., Boston.	I.	Civil and Hydraulic Engineer.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
EDWARD A. HANDY . . . 15 Olive St., Cleveland, Ohio.	I.	Chief Engineer, Lake Shore & Michigan Southern R. R.
*JAMES H. HEAD . . .	II.	Died Aug. 18, 1875.
THOMAS HIBBARD . . . West Roxbury, Mass.	II.	Treasurer of the George Lawley & Son Corporation, South Boston, Mass.
*WILLIAM F. HUNTINGTON	I.	Died Aug. 7, 1877.
L. P. KINNICUTT, S. D. (Harv.) 77 Elm St., Worcester, Mass.	V.	Professor of Chemistry, Worcester Polytechnic Institute.
WILFRED LEWIS . . . 3234 Powelton Ave., Philadelphia, Pa.	II.	Assistant Engineer, with William Sellers & Co.
SAMUEL J. MIXTER, M. D., 180 Marlboro St., Boston.	VIII.	Physician; Demonstrator of Anatomy, Harvard Medical School; Visiting Surgeon Carney Hospital; Surgeon to Outpatients, Mass. General Hospital.
BENJAMIN A. OXNARD . . Cypremont, La.	III.	Sugar Planter.
THOMAS D. PLIMPTON . Walpole, Mass.	II.	In Business.
WILLIAM A. PRENTISS, Holyoke, Mass.	Sci. and Lit.	Of the Firm of Geo. W. Prentiss & Co., Manufacturers of Wire.
FRANCIS T. SARGENT . . Mount Heagan, Prospect Ferry, Me.	II.	President and General Manager, Sargent Granite Co.
WELLAND F. SARGENT . . 97 Washington St., Chicago, Ill.	I.	Civil Engineer and Surveyor,
WILLIAM H. SHOCKLEY . Candalaria, Esmeralda Co., Neb.	III.	Superintendent and General Manager, Mount Diablo Mill and Mining Co.
JAMES B. STANWOOD . . . Cincinnati, Ohio.	II.	Mechanical Engineer; Director, Cincinnati Technical School.
H. L. J. WARREN	III.	
WILLIAM R WEBSTER . . 413 Walnut St., Philadelphia, Pa.	III.	Civil Engineer and Bridge Inspector.

1876.

CHARLES F. ALLEN . . . Care N. H. Allen, Osterville, Mass.	III.	Mining Engineer and Metallurgist.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
THOMAS ASPINWALL . . . 12 Pearl St., Boston, Mass.	I.	Civil Engineer.
WILLIAM P. ATWOOD . . Belmont Ave. and Mansur St., Lowell, Mass.	V.	Chemist, Hamilton Print Works.
THOMAS W. BALDWIN, A. B. Exchange Block, Bangor, Me.	I.	Civil Engineer.
WALTER B. BARROWS . . Washington, D. C.	VII.	First Assistant Ornithologist, Department of Agriculture.
AARON D. BLODGETT . . 383 Federal St., Boston, Mass.	II.	Manufacturing Electrician.
JOSHUA B. F. BREED . . 1348 Second St., Louisville, Ky.	I.	Senior Assistant City Engineer.
HARRY T. BUTTOLPH . . Buffalo, N. Y.	I.	Assistant City Engineer, in charge of Paving.
FREDERICK K. COPELAND . 15 North Clinton St., Chicago.	I.	President Sullivan Machine Co.
WILLIAM O. CROSBY . . . Boston, Mass.	VII.	Assistant Professor of Structural and Economic Geology, Mass. Institute of Technology.
WILLIS E. Davis . 401 California St., San Francisco, Cal.	Sci. and Lit.	
*CLARENCE L. DENNETT .	II.	Died June 5, 1878.
CHARLES R. FLETCHER . . 82 Equitable Building, Boston.	V.	Consulting Chemist and Metallurgist.
JOHN R. FREEMAN . . . 31 Milk St., Boston, Mass.	I.	Engineer and Assistant Chief of Inspection Department, The Associated Factory Mutual Insurance Companies.
FRANCIS E. GALLOUPE . . 30 Kilby St., Boston, Mass.	II.	Mechanical Engineer.
*ROBERT H. GOULD.	Metallurgy.	Died Nov. 19, 1878.
JOHN B. HENCK, JR. . . . Schenectady, N. Y.	VIII.	With General Electric Co., Schenectady Works.
FRANK W. HODGDON . . . Arlington, Mass.	I.	Engineer, Harbor and Land Commissioners of Massachusetts.
SUMNER HOLLINGSWORTH . 44 Federal St., Boston, Mass.	II.	President, Hollingsworth & Whitney Co.
SILAS W. HOLMAN . . . . Boston, Mass.	VIII.	Associate Professor of Physics, Mass. Institute of Technology.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
ALFRED E. HUNT . . . . 116 Water St., Pittsburgh, Pa.	III.	Of the Firm of Hunt & Clapp, Chemists and Metallurgical Engineers, Pittsburgh Testing Laboratory; President of Pittsburgh Reduction Co.
WILLIAM W. JACQUES, Ph. D. 95 Milk St., Boston, Mass.	VIII.	Electrician of the American Bell Telephone Co.
SAMUEL JAMES, JR. . . . . Pioche, Nev.	III.	Superintendent of Smelter, Pioche Mining and Reduction Co.
ALFRED C. KILHAM . . . North Springfield, Mo.	II.	Employed in Motive Power Department, St. Louis & San Francisco R. R.
J. AUSTIN KNAPP	II.	
THEODORE J. LEWIS . . . 212 North Thirty-fourth St., Philadelphia, Pa.	II.	Secretary and Assistant Treasurer, Standard Steel Works.
ALBERT H. LOW . . . . P. O. Box 2395, Denver, Colo.	V.	Chemist.
CHARLES T. MAIN . . . . 53 State St., Boston.	II.	Of Dean & Main, Mill and Mechanical Engineers.
ARTHUR L. MILLS . . . . 2272 Ashland Ave., Toledo, Ohio.	I.	Chief Engineer, Toledo, St. Louis & Kansas City R. R.
WILLIAM E. NICKERSON . . 111 North Ave., Cambridge, Mass.	V.	Mechanical and Chemical Expert with Beacon Vacuum Pump & Electrical Co., Boston.
DAVID W. PHIPPS . . . . 1114 Depot St., Seattle, Wash.	Phil.	Attorney-at-Law.
CHARLES F. PRICHARD . . Lynn, Mass.	II.	General Superintendent of Lynn Gas & Electric Co.
HENRY RAEDER . . . . 218 La Salle St., Chicago, Ill.	I.	Architect.
CHARLES L. RICH . . . . East Jaffrey, N. H.	I.	Cashier, Monadnock National Bank.
*THOMAS W. ROBINSON . .	III.	Died Nov. 3, 1880.
CHARLES A. SAWYER, 125 Dearborn St., Chicago.	Sci. and Lit.	In Real Estate Business.
THEODORE E. SCHWARZ . 17th and Arapahoe Sts., Denver, Colo.	III.	Mining Engineer.
JULIUS H. SUSMANN . . . Newton Highlands, Mass.	III.	Out of Business.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
WALTER D. TOWNSEND . . Chemulpo, Korea.	III.	Of the Firm of Morse, Townsend & Co., Merchants.
CHARLES N. WAITE . . . Rumford Falls, Me.	V.	Superintendent, Chemical Association Works.
HENRY M. WAITT . . . Chicago, Ill.	I.	Bridge Engineer, with Chicago, Burlington & Quincy R. R.
*ROBERT C. WARE . . .	Phil.	Died June 25, 1883.
HENRY B. WOOD . . . . City Hall, Boston, Mass.	I.	Secretary and Executive Engineer, Consolidated Street Department.

1877.

JOHN ALDEN . . . . . Lawrence, Mass.	V.	Chemist, Pacific Mills.
CHARLES S. BACHELDER . Watsonville, Cal.	V.	Chemist, Western Beet Sugar Co.
GEORGE BARTOL . . . . Cleveland, Ohio.	III.	In charge of Mill and Forge Department, Otis Iron and Steel Works.
J. WILLIAMS BEAL . . . Mason Building, Boston.	IV.	Architect.
WILLIAM H. BEECHING . . 2 Blackstone St., Boston.	II.	Cork Manufacturer.
G. WALTER CAPEN . . . 45 Kilby St., Boston, Mass.	IV.	Architect.
HENRY H. CARTER . . . City Hall, Boston, Mass.	I.	Superintendent of Streets.
WILLIAM E. CHAMBERLIN . 6 Beacon St., Boston, Mass.	IV.	Of the Firm of Chamberlin & Austin, Architects.
*GEORGE H. CHAPMAN . .	II.	Died Jan. 21, 1879.
LINUS FAUNCE . . . . Boston, Mass.	II.	Assistant Professor of Drawing, Mass. Institute of Technology.
CHARLES H. FISHER . . Ponkapog P. O., Canton, Mass.	II.	Mechanical Engineer.
*WILLIAM C. FLINT . . .	III.	Died June 14, 1881.
PIERCE P. FURBER, B. C. E. Security Building, St. Louis, Mo.	IV.	Architect; of Firm of Peabody, Stearns & Furber.
MARTIN GAY . . . . . New York, N. Y.	I.	Assistant Engineer, Department of Public Works and Parks.
JOSEPH P. GRAY . . . . 125 Grand St., Lowell, Mass.	I.	With Boston Manufacturers' Mutual Insurance Co., Boston, Mass.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
EDMUND GROVER . . . . East Walpole, Mass.	I.	Civil Engineer.
RICHARD A. HALE . . . Lawrence, Mass.	I.	Principal Assistant Engineer with the Essex Water Power Co.
JOHN E. HARDMAN . . . Box 520, Halifax, N. S.	III.	Mining Engineer; Manager, Oldham Gold Co., Oldham, N. S., West Waverley Gold Co., Waverley, N. S., The Napier Mining Co., Ltd., N. S.
HENRY D. HIBBARD . . . High Bridge, N. J.	III.	Superintendent, Steel Department, Taylor Iron and Steel Co.
WALTER JENNEY . . . . 55 G St., So. Boston, Mass.	III.	Superintendent, Petroleum Refinery, Jenney Manufacturing Co.
*JOSEPH KIRK	II.	Died July, 1886.
GEORGE W. KITTREDGE . . Cincinnati, Ohio.	I.	Chief Engineer, Cleveland, Cincinnati, Chicago & St. Louis Ry.
CHARLES F. LAWTON . . Niagara Falls, N. Y.	I.	Civil Engineer with the Cataract Construction Company.
BENJAMIN C. MUDGE . . 53 State St., Boston, Mass.	I.	In Business.
CECIL H. PEABODY . . . Boston, Mass.	II.	Associate Professor of Steam Engineering, Mass. Institute of Technology.
ARTHUR L. PLIMPTON . . 81 Milk St., Boston, Mass.	I.	Engineer, West End Street Railway.
HARRY C. SOUTHWORTH . West Stoughton, Mass.	III.	
*CHARLES E. STEWART . .	I.	Died Oct. 7, 1877.
THOMAS F. STIMPSON . . Providence, R. I.	III.	Overseer, Printing Department, Silver Spring Bleaching and Dyeing Co.
GEORGE F. SWAIN . . . Boston, Mass.	I.	Hayward Professor of Civil Engineering, Mass. Institute of Technology.
*FRANK E. WIGGIN . . .	I.	Died Dec. 21, 1890.
FREDERICK W. WOOD . . Sparrow's Point, Md.	I.	President, Maryland Steel Co.

