M.I.T. ANNUAL CATALOGUES AND BULLETINS
1890/91
01 OF 03

MASSACHUSETTS INSTITUTE OF TECHNOLOGY,

BOSTON.

ANNUAL CATALOGUE.

1890–1891.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY,

BOSTON.

Special attention is called to the change of dates for the Examinations for Entrance, in June, and for Advanced Standing, in September, for which, as now appointed, see Calendar on page 2.

1890–1891.

JOHN WILSON AND SON.
University Press, Cambridge.
1890.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, BOSTON.

TWENTY-SIXTH

ANNUAL CATALOGUE

OF THE

OFFICERS AND STUDENTS,

WITH

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

1890--1891.

JOHN WILSON AND SON.
University Press, Cambridge.
1890.

CALENDAR FOR 1890-91.

School year began	Monday, Sept. 29, 1890.
Second term will begin	Tuesday, Feb. 3, 1891.
Degrees conferred	Tuesday, June 2, 1891.
First Entrance Examinations	Thursday, June 25, 1891, and Friday, June 26, 1891.
Second Entrance Examinations	Tuesday, Sept. 22, 1891, and Wednesday, Sept. 23, 1891.
Examinations for Advanced Standing	Wednesday, Sept. 16, 1891.
School year of 1891-92 will begin	Monday, Sept. 28, 1891.

CALENDAR FOR 1891-92.

School year will begin	Monday, Sept. 28, 1891.
Second term will begin	Tuesday, Feb. 2, 1892.
Degrees conferred	Tuesday, June 1, 1892.
First Entrance Examinations	Thursday, June 24, 1892, and Friday, June 25, 1892.
Second Entrance Examinations	Tuesday, Sept. 21, 1892, and Wednesday, Sept. 22, 1892.
Examinations for Advanced Standing	Wednesday, Sept. 15, 1892.
School year of 1892-93 will begin	Monday, Sept. 27, 1892.

Meetings of the Corporation	Oct. 8 and Dec. 10, 1890. March 11, and May 29, 1891.
Stated Meetings of the Executive Committee of the Corporation	First and third Tuesday of every month.

CONTENTS.

METHODS AND APPARATUS OF INSTRUCTION, — *continued.*

Massachusetts Institute of Technology.

Historical Sketch. — 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. In this charter, the threefold plan outlined by Professor Rogers, who became the first President of the Institute of Technology, was preserved.

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 it, and it alone, as the Institute. The present publication is thus of necessity mainly a catalogue of its courses of study, officers, and students. The School was opened in February, 1865, with twenty-seven pupils. It is devoted to the 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, physics, biology, and geology. Courses of a less technical nature, designed as a preparation for business callings, and a course preparatory to the professional study of medicine, are also given.

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, with a list of present students, will be found on pages 156 to 159.

The Society of Arts held its first meeting on April 8, 1862. Its objects are to awaken and maintain an interest in the practical sciences, and to aid in their advancement. Meetings are held semi-monthly from October to May, at which inventions, discoveries, and matters of scientific and technical interest are presented. Its "Proceedings," with a list of its officers and members, are annually 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 New Building, corner of Boylston and Clarendon Streets, mainly devoted to the departments of chemistry, physics, electricity, and architecture, 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.

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Assistant in Forging.

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Assistant in Wood-work.

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Assistant in Machine-Tool work.

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GEORGE W. BLODGETT, S. B., *on Applications of Electricity to Railway Working.*

HENRY M. HOWE, A. M., S. B., *on Metallurgy.*

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FRANKLIN W. WHITE, S. B., *on Bacteriology.*

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Courses of Instruction.

The Massachusetts Institute of Technology provides an extended series of scientific and literary studies, and of practical exercises. The courses of study include the Physical, Chemical, and Natural Sciences and their applications; Pure and Applied Mathematics; Drawing; the English, French, German, and other Modern Languages; History; Political Science; and International and Business Law. These studies and exercises are so arranged as to afford a liberal and practical education in preparation for active pursuits, as well as a thorough training for most of the scientific professions. The positions and the character of the work for which these prepare the graduates are best shown by the record of the present occupations of graduates (see page 161).

Regular Courses. — The following regular courses of study, each of four years' duration, have been established; and for proficiency in any one of them, the degree of Bachelor of Science (S. B.) in the course pursued is conferred. Descriptions of the courses are given on the pages referred to.

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.

The first year for all courses is the same (see page 23), and contains subjects which are considered essential as preliminary training, or as a foundation for the more strictly professional studies of the later years. At the end of the first year the regular student selects the course which he will pursue during the remaining three years, and his work becomes more specialized thereafter as it progresses.