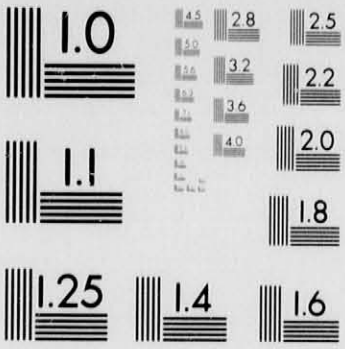
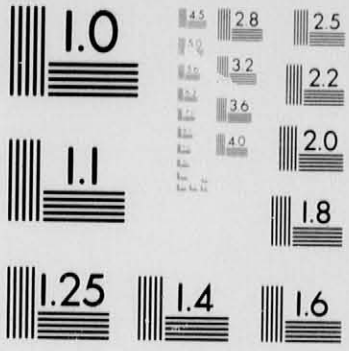
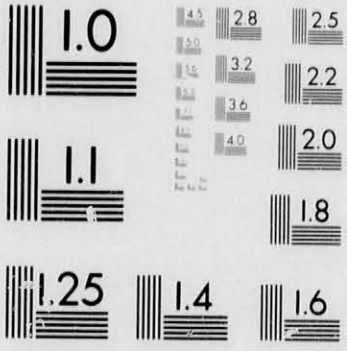
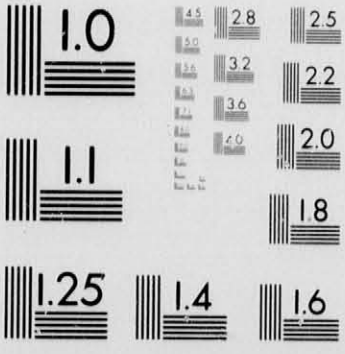
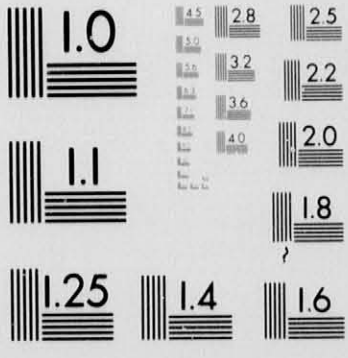
1878.

WILLIAM B. ALLBRIGHT . Union Stock Yards, Chicago.	V.	Manager, Swift & Co., Lard Refinery.
CHARLES M. BAKER . . . Ames Building, Boston, Mass.	IV.	With Chase & Barstow, Stock Brokers.
TAKUMA DAN . . . . . Mieke, Japan.	III.	Director, Mieke Imperial Coal Mining Co.
CHARLES S. EATON . . . 219 Washington St., Boston.	IV.	In Business.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
ALFRED S. HIGGINS . . . 35 Howard St., Boston.	IV.	With R. R. Higgins & Co.
JULIAN A. KEBLER . . . Boston Building, Denver, Colo.	I.	General Manager, Colorado Fuel Co.
*FRANK H. MORGAN . .	V.	Died Dec. 5, 1889.
EVERELL J. NICHOLS . . 67 Ferry St., Everett, Mass.	I.	Civil Engineer.
FREDERICK H. PRENTISS . 203 Broadway, New York.	II.	President, The Buckeye Electric Co.
JAMES RITCHIE . . . . Cincinnati, Ohio.	I.	Principal Assistant Engineer, Cleveland, Cincinnati, Chicago & St. Louis Ry.
JAMES W. ROLLINS, JR. . . West Roxbury, Mass.	I.	Resident Engineer, Old Colony R. R., Dedham, Mass.
C. D. SAWIN, M. D., 349 Main St., Charlestown, Mass.	Sci. and Lit.	Physician.
PETER SCHWAMB . . . . Boston, Mass.	II.	Associate Professor of Mechanism, Mass. Institute of Technology.
FREDERIC P. SPALDING . . 470 Middlesex St., Lowell, Mass.	I.	Civil Engineer, City Engineer's Office, Boston.
ISAAC M. STORY . . . . Somerville, Mass.	I.	Assistant Engineer, New York & New England R. R.
*EDMUND TANEY	I.	Died May 1, 1890.
LINWOOD O. TOWNE . . . Haverhill, Mass.	III.	Sub-Master, Haverhill High School.
EMILE F. WILLIAMS . . . 81 Franklin St, Boston.	I.	Of the Firm, Arthur Williams, Jr., & Co., Importers of East India and China Goods.
JAMES G. WOOLWORTH . . 246 Fountain St., Providence, R. I.	V.	Chemist.

1879.

WALTER S. ALLEN . . . 24 West St., Boston, Mass.	V.	With Bay State Gas Co.
SAMUEL T. BRALEY . . . 14 Park St., Rutland, Vt.	II.	Mechanical Engineer.
JOHN W. CABOT . . . . Pottstown, Pa.	III.	Mining Engineer.
HARRY H. CAMPBELL . . . Steelton, Dauphin Co., Pa.	III.	Assistant Superintendent, Pennsylvania Steel Co.
FREDERICK S. COFFIN . . 152 Congress St., Boston.	III.	Of the Firm of Stoddard, Lovering & Co., Importers and Commission Merchants.


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NAME AND RESIDENCE.	COURSE.	OCCUPATION.
W. OTIS DUNBAR . . . . Altoona, Pa.	II.	In charge of Test Department, Pennsylvania R. R.
GEORGE W. FABENS . . . Ottumwa, Iowa.	I.	Division Roadmaster, Chicago, Burlington & Quincy R. R.
CHARLES S. GOODING . . 28 School St., Boston, Mass.	II.	Mechanical Engineer and Draughtsman.
*ERNEST G. HARTWELL . .	IV.	Died Sept. 22, 1889.
RAPHAEL M. HOSEA . . . 1657 Larimer St., Denver, Colo.	I.	Chief Engineer with the Colorado Fuel Co., the Colorado Coal and Iron Co., the Grand River Coal and Coke Co.
HORACE J. HOWE . . . . Galion, Ohio.	I.	Roadmaster, New York, Pennsylvania & Ohio R. R.
FREDERICK B. KNAPP . . Duxbury, Mass.	I.	Principal, Powder Point School.
FRED. H. LANE . . . . 49 Leonard St., New York, N. Y.	II.	With Allen, Lane & Co., Commission Merchants.
FRED. R. LORING . . . . Markt 11, Weimar, Germany.	VII.	Student.
WILLIAM W. MACFARLANE . 613 E. Fourteenth St., Chester, Pa.	V.	Superintendent, John M. Sharpless & Co., Manufacturers of Dyestuffs.
ARTHUR H. METCALF . . Pawtucket, R. I.	II.	Mechanical Engineer.
EDWIN C. MILLER . . . Wakefield, Mass.	II.	Assistant Superintendent, Henry F. Miller & Sons' Piano Co.
*EDWARD H. OWEN, JR. .	II.	Died July 3, 1890.
WILLIAM H. PICKERING . Cambridge, Mass.	VIII.	Astronomer, Harvard College Observatory.
GEORGE F. RIGGS . . .	I.	
FRANK G. STANTIAL . . Melrose, Mass.	V.	Superintendent, Cochrane Chemical Co., Everett, Mass.
WILLIAM S. STEARNS . . Wyoming, Ohio.	I.	Superintendent, Stearns & Foster Co.'s Cotton Factory, Cincinnati, Ohio.
ARTHUR M. WAITT . . . Cleveland, Ohio.	II.	General Master Car Builder, Lake Shore & Michigan Southern Ry.

1880.

GEORGE H. BARTON . . . Boston, Mass.	III.	Instructor in Geology, Mass. Institute of Technology.
CHARLES H. BROWN . . Willington, Conn.	I.	

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
EDWIN E. CHASE . . . Mining Exchange Building, Denver, Colo.	I.	Mining Engineer and United States Deputy Mineral Surveyor.
FREDERICK W. CLARK . . 2 and 4 Sherman St., Chicago, Ill.	III.	Vice-President and Engineer, Jonathan Clark & Sons' Co.
GEORGE W. HAMILTON . . 14 Beacon St., Boston, Mass.	I.	With the Sewer Department, City of Boston.
LORING R. MILLEN . . . 16 Beaver St., New York.	III.	Lumber Merchant and Manufacturer.
WILLIAM T. MILLER . 156 Tremont St., Boston, Mass.	Elective.	Salesman, with Henry F. Miller & Sons' Piano Co.
*NATHANIEL C. SMALL . .	V.	Died July 14, 1880.

1881.

IRA ABBOTT . . . . . 150 Broadway, New York, N. Y.	I.	Civil Engineer.
JOHN H. ALLEN . . . . El Paso, Texas.	III.	Metallurgist, El Paso Smelting Works.
*JAMES S. ATKINSON . . .	II.	Died Dec. 17, 1883.
AMOS BINNEY, A. B. . . . Westcott St., Dorchester, Mass.	V.	Real Estate Agent, 53 State St., Boston.
DAVID S. BISSELL . . . . Pittsburgh, Pa.	III.	President, Duquesne Forge Co., Iron and Steel Forgings.
FRANK H. BRIGGS . . . 45 High St., Boston, Mass.	IX.	Merchandise Broker, W. L. Montgomery & Co.
FRANK E. CAME . . . . 69 Imperial Building, Montreal, Que.	I.	Manager Canadian Bridge and Iron Co.
FRANK D. CHASE . . . . Parral, Mexico.	III.	Chemist and Assayer.
BENJAMIN G. COLLINS . . Edgartown, Mass.	II.	Surveyor.
HARRY H. CUTLER . . . Waltham, Mass.	II.	Manufacturing Electrician.
F. GRAEF DARLINGTON . . 676 North Delaware St., Indianapolis, Ind.	IX.	Superintendent, Indianapolis Division, Pittsburgh, Cincinnati, Chicago & St. Louis Ry.
JOHN DUFF, M. D. . . . 5 Dexter Row, Charlestown, Mass.	V.	Physician.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
DAVID S. GODDARD . . . 450 Middlesex St., Lowell, Mass.	III.	With U. S. Cartridge Co.
*MARIE G. HOLMAN A. M.	V.	Died May 5, 1885.
WALTER J. KOEHLER. . . Broken Hill, N. S. W., Australia.	V.	Assistant Metallurgist, Broken Hill Proprietary Co.
EDWIN J. LEWIS, JR. . . 9 Park St., Boston, Mass.	IV.	Architect.
WILLIAM B. LINDSAY, A. B. Carlisle, Pa.	V.	Professor of Chemistry, Dickinson College
JAMES LUND . . . . . 66 James St., Malden Mass.	V.	Superintendent, West Department, Cochrane Chemical Co.
GEORGE A. MOWER . . . 75 Queen Victoria St., London, Eng.	II.	General Manager, Sturtevant Blower Co., London, Eng.
WEBSTER NORRIS . . . . Melrose, Mass.	III.	Chemist, Boston Rubber Shoe Co.
EVELYN W. ORDWAY . . New Orleans, La.	V.	Professor of Chemistry and Physics, Newcomb College, Tulane University.
THEODORE PARKER . . . Atlantic, Mass.	I.	Park Department, City of Boston.
NATHANIEL W. SHED . . Burden, N. Y.	V.	Chemist for Hudson River Ore and Iron Co.
WILLIAM R. SNEAD . . . 318 West Chestnut St., Louisville, Ky.	IV.	General Manager, The Snead Co. Iron Works.
HAROLD E. STEARNS. . . Montreal, Que.	II.	Treasurer, Dominion Wadding Co.
EDWARD R. WARREN . . Crested Butte, Colo.	VII.	United States Deputy Mineral Surveyor
CHARLES M. WILKES . . Winona, Minn.	IV.	Civil Engineer.
ARTHUR WINSLOW . . . Jefferson City, Mo.	III.	State Geologist.

1882.