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 25 to 49), the statements made in regard to the various branches of study (for example, Mathematics, Language, Chemistry, Physics, etc.) in the paragraphs descriptive of the "Methods and Apparatus of Instruction," pages 61 to 92, and by referring at the same time to the "Schedule of Topics," pages 93 to 115. 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 a considerable latitude in the selection of the branch of his intended profession to which he will specially devote his energies in the later years of his study. This is accomplished by means of options. Thus in Civil Engineering, page 25, he may elect Sanitary and Hydraulic Engineering, Geodesy, or an advanced Course in Railroad Engineering and Management; in Mechanical Engineering, page 27, he may choose either Marine Engineering, Locomotive Construction, or Mill Engineering; and similarly for other courses. Inspection of the course descriptions and schedules, pages 24 to 49, will show the nature and effect of the options. In some cases 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 93 to 115.

Advanced Courses of study may be pursued either with or without reference to the advanced degrees authorized by the Corporation. (See page 50.)

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 at page 50.

Methods and Apparatus of Instruction. — The statements on pages 61 to 92 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 topic, the name of the instructor, and the preparation required for admission to exercises in that subject. 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 for the topic considered. 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 93.) The numbers in the left-hand column of the schedule correspond with those in the several course schemes, pages 23 to 49.

REGULAR COURSES.

SCHEDULES OF PRESCRIBED AND OPTIONAL STUDIES.

FIRST YEAR.

COMMON TO ALL REGULAR COURSES.

FIRST TERM.	Number
Solid Geometry	16
Algebra	15
General Chemistry	125
Chemical Laboratory	125
Rhetoric and English Composition	55
French (or German)	70 (74)
Mechanical Drawing	50
Freehand Drawing	51
Military Drill.	

SECOND TERM.	Number
Plane and Spherical Trigonometry	18
General Chemistry	125
Chemical Laboratory	125
Political History since 1815	185
French (or German)	70 (74)
Mechanical Drawing	50
Freehand Drawing	51
Military Drill.	

For descriptions of the methods, etc., used in the above instruction, see pages 61 to 64, and page 91.

NOTE. — The numbers opposite the various subjects in the course schemes are those of the corresponding titles in the Schedule of Topics, pages 95 to 115, to which reference may thus be easily made, for further details.

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 the instruments and the problems of general occurrence. The fourth year is devoted to purely professional work.

To meet the rapid specialization now going on in the various departments of civil engineering, the course offers, principally in the fourth year, three options or lines of study,—namely, a general course in Civil Engineering; a course in which more than usual attention is devoted to highways, railroads, and railroad management; and a course giving special attention to geodesy, geology, 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; in advanced Surveying; also courses in Railroad and Highway Engineering; in Stereotomy; and in elementary Construction and Design. 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, students taking the geodetic option are required to devote several weeks to field-work in geology, topography, and geodesy.

Descriptions of the methods and nature of instruction in the several professional topics will be found on pages 72 to 76.

I.—CIVIL ENGINEERING.

FIRST YEAR COMMON TO ALL COURSES. SEE PAGE 23.

SECOND YEAR.

FIRST TERM.	Number
Surveying and Plotting	200
Topographical Drawing	203
Descriptive Geometry	52
Descriptive Astronomy	156
Analytic Geometry	20
Physics	155
Political Economy	95
German	73

SECOND TERM.	Number
Surveying and Plotting	200
Differential Calculus	22
Physics	155
Physical Geography	360
English Literature	56
German	73
Mineralogy	366

THIRD YEAR.

FIRST TERM.	
Railroad and Highway Engineering, with Field-work and Drawing	206, 208
Stereotomy	212
Advanced Surveying	204
Integral Calculus	23
General Statics	41
Physics: Heat	159
Physical Laboratory	160
Structural Geology	361
German	74
English Composition	57

SECOND TERM.	
Railroad and Highway Engineering, with Field-work and Drawing	206, 208
Advanced Surveying	204
Elements of Construction	219
Elementary Design	220
Spherical and Pract. Astronomy	40
Physical Laboratory	160
Historical Geology	364
German	74
Strength of Materials, Kinematics, and Dynamics	42

FOURTH YEAR.

FIRST TERM.		
Theory of Structures		221
Bridges and Roofs		222
Hydraulics		213
Strength of Materials, Theory of Elasticity		44
Metallurgy of Iron		294
Elements of Geodesy		205a
Options.		
1.	Sanitary Engineering	214
	Bridge Design	223
	Hydraulic Measurements and Sanitary Field-work	218
2.	Railroad Engineering	210
	Railroad Management	211
	Bridge Design	223
3.	Least Squares	30
	Geodesy	205
	Physical Laboratory	170
	Hydraulic Measurements	218

SECOND TERM.		
Theory of Structures		221
Bridges and Roofs		222
English Composition		57
Business Law		124
Thesis Work.		
Options.		
1.	Hydraulic Engineering	217
	Machinery and Motors	44
	Bridge and Sanitary Design	223, 215
	Public Hygiene	390
2.	Railroad Engineering	210
	Machinery and Motors	48
	Bridge Design	223
3.	Hydraulic Engineering	217
	Geodesy and Map Projection	205
	Design.	
	Differential Equations	29

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 ground-work 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 work of the department proper, beginning with a 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 such subjects as dynamometers, governors, fly-wheels, effect of reciprocating parts of engines, steam-pumps, cylinder condensation, hydraulics, and hydraulic motors, etc. The option is given of courses in locomotive construction, mill engineering, or marine engineering. With the last, instruction in naval construction is given to those who desire it.

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. In the fourth year a course in machine design is given.

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 61, 62, 71, 76–80.)

II. — MECHANICAL ENGINEERING.

FIRST YEAR COMMON TO ALL COURSES. SEE PAGE 23.

SECOND YEAR.

FIRST TERM.	Number
Principles of Mechanism	240
Drawing	242
Carpentry and Wood-turning (shopwork)	263
Analytic Geometry	20
Descriptive Geometry	52
Physics	155
Political Economy	95
German	73

SECOND TERM.	Number
Construction of Gear-teeth, Mechanism of Cotton Machinery, Mechanism of Machine Tools	245
Drawing	242
Pattern Work (shopwork)	264
Differential Calculus	22
Physics	155
English Literature	56
German	73

THIRD YEAR.

FIRST TERM.	
Valve Gears, Thermodynamics, Steam Engineering	248
Drawing	249
Forging (shopwork)	265
Integral Calculus	23
General Statics	41
Physics: Heat	159
Physical Laboratory	160
German	74

SECOND TERM.	
Steam Engineering; Boilers	248
Drawing, Design, and Use of Surveying Instruments	201, 249
Engineering Laboratory	253
Forging; Chipping and Filing (shopwork)	265, 266
Strength of Materials, Kinematics, and Dynamics	42
Physical Laboratory	160
English Composition	57
Business Law	124
German	74

FOURTH YEAR.

FIRST TERM.	
Steam Engineering	254
Hydraulics	213
Dynamics of Machines	255
Machine Design	257
Engineering Laboratory	259
Chipping and Filing; Machine-Tool Work (shopwork)	266, 267
Strength of Materials, Friction	45
Metallurgy of Iron	294
Heating and Ventilation	185
Options.	
1. Marine Engineering	261
2. Locomotive Construction	260
3. Mill Engineering	262

SECOND TERM.	
Hydraulic Motors	216
Engineering Laboratory	259
Machine-Tool Work (shopwork)	267
Strength and Stability of Structures, Theory of Elasticity	47
English	57
Thesis Work.	
Options.	
1. Marine Engineering	261
2. Locomotive Construction	260
3. Mill Engineering	262

III. — MINING ENGINEERING AND METALLURGY.

The mining and metallurgical professions formerly demanded of their members an especially wide range of attainments, so that the student was obliged to acquaint himself with many different branches of civil and mechanical engineering, as well as chemistry, metallurgy, and geology. With the gradual disappearance of this more primitive condition, the demand seems now plainly to indicate that, instead of endeavoring to fit himself in all possible directions, the student should select at the outset the line which he will follow, and should devote himself to this with correspondingly greater thoroughness. The schedules here presented are arranged in accordance with this view; and each is thus enabled to afford an increase in subjects of direct technical importance.

The first two options (page 29) afford distinctively mining engineering courses, and contain, respectively, mechanical engineering and civil engineering subjects; the last two options (page 31) form metallurgical courses, characterized, respectively, by mechanical engineering and chemistry. Throughout the first three schedules, mathematics is prominent, continuing four years. In the fourth, the special characteristic is chemistry, with no mathematics beyond the second year.