CLARA P. AMES . . . . Northampton, Mass.	V.	Teacher in Girls' Classical School.
THOMAS B. CARSON . . . 709 Perry St., Davenport, Iowa.	II.	Secretary of the Bettendorf Metal Wheel Co., Davenport, Ia., and Springfield, O.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
CARRIE RICE CLARK . . . Denver, Colo.	V.	
EDWARD F. ELY, A. B. . . 874 Broadway, New York.	IV.	Architect.
GEORGE FAUNCE, A. B. . . Mansfield Valley, Allegheny Co., Pa.	III.	Superintendent, Pennsylvania Lead Co.
*HARRY A. FOSS	II.	Died Aug. 19, 1885.
CHARLES A. FRENCH . . 3 Winter St., Boston, Mass.	III.	In Business.
HOWARD V. FROST, Ph. D. . Brooklyn, N. Y.	V.	Professor of Chemistry, Polytechnic Institute.
EDW. G. GARDINER, Ph. D. . 131 Mt. Vernon St., Boston.	VII.	
FRANCIS P. HALL . . . . Emporia, Kans.	V.	Stock-raising.
GEORGE L. HEINS . . . 7 Beekman St., New York.	IV.	Of Form of Heins & LaFarge, Architects.
CHARLES D. JENKINS . . 32 Hawley St., Boston, Mass.	V.	Assistant State Inspector of Gas.
JAMES W. JOHNSON . . . Riverside, Cal.	I.	City Engineer and Superintendent of Streets.
JOHN F. LOW . . . . . Chelsea, Mass.	V.	Treasurer, Low Art Tile Co.
HARRY G. MANNING . . Watertown, N. Y.	II.	Superintendent of the Eames Vacuum Brake Co.
GEORGE W. MANSFIELD . . 620 Atlantic Ave., Boston.	III.	With the Thomson-Houston Electric Co.
FRANK C. MORRISON . . Boston, Mass.	I.	With the West End Street Railway Co.
JAMES P. MUNROE . . . 179 Devonshire St., Boston.	III.	Of the Firm of Jas. S. Munroe & Co., Paper Manufacturers.
WILLIAM T. RIPLEY . . . 513 North E St., Tacoma, Wash.	II.	Manufacturer.
HENRY F. ROSS . . . . Jamaica Plain, Mass.	III.	With Boston Thread and Twine Co.
JOHN H. ROSS . . Sci. and Lit. Jamaica Plain, Mass.		Superintendent, Boston Thread and Twine Co.
GRENVILLE T. SNELLING . 50 West 9th St., New York.	IV.	Instructor in Architecture, School of Mines, Columbia College.
WALTER B. SNOW . . . Watertown, Mass.	II.	Chief Draughtsman with B. F. Sturtevant Co., Jamaica Plain.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
ANTHONY C. WHITE . . . 42 Farnsworth St., South Boston, Mass.	VIII.	With The American Bell Telephone Co.

1883.

HERBERT T. BARDWELL . Parker Hill Ave., Boston.	I.	Civil Engineer.
GEORGE H. BRYANT . . . Palo Alto, Cal.	II.	Assistant Professor of Mechanical Engineering, Leland Stanford, Jr., University.
HARVEY S. CHASE . . . . 1 Broadway, New York, N. Y.	II.	Treasurer International Ore Separating Co.
FRANK E. DAVIS . . . . 4 Cushman St., Plymouth, Mass.	II.	General Manager, Atlantic Covering Co.
JOHN G. EPPENDORFF . . 134 Wabash Ave., Chicago.	IV.	Decorator
GEORGE J. FORAN . . . . 731 Main St., Cambridge, Mass.	II.	With The Geo. F. Blake Manufacturing Co.
WILLIAM B. FULLER . . 59 Mountain Ave., Malden, Mass.	I.	Civil Engineer.
HORACE B. GALE . . . . 40 California St., San Francisco, Cal.	II.	Mechanical and Electrical Engineer.
GEORGE H. GUSTIN . . . 110 Broad St., Charleston, S. C.	III.	Superintendent Bowker Fertilizer Co.
FREDERIC O. HARRIMAN . Jaltipan, Mex.	I.	Civil Engineer and Contractor.
JAMES A. HUTCHINGS . .	II.	
H. WARD LEONARD . . . Electrical Exchange Building, Liberty St., New York.	III.	President, H. Ward Leonard Co., Electrical Engineers.
HARVEY M. MANSFIELD . . Fairfield, Me.	III.	Superintendent, Somerset Fibre Co.
ROBERT W. SCOTT . . . 716 Sansom St., Philadelphia.	II.	Manage[illegible]hiladelphia Heliographic Co.
GEORGE A. SMITH . . . Arlington, Mass.	V.	Of the Firm of Thos. Strahan & Co., Manufacturers of Wall Paper, Chelsea, Mass.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
FRANK TENNEY . . . . Steelton, Dauphin Co., Pa.	III.	Assistant to General Manager, Pennsylvania Steel Co.
CHARLES H. TOMPKINS, JR. Boise City, Idaho.	III.	Engineer and Manager, Idaho Mining and Irrigation Co.
GEORGE R. UNDERWOOD . Peabody, Mass.	V.	Superintendent, Upton Glue Works.
DAVID WESSON . . . . 29 Broadway, New York, N. Y.	V.	Chemist, American Cotton Oil Co.

1884.

CHARLES B. APPLETON . . 53 State St., Boston.	II.	With the Steel Cable Engineering Co.
HENRY F. BALDWIN . . . 164 Dearborn St., Chicago.	II.	Chief Engineer, Chicago & Eastern Illinois R. R.
FRED L. BARDWELL, B. S. . Boston, Mass.	V.	Instructor in General Chemistry, Mass. Institute of Technology.
T. HARRIS BARTLETT . . . Portland, Ore.	III.	Land Department, Northern Pacific R. R.
HENRY A. BOARDMAN . . Providence, R. I.	V.	With the Silver Spring Bleaching and Dyeing Co.
CHARLES C. BOTHFELD . . Detroit, Mich.	I.	Consulting Engineer on Iron and Steel Structures; Resident Manager, Pittsburgh Testing Laboratory.
W. FRANK CARR, B. S. . . 501 Wright Block, Minneapolis, Minn.	I.	Of Carr & Smith, Civil Engineers; Chief Engineer, Minneapolis Street Railway.
CHRISTOPHER J. CARVEN . 1604 Dorchester Ave., Dorchester, Mass.	I.	In City Engineer's Office, Boston, Mass.
ROSCOE L. CHASE . . . . 155 East Main St., North Adams, Mass.	V.	With the Arnold Print Works.
ALFRED O. DOANE . . . Newtonville, Mass.	III.	Assistant City Engineer, Newton, Mass.
ALFRED L. FITCH . . . . 96 and 98 West Lake St., Chicago, Ill.	II.	Secretary and Treasurer, American Architectural Iron and Brass Works.
GEORGE L. R. FRENCH . . Northampton, Mass.	I.	Division Roadmaster, Boston & Maine R. R.
AUGUSTUS H. GILL, Ph. D. . Boston, Mass.	V.	Instructor in Gas Analysis and Sanitary Chemistry, Mass. Institute of Technology.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
FRANK M. HAINES . . . Hotel Denmark, Boston.	III.	
GEORGE H. HEYWOOD . . Gardner, Mass.	III.	Of the Firm of Heywood Bros. & Co.
JAMES G. HOLDER, Ph. G. . 119 Broad St., Lynn, Mass.	V.	Apothecary.
G. FREDERICK KNAPP . . Lock Box 95, Sparrow's Point, Md.	V.	Assistant to President, Maryland Steel Co.
*AMY STANTIAL LUND . .	V.	Died Feb. 11, 1888.
CAPT. D. A. LYLE, U. S. A. P. O. Box 1606, Philadelphia.	III.	Inspector of Ordnance, U. S. A.
PHILIP S. MORSE, A. B. . Salt Lake City, Utah.	III.	With Germania Lead Works.
CHARLES O. PRESCOTT . . Milton, Mass.	V.	Teacher of Natural Science, Milton Academy
WILLIAM L. PUFFER . . . Boston, Mass.	III.	Instructor in Physics, Mass. Institute of Technology.
ARTHUR J. PURINTON . . 31 Harvard St., Brockton, Mass.	II.	Electrical Engineer, Brockton Street Ry.
WILLIAM J. RICH . . . Washington, D. C.	III.	Fourth Assistant Examiner, U. S. Patent Office.
FRANKLIN B. RICHARDS . Cleveland, Ohio.	III.	With M. A. Hanna & Co.
C. SNELLING ROBINSON . . Pueblo, Colo.	III.	Manager of Blast Furnaces, Colorado Fuel and Iron Co.
THEODORE W. ROBINSON . Pueblo, Colo.	III.	Superintendent, Colorado Fuel and Iron Co.
A. LAWRENCE ROTCH, A. M. 3 Commonwealth Ave., Boston, Mass.	II.	Proprietor, Blue Hill Meteorological Observatory, Readville, Mass.
JOSIAH P. RYDER . . . 44 Irving St., Watertown, Mass.	V.	Student Lingg System, Boston Normal School of Gymnastics.
ALFRED STEBBINS, JR. . . 915 Valencia St., San Francisco, Cal.	III.	Assistant Engineer, Southern Pacific R. R.
ELLIOT T. STURGIS . . . 125 Milk St., Boston, Mass.	III.	In Engineers' Department, New England Telephone and Telegraph Co.
ALICE BROWN TYLER . . Brookline, Mass.	V.	

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
HARRY W. TYLER, Ph. D. . Brookline, Mass.	V.	Associate Professor of Mathematics and Secretary, Mass. Institute of Technology.
NAHUM WARD . . . . Mt. Seaver Ave., Roxbury, Mass.	V.	Chemist, with N. Ward Co.
WILLIAM M. WHITNEY . . Winchendon, Mass.	II.	With Baxter D. Whitney, Manufacturer of Wood-working Machinery.
FRANCIS C. WILLIAMS, JR. . Joliet, Ill.	I.	Assistant Engineer, Elgin, Joliet & Eastern Ry.

1885.

CHARLES R. ALLEN . . . New Bedford, Mass.	V.	Teacher of Science, New Bedford High School.
DAVID BAKER . . . . . Sparrow's Pt., Md.	III.	Superintendent, Blast Furnace Department, Maryland Steel Co.
EDWARD R. BENTON, Ph. D. Boston, Mass.	IV.	Architect.
HEYWOOD COCHRAN . . . 930 West Main St., Louisville, Ky.	II.	Secretary and Treasurer of Ainslie, Cochran & Co.
EDWARD H. DEWSON, JR. . 125 Johnson St., Lynn, Mass.	II.	Constructive Engineer, Railway Department, General Electric Co.
FREDERICK FOX, JR., S.M., Ph.D. Boston, Mass.	V.	Analyst for State Board of Health of Massachusetts.
THOMAS W. FRY . . . . Claremont, N. H.	II.	Secretary and Superintendeut, Sullivan Machinery Co.
ROBERT R. GOODRICH . . Elkhorn, McDowell Co., W. Va.	III.	Mining Engineer.
WALTER K. HARRINGTON . Newport, R. I.	I.	
ELEAZER B. HOMER . . . Boston, Mass.	IV.	Assistant Professor of Architecture, Mass. Institute of Technology.
*FRANK H. LORD . . .	II.	Died Dec. 31, 1890.
TRACY LYON . . . . . Manhattan Bldg., St. Paul, Minn.	II.	Of the Firm of Robert Bement & Co., Engineers and Contractors.
HUGH MACRAE . . . . Wilmington, N. C.	III.	President, Linville Improvement Co., Linville, N. C.
HENRY MARTIN . . . . South Gardiner, Me.	V.	With Richards Paper Co.
ALLYNE L. MERRILL . . . Cambridge, Mass.	II.	Assistant Professor of Mechanism, Mass. Institute of Technology.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
*Eben G. Merrill	I.	Died Oct. 12, 1887.
Everett Morss, 297 Beacon St., Boston.	III.	With Morss & Whyte, Wire Workers.
Frederick H. Newell, Washington, D. C.	III.	Chief Hydrographer, U.S. Geological Survey.
Joseph E. Nute, 47 Durfee St., Fall River, Mass.	I.	Superintendent of Fall River Gas Co.
Marcella I. O'Grady, Poughkeepsie, N. Y.	IX.	Associate Professor of Biology, Vassar College.
Frank A. Pickernell, New York, N. Y.	VI.	With the American Telephone and Telegraph Co.
Richard H. Pierce, A. B. 320 Dearborn St., Chicago.	VI.	Of the "Electrical Engineering Co."
Newbert M. Randall, Sparrow's Point, Md.	III.	Chief Chemist, Maryland Steel Co.
Otis T. Stantial, 581 Diversey Ave., Chicago.	III.	Superintendent, Illinois Malleable Iron Co.
Henry P. Talbot, Ph. D. Boston, Mass.	V.	Assistant Professor of Analytical Chemistry, Mass. Institute of Technology.
George P. Vanier, Steelton, Pa.	III.	Chemist, Pennsylvania Steel Co.
Erastus Worthington, Jr. Dedham, Mass.	I.	Civil Engineer, Water Supply and Sewerage.

1886.

George P. Aborn, Warren, Mass.	II.	With the Knowles Pump Works.
Arthur C. Anthony, 93 Water St., Boston.	III.	Special Agent for the Queen Insurance Co. of America.
Dana P. Bartlett, Sutherland Road, Brighton, Mass.	VI.	Assistant Professor of Mathematics, Mass. Institute of Technology.
Birney C. Batcheller, 1518 N. Fifteenth St., Philadelphia, Pa.	II.	Engineer, Pneumatic Transit Co.
William L. Brainerd, 320 La Salle St., Chicago.	IV.	Architect of Firm of Brainerd & Packard.
John K. Burgess, Howland Falls, Me.	II.	With Howland Falls Pulp Co.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
CHARLES L. BURLINGHAM . Denver Athletic Club, Denver, Colo.	III.	General Agent for Colorado, U. S. Life Insurance Co.
WM. H. CHADBOURN, JR. . Newberne, N. C.	III.	United States Assistant Engineer, River and Harbor Improvements.
WILLIAM L. CHURCH . . 139 Adams St., Chicago, Ill.	VI.	General Superintendent, Chicago Edison Co.
HARRY E. CLIFFORD . . . Boston, Mass.	VI.	Instructor in Physics, Mass. Institute of Technology.
LOUIS R. COBB . . . . City Hall, Chicago, Ill.	I.	Assistant Engineer, Bureau of Streets.
FRANCIS H. CRANE . . . 18 P. O. Square, Boston.	VI.	Consulting Engineer, Emerson Power Scale Co.
LOUIS F. CUTTER . . . 16 Central St., Winchester, Mass.	I.	Transitman, Improved Sewerage, City of Boston.
CHARLES C. DOE . . . . South Newbury, Vt.	VII.	
ORRIN S. DOOLITTLE . . 148 North Fourth St., Reading, Pa.	V.	Chemist, Philadelphia & Reading R. R.
JAMES C. DUFF . . . . La Salle, Ill.	V.	Chemist, Matthiessen & Hegeler Zinc Co.
GEORGE W. FARMER . . . 915 Monroe St., Topeka, Kan.	II.	Draughtsman with Atchison, Topeka & Santa Fé R. R.
*EDWARD S. FOSS . . .	V.	Died Oct. 3, 1890.
FRED E. FOSS, A. M. . . Boston, Mass.	I.	Instructor in Highway Engineering, Mass. Institute of Technology.
THEODORE R. FOSTER . . Galesburg, Ill.	II.	Assistant to Master Mechanic, Galesburg Division, Chicago, Burlington & Quincy R. R.
ALEX. S. GARFIELD . . . Lynn, Mass.	II.	Engineer, Mining Department, General Electric Co.
D. LEWIS K. HATHAWAY . Warren, Mass.	II.	Draughtsman, Knowles Pump Works.
EDWARD E. HIGGINS . . 35 Wall St., New York.	VI.	Street Railway and Financial Expert.
WILLIAM J. HOPKINS . . Philadelphia, Pa.	VI.	Professor of Physics, Drexel Institute of Art, Science, and Industry.
WALTER RENTON INGALLS . P. O. Box 1833, New York, N. Y.	III.	Mining Engineer and Metallurgist.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
WILLIAM F. JORDAN . . . Rochester, N. Y.	I.	Assistant Engineer, Buffalo, Rochester & Pittsburgh R. R.
C. BELLE KENNEY . . . 111 Saratoga St., East Boston.	V.	Teacher of Chemistry, High School, Dedham, Mass.
JOHN A. McC. LAWRENCE . St. John, N. B.	II.	Manager, St. John Bolt and Nut Works.
ALBERT E. LEACH . . . 994 Washington St., Boston.	II.	Assistant Analyst, Mass. State Board of Health, Food and Drug Department.
FRANK L. LOCKE . . . . 36 Hancock St., Boston.	I.	In City Engineer's Office.
WILSON H. LOW . . . . Eighteenth and Blackwell Sts., Chicago, Ill.	V.	Chemical Director, with N. K. Fairbank & Co.
ELGOOD C. LUFKIN . . . Faurot Block, Lima, Ohio.	II.	Chief Engineer, Indiana Pipe Line Co.
JAMES P. LYNDE . . . . 37 and 39 Main St., Palmer, Mass.	IX.	Druggist.
ALEX. R. McKIM . . . . Jamaica Plain, Mass.	I.	Engineer, with Berlin Bridge Co., East Berlin, Conn.
HARRY B. MERRIAM . . . 216 East 4th St., Duluth, Minn.	I.	Chief Engineer, Duluth Transfer Ry.
HENRY P. MERRIAM . . . 11 Charlton St., New York.	VI.	With the Merriam Fuse Manufacturing Co.
EDWARD F. MILLER . . . Boston, Mass.	II.	Assistant Professor of Steam Engineering, Mass. Institute of Technology.
EDGAR H. MUMFORD . . 86 Liberty St., New York.	II.	With the Henry R. Worthington Co.
ARTHUR A. NOYES, S.M., Ph.D. Boston, Mass.	V.	Instructor in Organic Chemistry, Mass. Institute of Technology.
EDWARD L. PIERCE, JR. . Rumford Falls, Me.	II.	Mechanical Engineer.
*GEORGE F. REYNOLDS . .	II.	Died Jan. 19, 1891.
CHARLES F. RICHARDSON . 53 State St., Boston, Mass.	II.	Lawyer.
ARTHUR G. ROBBINS . . . Boston, Mass.	I.	Instructor in Civil Engineering, Mass. Institute of Technology.
L. KIMBALL RUSSELL . . Boston, Mass.	V.	Assistant in General Chemistry, Mass. Institute of Technology.
JOHN F. SEAVEY . . . . Ludlow, Mass.	II.	Mechanical Engineer, with Ludlow Manufacturing Co.
WILLIAM E. SHEPARD . . Lincoln, Neb.	VI.	Electrician and Superintendent, Lincoln Street Railway.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
JAMES E. SIMPSON . . . 163 Haverhill St., Lawrence, Mass.	III.	With J. R. Simpson & Co.
THEODORE STEBBINS . . . 620 Atlantic Ave., Boston.	VI.	Superintendent of Railway Construction, General Electric Co.
AUGUSTUS B. STOUGHTON . 914 Walnut St., Philadelphia.	II.	Attorney-at-Law, Patents and Patent Cases.
WILLIAM M. TAYLOR . . Indianapolis, Ind.	II.	Secretary of Chandler & Taylor Co.
CHARLES D. TURNBULL . 67 Chauncy St., Boston.	II.	In Treasurer's Office of the Cochrane Carpet Co.
DAVID VAN ALSTINE . . 33 Prytania St., New Orleans, La.	II.	General Foreman, Louisville & Nashville R. R.
MAURICE A. VIELÉ, B. S. . 476 West 152d St., New York, N. Y.	II.	Assistant Engineer, New Croton Aqueduct Commission.
C. MORRIS WILDER . . . Cincinnati, Ohio.	VI.	Electrical Engineer, Weir Frog Co.
ELWOOD J. WILSON . . Monterey, Mex.	III.	Superintendent, Compañia Minera Fundidora y Afinadora.
CHARLES WOOD . . . . 200 West Fourth St., Cincinnati, Ohio.	I.	Chief Engineer, Cincinnati, Hamilton & Dayton R. R.
CHARLES H. WOODBURY . Evans House, Tremont St., Boston, Mass.	II.	Artist.
VERNOR F. WORCESTER . . 36 Pine St., Rutland, Vt.	II.	Draughtsman, Howe Scale Co.
FRED R. YOUNG . . . . 157 Summer St., Boston.	III.	In Business.

1887.

GEORGE A. ARMINGTON . . 1 Woodward Pl., Cleveland, Ohio.	II.	Engineer of Construction, Otis Steel Co.
SIDNEY R. BARTLETT, D.M.D., 2 Commonwealth Ave., Boston, Mass.	VII.	Dentist.
CHARLES A. BARTON . . West Dale St., Waltham, Mass.	II.	With Waltham Bleaching and Dye Works.
WILLIAM B. BLAKE . . . Fourteenth and Main Sts., Louisville, Ky.	I.	Assistant Engineer, Maintenance of Way, Louisville Division, Pittsburgh, Cincinnati, Chicago & St. Louis Ry.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
WALTER C. BRACE . . . Rico, Dolores Co., Colo.	III.	Manager, Rico Ore Market.
DWIGHT BRAINERD . . . 103 St. François Xavier, Montreal, Que.	IX.	Treasurer, Hamilton Powder Co.
HENRY B. BRAINERD . . 103 St. François Xavier, Montreal, Que.	IX.	With Dominion Cartridge Co.
HENRY F. BRYANT . . . Town Hall, Brookline, Mass.	I.	With A. H. French, Civil Engineer.
FRANK G. BURGESS . . . 222 Sutter St., San Francisco, Cal.	I.	Instructor in Topographical Drawing and Mapping, University of California.
JULIAN A. CAMERON . . . Graniteville, Mass.	II.	With Abbot Worsted Mills.
FRANK D. CARNEY . . . Steelton, Pa.	III.	With Pennsylvania Steel Co.
WINTHROP COLE . . . . 422 Richmond St., Philadelphia, Pa.	II.	With The Wm. Cramp & Sons Ship and Engine Building Co.
HENRY J. CONANT . . . 620 Atlantic Ave., Boston.	II.	With Westinghouse, Church, Kerr & Co., Boston Office.
HELEN COOLEY . . . . 116 W. 59th St., New York.	V.	Head of Scientific Department, Dr. Sach's School for Girls; Student in Chemistry, College of Pharmacy.
RALPH E. CURTIS . . . Portland, Me.	II.	Draughtsman with Portland Co.
WILLIAM C. CUSHING, M. A. Indianapolis, Ind.	I.	Engineer, Maintenance of Way, Pittsburgh, Cincinnati, Chicago & St. Louis Ry., Indianapolis Division.
SARAH L. DAY, A. B. . . 280 Newbury St., Boston.	V.	Water Analyst, State Board of Health.
WALTER C. FISH . . . . Lynn, Mass.	VI.	Assistant to the Technical Director, General Electric Co.
JOHN M. FOX . . . . . 73 Union St., Portland, Me.	VI.	Electrical Engineer and Contractor.
JOSEPH B. GAY . . . . 114 Huntington Ave., Boston.	IV.	Travelling in Europe.
WALTER H. GLEASON . . 12 Faneuil Hall Market, Boston, Mass.	V.	With W. Gleason & Co., Fruit Commission Merchants.
WILLIAM S. HADAWAY, JR. 8 Dover St., Cambridge, Mass.	VIII.	Superintendent, Germania Electric Co.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
WILLIAM O. HILDRETH . Lawrence, Mass.	II.	With Stanley Manufacturing Co.
JAMES C. HOBART . . . 217 West Second St., Cincinnati, Ohio.	II.	Secretary of the Triumph Compound Engine Co.
OREN S. HUSSEY . . . . 24 Kneeland St., Boston.	II.	Of the Firm of Bailey & Hussey.
EDWARD A. JONES . . . Pittsfield, Mass.	II.	With E. D. Jones, Sons & Co., Paper Mill Architects and Manufacturers of Paper Machinery.
CHARLES B. KENDALL . . Passaic, N. J.	V.	Assistant Superintendent, Passaic Print Works.
WILLIAM D. LIVERMORE . 45 Soley St., Charlestown, Mass.	V.	Chemist, Washington Mills, Lawrence, Mass.
PHILIP A. MOSMAN . . . Delta Shoshone Co., Idaho.	III.	With Beaver Gold Mining Co.
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ARTHUR J. OBER . . . . Somerville, Mass.	I.	Assistant in City Engineer's Department.
HAMILTON OTIS . . . . Cazadero, Sonoma Co., Cal.	I.	Rancher.
NICOLAS T. PARASCHOS . . Constantinople, Turkey.	I.	Civil Engineer.
CHARLES F. PARK . . . . Boston, Mass.	II.	Assistant in Mechanical Engineering, Mass. Institute of Technology.
J. SCOTT PARRISH . . . . Richmond, Va.	II.	Acting Treasurer, Richmond Cedar Works; Secretary, Gulf Red Cedar Co.
FRANK E. PERKINS . . . Boulevard d'Inkermann, 29 Neuilly, Paris, France.	IV.	Student.
JOHN C. PERRY . . . . . 1000 Cass St., Joliet, Ill.	II.	With the Bates Machine Co.
HENRY M. PHILLIPS . . . 719 E. 4th St., So. Boston, Mass.	VI.	With Bernstein Electric Co.
ARTHUR G. PIERCE. . . . 26 Bremen St., E. Boston, Mass.	VI.	With the Edison Electric Illuminating Co., Boston.
ARTHUR W. PIERCE . . . 402 West Munroe St., hicago, Ill.	VI.	With Western Electric Co.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
MACY S. POPE . . . . . Boston, Mass.	I.	Assistant in Civil Engineering, Mass. Institute of Technology.
DANA M. PRATT . . . . Indianapolis, Ind.	I.	Assistant, Maintenance of Way Department, Cleveland, Cincinnati, Chicago & St. Louis Ry.
ARTHUR G. RANLETT . . . Newton Copper Mine, Amador Co., Cal.	III.	Superintendent of Newton Copper Mine.
FREDERICK L. RHODES . . 42 Farnsworth St., So. Boston, Mass.	VI.	Electrician with American Bell Telephone Co.
ANDREW R. ROBERTSON . . 8 Park Circus Pl., Glasgow, Scotland.	II.	
DWIGHT P. ROBINSON, A. B. Boston, Mass.	VI.	Assistant in Mechanical Engineering, Mass. Institute of Technology.
WILLIAM M. ROSEWATER . 221 Perry St., Cleveland, O.	II.	Draughtsman, Otis Steel Co.
GEORGE F. ROWELL . . . 14 Beacon St., Boston.	I.	With the Sewer Department.
HORACE F. RUGGLES . . . Cienfuegos, Island of Cuba.	II.	Assistant Superintendent of Sugar Refinery, Soledad Plantation.
WARD M. SACKETT, C. E. . 3939 Langley Ave., Chicago, Ill.	VI.	Electrical Department, World's Columbian Exposition.
HENRY J. SAGE, B. A. . . 100 Federal St., Boston.	VI.	With Sage & Co.
OSCAR F. SAGER. . . . . Bristol, R. I.	II.	With the Herreshoff Mfg. Co.
ALBERT F. SARGENT, JR. . . 425 Main St., Malden, Mass.	I.	With A. F. Sargent, Civil Engineer, Surveyor and Conveyancer.
ROBERT T. SAUNDERS . . . East Cambridge, Mass.	I.	With Boston Bridge Works.
RUSSELL SELFRIDGE . . . 221 Columbus Ave., Boston.	IX.	With Pope Mfg. Co.
FRANK C. SHEPHERD . . . 18 Yarmouth St., Boston.	XI.	Transit-man, with Metropolitan Sewerage Commission.
LE ROY K. SHERMAN . . . Indianapolis, Ind.	I.	Assistant on Engineering Corps, Pittsburgh, Cincinnati, Chicago & St. Louis Ry.
HARRY D. SHUTE . . . . Boston, Mass.	VI.	Studying abroad.
THEODORE H. SKINNER . . Cottage St., Wellesley, Mass.	IV.	Architect.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
ARTHUR C. SMITH . . . . Boston, Mass.	V.	Chemist, Bradley Fertilizer Works.
HENRY P. SPAULDING . . . Newton, Mass.	VI.	
RALPH H. SWEETSER . . . Sparrow's Point, Md.	III.	With Maryland Steel Co., Blast Furnace Department.
GEORGE P. TALLANT . . . 1001 Bush St., San Francisco, Cal.	IX.	
ROBERT R. TAYLOR . . . . Tuskegee, Ala.	IV.	Teacher, Tuskegee Normal and Industrial School.
WILLIAM C. THALHEIMER . 146 Franklin St., Boston.	I.	With E. S. Shaw, Consulting and Bridge Engineer.
WALTER B. TROWBRIDGE . . Boston, Mass.	II.	Assistant in Mechanical Drawing, Mass. Institute of Technology.
GEORGE W. VAILLANT . . . Lynn, Mass.	III.	With the Thomson-Houston Electric Co.
JOHN F. VINING . . . . . Mason Building, Boston.	IV.	Draughtsman with J. Williams Beal, Architect.
THOMAS C. WALES . . . . 125 Milk St., Boston.	VI.	With American Bell Telephone Co.
FRANCIS WALKER . . . . New York, N. Y.	IX.	Fellow School of Political Science, Columbia College.
CHARLES F. WALLACE . . . New York, N. Y.	VI.	With H. Ward Leonard Co., Electrical Engineer.
MURRAY WARNER . . . . Worcester, Mass.	II.	With Wheelock Engine Co.
JOSEPH A. WARREN . . . Cumberland Mills, Me.	XI.	With S. D. Warren & Co.
CHARLES C. WATERMAN . . 18 Cortlandt St., New York.	VI.	With American Telephone & Telegraph Co.
RICHARD WATERMAN, JR. . Chicago, Ill.	II.	Student at the University of Chicago.
HENRY S. WEBB . . . . . 23 Front St., Schenectady, N. Y.	VI.	With the Edison General Electric Co.
EDWARD C. WELLS . . . . Boston, Mass.	II.	Assistant in Mechanical Engineering, Mass. Institute of Technology.
GEORGE V. WENDELL . . . Boston, Mass.	VIII.	Assistant in Physics, Mass. Institute of Technology.
FRANK P. WESTCOTT, Ph. D. Boston, Mass.	I.	With Boston Board of Survey.
ARTHUR M. WORTHINGTON . Lawrence, Mass.	VII.	Assistant Bacteriologist, State Board of Health of Massachusetts.

Alumni will confer a favor by informing the Secretary of the Faculty of any change of address or occupation.

Other persons who have been connected with the Institute for one year or more will also confer a favor by informing the Secretary of the Faculty of their address and occupation.

SUMMARY.

Class of 1868	14	Class of 1881	28
" " 1869	5	" " 1882	24
" " 1870	10	" " 1883	19
" " 1871	17	" " 1884	36
" " 1872	12	" " 1885	27
" " 1873	26	" " 1886	59
" " 1874	18	" " 1887	58
" " 1875	27	" " 1888	77
" " 1876	43	" " 1889	75
" " 1877	32	" " 1890	102
" " 1878	19	" " 1891	102
" " 1879	23	" " 1892	132
" " 1880	8		

Total	993
Deduct names counted twice	4
	989

ALPHABETICAL LIST OF GRADUATES.

NAME.	COURSE.	CLASS.
Abbott, Ira	I.	1881
Aborn, George P.	II.	1886
Adams, Arthur H.	II.	1890
Aiken, Charles W.	II.	1891
Alden, Charles H., Jr.	IV.	1890
Alden, John	V.	1877
Albright, William B.	V.	1878
Allen, Charles F.	III.	1876
Allen, C. Frank	I.	1872
Allen, Charles R.	V.	1885
Allen, John H.	III.	1881
Allen, Samuel E.	I.	1875
Allen, Walter S.	V.	1879
Ames, Clara P.	V.	1882
Anthony, Arthur C.	III.	1886
Appleton, Charles B.	II.	1884
Appleton, Ellery C.	III.	1868
Armington, George A.	II.	1887
Arnott, James L.	Sci. and Lit.	1875
Aspinwall, Thomas	I.	1876
Atkinson, James S.	II.	1881
Atwood, Frank W.	V.	1890
Atwood, William P.	V.	1876
Austin, Amory	V.	1873
Ayer, Arthur W.	II.	1890
Babb, Cyrus C.	I.	1890
Bachelder, Charles S.	V.	1877
Baker, Charles M.	IV.	1878
Baker, David	III.	1885
Baker, Joseph B.	VI.	1890
Baker, William H.	I.	1869
Baldwin, Henry F.	II.	1884
Baldwin, Hiram E.	I.	1890
Baldwin, Thomas W.	I.	1876
Ball, Robert S.	II.	1891
Bardwell, Fred L.	V.	1884
Bardwell, Herbert T.	I.	1883
Barri, Joel G.	I.	1891
Barrows, Herbert	I.	1874
Barrows, Walter B.	VII.	1876
Barrus, George H.	II.	1874
Bartlett, Dana P.	VI.	1886
Bartlett, Sidney R.	VII.	1887
Bartlett, Spaulding	V.	1890
Bartlett, T. Harris	III.	1884
Bartol, George	III.	1877
Barton, Charles A.	II.	1887
Barton, George H.	III.	1880
Basford, George M.	II.	1889
Bassett, William H.	V.	1891
Batchelder, John L.	VII.	1890
Batcheller, Birney C.	II.	1886
Bates, Henry D.	IV.	1888
Beach, Edward J.	V.	1889
Beal, Charles A.	VI.	1892
Beal, Foster E. L.	I.	1871
Beal, J. Williams	IV.	1877
Beasom, Charles B.	II.	1890
Beckler, Alice H.	VII.	1892
Beeching, William H.	II.	1877
Bellows, Arthur B.	II.	1889
Benton, Edward R.	IV.	1885
Bickford, Elizabeth E.	VII.	1890
Bigelow, Charles H.	VI.	1892
Bigelow, Henry F.	IV.	1888
Binney, Amos	V.	1881
Bird, Adelaide	VII.	1891
Bird, Herbert S.	V.	1888
Birks, John H.	II.	1891
Bissell, David S.	III.	1881
Bixby, Willard G.	II.	1889
Blackwell, Ethel B.	VII.	1891

NAME.	COURSE.	CLASS.
Blake, William B.	I.	1887
Blanchard, Frederick C.	II.	1891
Blanchard, Winslow	II.	1888
Bliss, Zenas W.	II.	1889
Blodgett, Aaron D.	II.	1876
Blodgett, George W.	I.	1873
Blood, John B.	VI.	1890
Blunt, William T.	I.	1874
Boardman, Henry A.	V.	1884
Bolan, Thomas V.	VI.	1891
Borden, Charles N.	II.	1889
Boss, Austin D.	II.	1890
Bothfeld, Charles C.	I.	1884
Bourne, Phillips P.	II.	1892
Bowen, Stephen	II.	1892
Boyden, Amos J.	IV.	1875
Brace, Walter C.	III.	1887
Bradlee, Arthur T.	II.	1888
Bradlee, Henry G.	VI.	1891
Bradley, Frederick W.	VI.	1889
Bradley, Harry C.	I.	1891
Bragg, Edward F.	II.	1890
Bragg, Lottie A.	V.	1890
Brainerd, Dwight	IX.	1887
Brainerd, Frederick H.	III.	1889
Brainerd, Henry B.	IX.	1887
Brainerd, Wallace H.	VI.	1891
Brainerd, William L.	IV.	1886
Braley, Samuel T.	II.	1879
Brand, Horace L.	II.	1891
Breed, Joshua B. F.	I.	1876
Brewster, Benjamin E.	III.	1872
Bridges, Luther W.	II.	1889
Briggs, Frank H.	IX.	1881
Brotherton, William E.	V.	1873
Brown, Bertha M.	VII.	1892
Brown, Charles H.	I.	1880
Brown, Edward D.	VI.	1890
Brownell, Ernest H.	I.	1890
Bryant, Dixie L.	XII.	1891
Bryant, George H.	II.	1883
Bryant, Henry F.	I.	1887
Bryant, William P.	X.	1891
Bryden, George W.	II.	1891
Bulkley, Joseph N.	VI.	1889
Burbank, Philip M.	VI.	1892
Burgess, Frank G.	I.	1887
Burgess, John K.	II.	1886
Burlingham, Charles L.	III.	1886
Burnet, Moses D.	III.	1875
Burnham, Charles M.	VI.	1892
Burnham, Edward C.	II.	1890
Burnham, Guy J.	X.	1892
Burnham, Harry A.	II.	1892
Burrage, Severance	VII.	1892
Burrison, Henry K.	I.	1875
Burton, Frank H.	II.	1891
Buttolph, Benjamin G.	II.	1888
Buttolph, Harry T.	I.	1876
Cabot, John W.	III.	1879
Calkins, Gary N.	IX.	1890
Came, Frank E.	I.	1881
Cameron, Julian A.	II.	1887
Campbell, George A.	I.	1891
Campbell, Harry H.	III.	1879
Capen, Barnard J.	VI.	1891
Capen, G. Walter	IV.	1877
Card, Huber D.	XII.	1892
Carleton, Elbridge S.	IV.	1888
Carlisle, Morten	VI.	1890
Carlton, Chester V.	I.	1890
Carney, Frank D.	III.	1887
Carney, James A.	V.	1890
Carr, W. Frank	I.	1884
Carson, Howard A.	I.	1869
Carson, Thomas B.	II.	1882
Carter, Henry H.	I.	1877
Carven, Christopher J.	I.	1884
Cater, Douglas A.	II.	1892
Center, David A.	VI.	1888
Chadbourn, William H., Jr.	III.	1886
Chamberlin, William E.	IV.	1877
Chapman, George D.	II.	1890
Chapman, George H.	II.	1877
Chase, Charles H.	VI.	1892
Chase, Edwin E.	I.	1880
Chase, Frank D.	III.	1881
Chase, Frank L.	I.	1890

NAME.	COURSE.	CLASS.
Chase, Harvey S.	II.	1883
Chase, Richard D.	XI.	1892
Chase, Roscoe L.	V.	1884
Child, Stephen	I.	1888
Childs, Edward L.	II.	1891
Church, Albert K.	V.	1892
Church, Christopher A.	I.	1875
Church, William L.	VI.	1886
Cilley, Frank H.	I.	1889
Claflin, George E.	VI.	1888
Clark, Edward K.	II.	1870
Clark, Frederick W.	III.	1880
Clark, James, Jr.	VI.	1890
Clement, Hugh B.	IV.	1891
Clifford, Harry E.	VI.	1886
Clough, Albert L.	VI.	1891
Cobb, Louis R.	I.	1886
Cobb, Sylvanus H.	VI.	1888
Cochran, Heywood	II.	1885
Cody, Lewis P.	VI.	1892
Coffin, Fred S.	III.	1879
Cogswell, Charles P., Jr.	I.	1892
Colby, John M., Jr.	II.	1892
Colby, Russell H.	V.	1888
Cole, Fred A.	II.	1891
Cole, Fred B.	II.	1888
Cole, Harrison I.	II.	1891
Cole, Winthrop	II.	1887
Collins, Benjamin G.	II.	1881
Collins, Bertrand R. T.	II.	1888
Collins, Edward, Jr.	VI.	1888
Collins, Reuben B.	I.	1891
Collins, William H.	V.	1890
Conant, Henry J.	II.	1887
Conant, Roger W.	VI.	1891
Conant, Whitney	III.	1868
Conner, Arthur J.	V.	1888
Connor, Addison	I.	1871
Cook, Walter F.	IX.	1890
Cooley, Helen	V.	1887
Copeland, Frederick K.	I.	1876
Crabtree, Fred	V.	1889
Craigin, Henry A.	II.	1889
Crane, Francis H.	VI.	1886
Crane, John	I.	1890
Crane, Joshua, Jr.	VI.	1892
Cromwell, Charles H.	II.	1889
Crosby, William O.	VII.	1876
Cross, Charles R.	Sci. and Lit.	1870
Cunningham, Edward	X.	1891
Curtin, John A.	I.	1892
Curtis, Ralph E.	II.	1887
Curtis, Russell H.	I.	1870
Cushing, William C.	I.	1887
Cutler, Harry H.	II.	1881
Cutler, Henry M.	I.	1871
Cutter, Louis F.	I.	1886
Cutter, Roland N.	I.	1889
Dadmun, George E.	II.	1892
Daggett, Herbert C.	I.	1891
Dame, Frank L.	VI.	1889
Dan, Takuma	III.	1878
Dana, Gorham	I.	1892
Darlington, F. Graef	IX.	1881
Davenport, William S.	V.	1889
Davis, Arthur L.	II.	1889
Davis, Frank E.	II.	1883
Davis, Willis E.	Sci. and Lit.	1876
Day, Sarah L.	V.	1887
de Carvalho, Raul R.	IX.	1892
de Lancey, Darragh	II.	1890
Delano, Alexander J.	I.	1890
Dennett, Clarence L.	II.	1876
Dennett, William H.	IV.	1892
Derr, Louis	VI.	1892
Devens, Richard	II.	1888
De Wolf, John O.	II.	1890
Dewson, Edward H., Jr.	II.	1885
Dill, Howard A.	I.	1891
Doane, Alfred O.	III.	1884
Doane, George E.	I.	1874
Dodd, Margaret E.	VII.	1892
Dodge, Charles B.	IX.	1889
Dodge, Frederick H.	II.	1890
Dodge, Frank S.	I.	1875
Dodge, William B.	I.	1872
Doe, Charles C.	VII.	1886
Donn, Edward W., Jr.	IV.	1891

NAME.	COURSE.	CLASS.
Doolittle, Orrin S.	V.	1886
Dorr, Edgar S.	I.	1875
Dorr, Frank H.	VI.	1891
Douglass, Walter B.	I.	1892
Dowse, William B.	IV.	1874
Dresser, Henry C.	II.	1892
du Bois, Barron P.	VI.	1892
Duff, James C.	V.	1886
Duff, John	V.	1881
Dunbar, Francis W.	VI.	1890
Dunbar, W. Otis	II.	1879
Dunham, Lewis A.	I.	1891
du Pont, Pierre S.	V.	1890
Durfee, Nathan	II.	1889
Dutton, Edgar F.	VI.	1888
Dwelley, Edwin F.	I.	1890
Dyar, Harrison G.	V.	1889
Eastman, Henry F.	II.	1888
Eaton, Charles S.	IV.	1878
Edes, William C.	I.	1875
Edmands, J. Rayner	II.	1869
Edwards, Arthur V.	IV.	1889
Eldridge, George F.	V.	1892
Ellsworth, Alfred B.	I.	1888
Ely, Edward F.	IV.	1882
Ely, Sumner B.	II.	1892
Emerson, Joseph S.	I.	1874
Emery, Elwood A.	IV.	1890
Emmerton, Frederic A.	V.	1872
England, Paul W.	VI.	1891
Ensworth, Horace H.	VI.	1891
Eppendorff, John G.	IV.	1883
Eppes, Richard, Jr.	II.	1888
Fabens, George W.	I.	1879
Fabens, Samuel A., Jr.	I.	1873
Farmer, George W.	II.	1886
Faunce, Elmer	III.	1871
Faunce, George	III.	1882
Faunce, Linus	II.	1877
Favor, George W.	III.	1891
Feland, Logan	IV.	1892
Felton, Samuel M.	I.	1873
Fenn, William H.	I.	1890
Ferguson, Louis A.	VI.	1888
Firth, Frank R.	I.	1868
Fish, Walter C.	VI.	1887
Fisher, Charles H.	II.	1877
Fisher, Frederick L.	I.	1873
Fiske, Henry A.	X.	1891
Fiske, Jonathan P. B.	VI.	1889
Fitch, Alfred L.	II.	1884
Fletcher, Charles R.	V.	1876
Flint, Bertram P.	II.	1888
Flint, William C.	III.	1877
Flint, William P.	II.	1890
Flood, Samuel D.	II.	1890
Foote, Edward H.	I.	1871
Foque, Theodore A.	II.	1888
Foran, George J.	II.	1883
Forbes, Eli	Sci. and Lit.	1868
Forbes, Howard C.	X.	1891
Forbush, Gayle T.	X.	1892
Foss, Edward S.	V.	1886
Foss, Fred E.	I.	1886
Foss, Harry A.	II.	1882
Foster, Theodore R.	II.	1886
Fox, Frederick, Jr.	V.	1885
Fox, John M.	VI.	1887
Francis, Frederick L.	IV.	1892
Freeman, John R.	I.	1876
French, Alfred W.	I.	1889
French, Allen	IX.	1892
French, Charles A.	III.	1882
French, Edward R.	VI.	1892
French, Edward V.	I.	1889
French, George L. R.	I.	1884
French, Hollis	VI.	1889
French, Lester G.	II.	1891
Frost, Howard V.	V.	1882
Fry, Thomas W.	II.	1885
Fukuzawa, Stejiro	I.	1888
Füger, Frederic W.	II.	1891
Fuller, Charles E.	II.	1892
Fuller, Frank L.	I.	1871
Fuller, Geo. W.	V.	1890
Fuller, James E., Jr.	IV.	1888
Fuller, William B.	I.	1883
Furber, Pierce P.	IV.	1877

NAME.	COURSE.	CLASS.
Gale, Horace B.	II.	1883
Galloupe, Francis E.	II.	1876
Gannett, Earl W.	VI.	1889
Gardiner, Edward G.	VII.	1882
Garfield, Alexander S.	II.	1886
Garrison, Charles	VI.	1891
Gay, Joseph B.	IV.	1887
Gay, Martin	I.	1877
Gerrish, William H.	II.	1888
Gilbert, James P.	V.	1889
Gill, Augustus H.	V.	1884
Gill, Edward P.	IV.	1892
Gilman, Charles C.	III.	1868
Gilmore, Geo. L.	II.	1890
Gilmore, Howard	II.	1892
Gleason, Walter H.	V.	1887
Glidden, John W.	II.	1890
Goddard, David S.	III.	1881
Goodale, Charles W.	III.	1875
Goodell, George H.	II.	1892
Gooding, Charles S.	II.	1879
Goodrich, Robert R.	III.	1885
Goodwin, Harry M.	VIII.	1890
Gould, Robert H.	Metallurgy.	1876
Gray, Joseph P.	I.	1877
Gray, William P.	VI.	1892
Green, William W.	I.	1892
Greene, Charles E.	I.	1868
Greene, Irving G.	I.	1888
Greenlaw, Frank M.	VI.	1890
Greer, Medorem W.	VI.	1891
Grimes, Charles B.	V.	1892
Gross, Harold G.	VII.	1888
Grover, Edmund	I.	1877
Guild, Frederick, Jr.,	Sci. and Lit.	1873
Guppy, Benjamin W.	I.	1889
Gustin, George H.	III.	1883
Hadaway, William S., Jr.	VIII.	1887
Haines, Frank M.	III.	1884
Hale, George E.	VIII.	1890
Hale, Richard A.	I.	1877
Hall, Albert F.	II.	1868
Hall, Edward C., Jr.	II.	1892
Hall, Francis P.	V.	1882
Hall, John R.	VI.	1890
Hamblet, George W.	II.	1888
Hamilton, Edgar L.	III.	1891
Hamilton, George W.	I.	1880
Hammatt, Edward A. W.	I.	1875
Hammett, Philip M.	II.	1890
Hammond, Charles F.	I.	1891
Handy, Edward A.	I.	1875
Hardman, John E.	III.	1877
Harriman, Frederic O.	I.	1883
Harrington, Walter K.	I.	1885
Harris, W. Dale	I.	1873
Harris, Willlam L.	VII.	1888
Hartwell, Ernest G.	IV.	1879
Harvey, George L.	II.	1888
Harwood, Harry A.	I.	1892
Haskins, William	III.	1891
Hastings, Charles F.	III.	1888
Hatch, Arthur E.	I.	1891
Hathaway, D. Lewis K.	II.	1886
Hathaway, Herbert E.	V.	1891
Hathaway, Savory C., Jr.	VI.	1888
Hayden, Charles	IX.	1890
Hayden, Sophia G.	IV.	1890
Hayes, Frank	II.	1890
Hayes, Harry E.	VI.	1890
Hazard, Schuyler	I.	1890
Head, James H.	II.	1875
Heath, George L	V.	1888
Heins, George L.	IV.	1882
Henck, John B., Jr.	VIII.	1876
Herrick, Edward W.	II.	1888
Herrick, James A.	V.	1872
Hersam, Ernest A.	V.	1891
Heywood, Albert S.	VI.	1892
Heywood, George H.	III.	1884
Heywood, Lincoln C.	I.	1891
Hibbard, Henry D.	III.	1877
Hibbard, Thomas	II.	1875
Higgins, Alfred S.	IV.	1878
Higgins, Edward E.	VI.	1886
Hildreth, William O.	II.	1887
Hilliard, John D., Jr.	VI.	1892
Hinman, Charles W.	III.	1870

NAME.	COURSE.	CLASS.
Hobart, Henry M.	VI.	1889
Hobart, James C.	II.	1887
Hobbs, Franklin W.	II.	1889
Hodgdon, Frank W.	I.	1876
Hodge, James M.	III.	1872
Holbrook, Elliot	I.	1874
Holder, James G.	V.	1884
Hollingsworth, Sumner	II.	1876
Hollis, Frederick S.	V.	1890
Holman, George U. G.	VI.	1889
Holman, Marie G.	V.	1881
Holman, Silas W.	VIII.	1879
Holmes, Francis C.	IX.	1892
Holmes, George A.	X.	1891
Holton, Edward C.	V.	1888
Homer, Eleazer B.	IV.	1885
Hongma, Aechirau	I.	1874
Hooker, Richard	IV.	1889
Hopkins, Frederick L.	V.	1889
Hopkins, Prescott A.	IV.	1892
Hopkins, William J.	VI.	1886
Hopton, Walter E.	II.	1891
Horn, Henry J., Jr.	I.	1888
Horton, Sidney E.	II.	1890
Hosea, Raphael M.	I.	1879
Howard, Charles P.	I.	1874
Howe, Henry M.	III.	1871
Howe, Horace J.	I.	1879
Howes, Clarence L.	II.	1873
Howland, Albert H.	I.	1871
Hoxie, Frederick J.	VI.	1892
Hoyt, William E.	I.	1868
Hunt, Alfred E.	III.	1876
Hunt, Harry H.	VI.	1889
Huntington, William F.	I.	1875
Hussey, Oren S.	II.	1887
Hutchings, James H.	II.	1883
Hutchins, Edward S.	II.	1889
Hutchinson, William S.	III.	1892
Ingalls, Walter R.	III.	1886
Ingraham, George H.	IV.	1892
Jackson, Frank H.	III.	1874
Jacobs, Arthur L.	VI.	1892
Jacques, William W.	VIII.	1876
James, Frank M.	II.	1888
James, Samuel, Jr.	III.	1876
Jenkins, Charles D.	V.	1882
Jenney, Walter	III.	1877
Jewett, William P.	I.	1873
Johnson, James W.	I.	1882
Johnson, Jesse F.	X.	1892
Johnson, Lewis E.	II.	1889
Johnson, William S.	I.	1889
Johnston, William A.	II.	1892
Jones, Arthur W.	VI.	1888
Jones, Edward A.	II.	1887
Jordan, Edwin O.	VII.	1888
Jordan, Harry W.	V.	1891
Jordan, William F	I.	1886
Kales, William R.	II.	1892
Kauffman, Milton H.	V.	1891
Kebler, Julian A.	I.	1878
Keene, Thomas M.	I.	1891
Kendall, Charles B.	V.	1887
Kendall, Francis H.	I.	1890
Kendall, William R.	VI.	1892
Kenney, C. Belle	V.	1886
Kennicott, Harry A.	I.	1890
Keough, William T.	II.	1888
Kilham, Alfred C.	II.	1876
Kilham, Walter H.	IV.	1889
Kimball, Herbert S.	X.	1891
Kimball, William A.	II.	1873
Kinnicutt, Leonard P.	V.	1875
Kinsman, Arthur D.	VIII.	1889
Kirk, Joseph	II.	1877
Kittredge, George W.	I.	1877
Knapp, Frederick B.	I.	1879
Knapp, George F.	V.	1884
Knapp, J. Austin	II.	1876
Knight, Franklin	I.	1890
Knowles, Morris, 2d	I.	1891
Koch, Armand D.	IV.	1892
Koehler, Walter J.	V.	1881
Kunhardt, Lewis H.	II.	1889
Lane, Fred H.	II.	1879
Lane, William H.	VI.	1892
Lauder, George B.	VI.	1889

NAME.	COURSE.	CLASS.
Lawrence, John A. McC.	II.	1886
Lawrence, William H.	IV.	1891
Laws, Frank A.	VI.	1889
Lawton, Charles F.	I.	1877
Leach, Albert E.	II.	1886
Lee, Elisha, Jr.	I.	1892
Lee, George S.	I.	1888
Leeming, Woodruff	IV.	1891
Leland, William E.	II.	1891
Lenfest, Bertram A.	II.	1890
Leonard, H. Ward	III.	1883
Le Sueur, Ernest A.	VI.	1890
Lewis, Edwin J., Jr.	IV.	1881
Lewis, Theodore J.	II.	1876
Lewis, Wilfred	II.	1875
Lewis, William W.	II.	1889
Lincoln, G. Russell	III.	1871
Lindsay, William B.	V.	1881
Linzee, John W., Jr.	I.	1889
Livermore, William D.	V.	1887
Locke, Bradford H.	III.	1872
Locke, Frank L.	I.	1886
Locke, William W.	XI.	1892
Lord, Frank H.	II.	1885
Loring, Fred R.	VII.	1879
Loring, Harrison, Jr.	II.	1889
Loveland, James W.	V.	1888
Low, Albert H.	V.	1876
Low, John F.	V.	1882
Low, Wilson H.	V.	1886
Lufkin, Elgood C.	II.	1886
Lukes, Joseph B.	VI.	1892
Lund, Amy Stantial	V.	1884
Lund, James.	V.	1881
Lyle, David A.	III.	1884
Lynde, James P.	IX.	1886
Lyon, Joseph P.	I.	1892
Lyon, Tracy	II.	1885
Macfarlane, William W.	V.	1879
MacRae, Hugh	III.	1885
Main, Charles T.	II.	1876
Maltby, Margaret E.	VIII.	1891
Manahan, Elmer G.	XI.	1892
Manley, Laurence B.	I.	1892
Mann, Arthur S.	II.	1888
Mann, Bertram H.	VI.	1890
Manning, Harry G.	II.	1882
Mansfield, Arthur N.	VIII.	1891
Mansfield, George W.	III.	1882
Mansfield, Harvey M.	III.	1883
Mansfield, Richard H., Jr.	VI.	1892
March, Clement	I.	1891
Marquand, Philip	I.	1891
Martin, Henry	V.	1885
Mason, Sampson D.	I.	1870
Mathews, Albert P.	VII.	1892
May, George H.	V.	1892
May, William C.	V.	1873
McCaw, Wallace E.	VI.	1892
McConnell, George B.	I.	1890
McKenna, Alexander G.	V.	1891
McKim, Alexander R.	I.	1886
McLauthlin, George V.	V.	1888
Merrell, Charles G.	V.	1888
Merriam, Harry B.	I.	1886
Merriam, Henry P.	VI.	1886
Merrick, George E.	V.	1890
Merrill, Allyne L.	II.	1885
Merrill, Eben G.	I.	1885
Merrill, George A.	XI.	1892
Merrill, N. Frederick	V.	1870
Messenger, William H.	II.	1892
Metcalf, Arthur H.	II.	1879
Metcalf, Frederick	II.	1890
Metcalf, Leonard	I.	1892
Meyer, Joseph A., Jr.	IV.	1891
Mildram, Samuel H.	I.	1889
Millen, Loring R.	III.	1880
Miller, Edward F.	II.	1886
Miller, Edwin C.	II.	1879
Miller, Herbert S.	VI.	1892
Miller, Lilly	V.	1892
Miller, William T.	Elective.	1880
Mills, Arthur L.	I.	1876
Minot, Charles S.	V.	1872
Mitchell, Guy E.	II.	1891
Mixter, Samuel J.	VIII.	1875
Moody, Burdett	I.	1890

NAME.	COURSE.	CLASS.
Moody, Herbert R.	V.	1892
Moore, Frank A.	IV.	1888
Moore, Fred. Clouston	II.	1891
Moore, Frederick Campbell	X.	1892
Moore, Fred F.	I.	1891
Moore, Harry C.	II.	1888
Moore, Stephen W.	II.	1890
Morgan, Frank H.	V.	1878
Morrill, Asa H.	I.	1892
Morrison, Frank C.	I.	1882
Morse, Frank B.	I.	1873
Morse, Philip S.	III.	1884
Morss, Everett	III.	1885
Moseley, Alexander W.	II.	1891
Mosman, Philip A.	III.	1887
Mossman, William	VI.	1891
Mott, William E.	I.	1889
Mower, George A.	II.	1881
Mudge, Benjamin C.	I.	1877
Mulliken, Samuel P.	V.	1887
Mumford, Edgar H.	II.	1886
Munroe, James P.	III.	1882
Myrick, Willis H.	II.	1874
Neave, Charles	VI.	1890
Newell, Allan H.	II.	1890
Newell, Frederick H.	III.	1885
Newkirk, Walter M.	II.	1892
Newman, Frank E.	IV.	1892
Nichols, Everell J.	I.	1878
Nichols, William R.	V.	1869
Nickerson, Addison D.	I.	1888
Nickerson, William E.	V.	1876
Nims, Norman G.	IV.	1890
Norris, Almon E.	II.	1890
Norris, Clarence G.	I.	1890
Norris, George L.	III.	1887
Norris, Webster	III.	1881
Norton, Fred E.	II.	1891
Noyes, Arthur A.	V.	1886
Noyes, Harry L.	I.	1890
Noyes, Joseph K.	I.	1890
Nute, Joseph E.	I.	1885
Ober, Arthur J.	I.	1892
O'Grady, Marcella I.	IX.	1885
Ordway, Evelyn W.	V.	1881
Otis, Hamilton	I.	1892
Owen, Edward H., Jr.	II.	1879
Oxford, George H. K.	VI.	1891
Oxnard, Benjamin A.	III.	1875
Packard, George A.	III.	1890
Palmer, William I.	VI.	1891
Paraschos, Nicolas T.	I.	1892
Park, Charles F.	II.	1892
Parker, Theodore	I.	1881
Parrish, James S.	II.	1892
Parsons, Charles O.	III.	1873
Patch, Maurice B.	III.	1872
Patterson, Geo. W., Jr.	VI.	1887
Peabody, Cecil H.	II.	1877
Pearson, Edwin R.	VI.	1888
Perkins, Frank E.	IV.	1892
Perkins, Herbert B.	I.	1874
Perry, John C.	II.	1892
Peters, Quintard	IX.	1887
Peterson, Charles A.	VI.	1888
Peyton, William R.	II.	1890
Phillipps, George	III.	1873
Phillips, Henry A.	IV.	1873
Phillips, Henry M.	VI.	1892
Phipps, David W.	Phil.	1876
Pickering, William H.	VIII.	1879
Pickernell, Frank A.	VI.	1885
Pierce, Arthur G.	VI.	1892
Pierce, Arthur W.	VI.	1892
Pierce, Edward L., Jr.	II.	1886
Pierce, Herbert F.	I.	1888
Pierce, Richard H.	VI.	1885
Pike, Clayton W.	VI.	1889
Pike, William A.	I.	1871
Plimpton, Arthur L.	I.	1877
Plimpton, Thomas D.	II.	1875
Poland, William B.	I.	1890
Pond, Frank H.	II.	1874
Pool, George B.	VI.	1888
Pope, Macy S.	I.	1892
Power, Charles W.	VI.	1889
Pratt, Dana M.	I.	1892
Pratt, George H.	V.	1871

NAME.	COURSE.	CLASS.
Prentiss, Frederick H.	II.	1878
Prentiss, Wm. A.	Sci. and Lit.	1875
Prescott, Charles O.	V.	1884
Prichard, Charles F.	II.	1876
Puffer, William L.	III.	1884
Purinton, Arthur J.	II.	1884
Raeder, Henry	I.	1876
Ramsey, Allan	VII.	1891
Randall, Newbert M.	III.	1885
Ranlett, Arthur G.	III.	1892
Ranno, Fred W.	I.	1889
Ray, J. States	II.	1888
Raymond, Edward B.	VI.	1890
Read, Carleton A.	II.	1891
Reynolds, George F.	II.	1886
Rhodes, Frederick L.	VI.	1892
Rice, Calvin W.	VI.	1890
Rice, Carrie L.	V.	1882
Rich, Charles L.	I.	1876
Rich, William J.	III.	1884
Richards, Ellen H.	V.	1873
Richards, Franklin B.	III.	1884
Richards, Robert H.	III.	1868
Richardson, Charles F.	II.	1886
Richardson, George L.	I.	1889
Richardson, Herbert A.	V.	1887
Richardson, William C.	II.	1891
Richmond, Knight C.	II.	1890
Ricker, Charles W.	VI.	1891
Riggs, George F.	I.	1879
Ripley, Henry L.	I.	1873
Ripley, William T.	II.	1882
Ripley, William Z.	I.	1890
Ritchie, James	I.	1878
Robb, Russell	VI.	1888
Robbins, Arthur G.	I.	1886
Roberts, Harold B.	II.	1890
Roberts, Odin B.	II.	1888
Roberts, William J.	I.	1891
Robertson, Andrew R.	II.	1892
Robinson, C. Snelling	III.	1884
Robinson, Dwight P.	VI.	1892
Robinson, Edward	II.	1890
Robinson, Theodore W.	III.	1884
Robinson, Thomas W.	III.	1876
Rogers, Allen H.	III.	1890
Rogers, Minnie H.	IX.	1890
Rollins, Edward W.	III.	1871
Rollins, James W., Jr.	I.	1878
Roots, Willard H.	IX.	1891
Rose, Frederick H.	II.	1891
Rosewater, William M.	II.	1892
Ross, Henry F.	III.	1882
Ross, John H.	Sci. and Lit.	1882
Rotch, A. Lawrence	II.	1884
Rounds, George W.	VI.	1889
Rowell, George F.	I.	1892
Ruggles, Horace F.	II.	1892
Russel, Richard L.	I.	1889
Russell, L. Kimball	V.	1886
Ryder, Josiah P.	V.	1884
Sabine, Annie W.	VIII.	1888
Sackett, Ward M.	VI.	1892
Safford, Frederick H.	VI.	1888
Sage, Henry J.	VI.	1892
Sager, Oscar F.	II.	1892
Sanborn, Frank E.	II.	1889
Sargent, Albert F., Jr.	I.	1892
Sargent, Francis T.	II.	1875
Sargent, Welland F.	I.	1875
Saunders, Robert T.	I.	1892
Sauveur, Albert	III.	1889
Sawin, Chas. D.	Sci. and Lit.	1878
Sawyer, Alfred H.	II.	1888
Sawyer, Chas. A.	Sci. and Lit.	1876
Sayer, Frederick L.	II.	1888
Schmidt, Louis	V.	1890
Schwamb, Peter	II.	1878
Schwarz, Franz H.	II.	1887
Schwarz, Theodore E.	III.	1876
Scott, Robert W.	II.	1883
Sears, Henry D.	VI.	1887
Sears, Walter H.	I.	1868
Seavey, John F.	II.	1886
Selfridge, Russell	IX.	1892
Shailer, Robert A.	I.	1873
Shattuck, Arthur F.	V.	1891
Shaw, Edward S.	I.	1874

NAME.	COURSE.	CLASS.
Shaw, Walter K.	II.	1888
Shed, Nathaniel W.	V.	1881
Shepard, Edward V.	I.	1889
Shepard, Frank E.	II.	1887
Shepard, Walter	I.	1872
Shepard, William E.	VI.	1886
Shepherd, Frank C.	XI.	1892
Sherman, Adelaide	V.	1890
Sherman, Chas. W.	I.	1890
Sherman, LeRoy K.	I.	1892
Shockley, William H.	III.	1875
Shute, Harry D.	VI.	1892
Silsbee, Francis H.	II.	1874
Simpson, Edmund T.	V.	1890
Simpson, James E.	III.	1886
Sjöström, Ivar L.	I.	1888
Skinner, Theodore H.	IV.	1892
Slater, Howard C.	II.	1890
Small, Nathaniel C.	V.	1880
Smith, Arthur C.	V.	1892
Smith, Charles A.	I.	1868
Smith, Charles P.	II.	1887
Smith, Clarence W.	V.	1888
Smith, Edward M.	II.	1888
Smith, George A.	V.	1883
Smith, Harry E.	V.	1887
Smith, J. Waldo	I.	1887
Smith, Walter W.	II.	1871
Smith, William L.	VI.	1890
Snead, William R.	IV.	1881
Snelling, Grenville T.	IV.	1882
Snow, Walter B.	II.	1882
Snow, William G.	II.	1889
Snyder, Frederick T.	VI.	1891
Sonnemann, George A.	III.	1890
Soule, Richard H.	II.	1872
Souther, Henry, Jr.	III.	1887
Southworth, Harry C.	III.	1877
Southworth, Martin O.	VI.	1890
Spalding, Frederic P.	I.	1878
Spaulding, Henry P.	VI.	1892
Spaulding, Hollon C.	II.	1887
Spencer, Theodore	VI.	1891
Spooner, George H.	VI.	1891
Sprague, Timothy W.	III.	1887
Stafford, C. Edward	III.	1873
Stantial, Frank G.	V.	1879
Stantial, Otis T.	III.	1885
Stanwood, James B.	II.	1875
Stanwood, James H.	I.	1887
Stearns, Harold E.	II.	1881
Stearns, William S.	I.	1879
Stebbins, Alfred, Jr.	III.	1884
Stebbins, Theodore	VI.	1886
Stetson, Frank O.	V.	1888
Stewart, Charles E.	I.	1877
Stix, Solomon H.	IV.	1891
Stickney, Delia	V.	1889
Stimpson, Thomas F.	III.	1877
Stoddard, Arthur B.	V.	1891
Stoddard, Henry F.	II.	1887
Stone, Charles A.	VI.	1888
Stone, Charles F.	III.	1871
Stone, G. Goodwin	III.	1889
Stone, Joseph	I.	1868
Storrow, Samuel	I.	1890
Story, Isaac M.	I.	1878
Stoughton, Augustus B.	II.	1886
Sturges, Benton	IX.	1890
Sturgis, Elliot T.	III.	1884
Sturtevant, Thomas J.	VI.	1890
Sully, John M.	III.	1888
Susmann, Julius H.	III.	1876
Swain, George F.	I.	1877
Swan, James	II.	1891
Swanton, Frederick W.	VI.	1890
Sweetland, Ralph	II.	1889
Sweetser, Arthur W.	I.	1874
Sweetser, Ralph H.	III.	1892
Sykes, Henry H.	VI.	1891
Taintor, Giles	VI.	1887
Talbot, Henry P.	V.	1885
Talbot, Marion	IX.	1888
Tallant, George P.	IX.	1892
Taney, Edmund	I.	1878
Taylor, Harry B.	V.	1891
Taylor, Robert R.	IV.	1892
Taylor, William M.	II.	1886

NAME.	COURSE.	CLASS.
Tenney, Frank	III.	1883
Thalheimer, William C.	I.	1892
Thomas, Edward G.	II.	1887
Thompson, Frederick	I.	1887
Thompson, Herbert A.	VIII.	1891
Thompson, Sanford E.	I.	1889
Thompson, Walter S.	I.	1887
Thorp, Frank H.	V.	1889
Thurber, William B.	IX.	1889
Tilden, Bryant P.	III.	1868
Tillinghast, Theodore F.	I.	1870
Tinkham, Samuel E.	I.	1873
Tolman, James P.	III.	1868
Tompkins, Charles H., Jr.	III.	1883
Towne, John H.	IX.	1890
Towne, Linwood O.	III.	1878
Towne, Walter I.	VI.	1888
Townsend, Walter D.	III.	1876
Trowbridge, Almarin, Jr.	II.	1871
Trowbridge, Walter B.	II.	1892
Truesdell, Arthur E.	VI.	1889
Tucker, Greenleaf R.	V.	1887
Tucker, H. Judson	VI.	1887
Turnbull, Charles D.	II.	1886
Turner, Edmund K.	I.	1870
Twombly, Alexander H.	II.	1887
Tyler, Alice Brown	V.	1884
Tyler, Clifford M.	II.	1891
Tyler, Harry W.	V.	1884
Underhill, William W.	II.	1889
Underwood, George R.	V.	1883
Vaillant, George W.	III.	1892
Van Alstine, David	II.	1886
Vanier, George P.	III.	1885
Verges, Luis F.	I.	1891
Very, Frank W.	V.	1873
Vielé, Francis S.	VI.	1891
Vielé, Maurice A.	II.	1886
Vining, John F.	IV.	1892
Vorce, Clarence B.	I.	1888
Vose, Ralph	VI.	1887
Wait, Henry H.	VI.	1891
Waite, Charles N.	V.	1876
Waitt, Arthur M.	II.	1879
Waitt, Henry M.	I.	1876
Wales, Thomas C., Jr.	VI.	1892
Walker, Elton D.	I.	1890
Walker, Francis	IX.	1892
Walker, Robert T.	IV.	1890
Wallace, Charles F.	VI.	1892
Ward, Clarence S.	III.	1872
Ward, Nahum	V.	1884
Ware, Robert C.	Sci. and Lit.	1847
Warner, Charles H.	VI.	1889
Warner, George M.	VI.	1891
Warner, Murray	II.	1892
Warren, A. Sydney	III.	1888
Warren, Edward R.	VII.	1881
Warren, H. L. J.	III.	1875
Warren, Joseph A.	XI.	1892
Wason, Leonard C.	VI.	1891
Waterman, Charles C.	VI.	1892
Waterman, Richard, Jr.	IX.	1892
Webb, Henry S.	VI.	1892
Webster, Edwin S.	VI.	1888
Webster, William R.	III.	1875
Weed, Henry T.	V.	1891
Weeks, Isaiah S. P.	I.	1871
Weil, Charles L.	II.	1888
Wells, Edward C.	II.	1892
Wells, Webster	I.	1873
Wendell, George V.	VIII.	1892
Wesson, David	V.	1883
Westcott, Frank T.	I.	1892
Weston, William H.	III.	1891
Wetherbee, Charles P.	II.	1891
Whipple, George C.	I.	1889
Whittaker, Channing	II.	1869
White, Anthony C.	VIII.	1882
White, Anne E.	V.	1891
White, Franklin W.	VII.	1890
Whiting, Jasper	III.	1889
Whitmore, Walter G.	VI.	1887
Whitney, Frank P.	VI.	1889
Whitney, Granger	III.	1887
Whitney, William A.	I.	1887
Whitney, William M.	II.	1884
Whitney, Willis R.	V.	1890

NAME.	COURSE.	CLASS.
Whittier, Randal	V.	1871
Wiggin, Frank E.	I.	1877
Wilcox, Herbert A.	III.	1887
Wilder, C. Morris	VI.	1886
Wilder, Steph. H.	Sci. and Lit.	1874
Wilder, Salmon W., Jr.	X.	1891
Wilkes, Charles M.	IV.	1881
Willard, Daniel W.	II.	1870
Williams, Arthur S.	VI.	1888
Williams, Emile F.	I.	1878
Williams, Francis C., Jr.	I.	1884
Williams, Francis H.	V.	1873
Williams, Robert C.	III.	1889
Williams, Sidney	I.	1887
Williston, Arthur L.	II.	1889
Wilson, Arthur R.	I.	1890
Wilson, Elwood J.	III.	1886
Wilson, Fred A.	II.	1891
Windett, Victor	II.	1889
Winslow, Arthur	III.	1881
Wood, Charles	I.	1886
Wood, Charles H.	II.	1891
Wood, Frederick W.	III.	1877
Wood, Henry B.	I.	1876
Wood, Louis F.	V.	1873
Woodbury, Charles H.	II.	1886
Woodman, Andrew W.	I.	1890
Woodman, Caroline A.	VII.	1889
Woodward, Amos E.	III.	1888
Woolworth, James G.	V.	1878
Worcester, Vernor F.	II.	1886
Worthington, Arthur M.	VII.	1892
Worthington, Erastus, Jr.	I.	1885
Wrinkle, Laurence F. J.	III.	1870
Wuichet, Walter G.	II.	1889
Young, Fred R.	III.	1886
Young, John E.	I.	1888

TITLES OF THESES

OF SUCCESSFUL CANDIDATES FOR THE DEGREE OF BACHELOR OF SCIENCE, JUNE, 1892.

CHARLES ALSTON BEAL,

Relation of the Candle Power of Incandescent Lamps to the Current, Voltage, and Energy Consumed. (*With C. H. Chase.*)

ALICE HOOPER BECKLER,

Observations on the Physiology of the Circulatory and Nervous Systems of the Earthworm (*Lumbricus terrestris, L.*).

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