The first option trains the student with a view to the eventual management of mining industries. It therefore contains mineralogy, geology, assaying, mining, ore-dressing, and metallurgy, — the last to a less extent than options 3 and 4, — but with a large amount of mechanical engineering; namely, mechanism, thermodynamics of steam, applied mechanics, mechanical engineering laboratory, etc., with particular reference to applications in mining engineering. Pure mathematics is necessarily continued into the third year, and its applications extend through the fourth year. The full course in physics is included, and a brief course on dynamo-electric machines is given.

III.—MINING ENGINEERING AND METALLURGY.

(MINING ENGINEERING.)

FIRST YEAR COMMON TO ALL COURSES. SEE PAGE 23.

SECOND YEAR.

FIRST TERM.	Number
Physics	155
German	73
Analytic Geometry	20
Blowpipe Silver Assay	290
Political Economy	95
Descriptive Geometry	52
Options.	
1. Principles of Mechanism	240
1. Surveying	202
2. Surveying	200
2. Topographical Drawing	203

SECOND TERM.	Number
English Literature	56
Differential Calculus	22
Physics	155
German	73
Determinative Mineralogy	366
Options.	
1. Drawing; Mechanism	243, 246
1. Physical Geography (elective)	360
2. Surveying and Drawing	200
2. Physical Geography	360

SUMMER COURSE IN PRACTICAL MINING AND SURVEYING (ELECTIVE).

THIRD YEAR.

FIRST TERM.	
Integral Calculus	23
General Statics	41
Geology	362
German	74
Mining	292
Physics: Heat	159
Physical Laboratory	160
Options.	
1. Steam Engineering; Thermodynamics	248
1. Drawing	250
2. Railroad Engineering	206
2. Field-work and Drawing	208

SECOND TERM.	
Strength of Materials, Kinematics, and Dynamics	42
Physical Laboratory	160
Assaying	293
German	74
Mining	292
Geology	363
Options.	
1. Steam Engineering	248
1. Engineering Laboratory	253
2. Railroad Engineering	206
2. Field-work and Drawing	208

FOURTH YEAR.

FIRST TERM.	
Ore-Dressing	298
Metallurgy	294, 295
Mining Laboratory	296
Dynamo Machinery	186
Memoirs. English Criticism.	
Options.	
1. Strength of Materials; Friction	45
1. Steam Engineering	254
1. Hydraulics	213
1. Engineering Laboratory	259
2. Strength of Materials; Theory of Elasticity	44
2. Hydraulics	213
2. Hydraulic Measurements	218
2. Theory of Structures	221

SECOND TERM.	
Metallurgy	299
Mining Laboratory	297
Business Law	124
Memoirs. English Criticism.	
Options.	
1. Strength and Stability of Structures; Theory of Elasticity	47
1. Engineering Laboratory	259
2. Machinery and Motors	48
2. Electric Railroads.	
2. Hydraulic Engineering	217

The second option differs from the first mainly in that the engineering subjects are of civil rather than mechanical engineering; namely, surveying, drawing, railroad engineering, with field-work, and drawing, engineering construction, hydraulics, electric railroads, with the full course in applied mechanics. This course is designed for students who wish to become mine-surveyors, engineers, or superintendents. In both of these options pure chemistry terminates with the first year, all subsequent chemical work being only such as is included in the instruction in metallurgy, assaying, mineralogy, etc.

The third option provides a course in metallurgical engineering. Chemistry is continued through the third year and a part of the fourth, and the amount of metallurgical work is greatly increased. The engineering subjects are the same as those of the first option, — that is, branches of mechanical engineering related to metallurgical industries, — except that applied mechanics is discontinued at the middle of the fourth year. The work in physics is the same as in the other schedules, except that special instruction in heat measurements is introduced into the fourth year. This course looks particularly towards superintendence in iron, lead, copper, and zinc works.

The fourth option is devoted to metallurgical chemistry. In mining and metallurgical subjects it is identical with the third, but the engineering subjects are replaced by analytical, theoretical, and industrial chemistry. The study of physics is continued by electricity in the third, and by heat measurements and electro-metallurgy in the fourth year. The aim of this course is towards the position of chemist of works, and may lead to general management. The four schedules also contain nearly or quite the full amount of language, literature, history, and political economy given in the other engineering courses.

III.—MINING ENGINEERING AND METALLURGY.

(METALLURGY.)

FIRST YEAR COMMON TO ALL COURSES. SEE PAGE 23.

SECOND YEAR.

FIRST TERM.	Number
Physics	155
German	73
Analytic Geometry	20
Political Economy	95
Analytical Chemistry	126
Options.	
3. Descriptive Geometry	52
3. Principles of Mechanism	240
3. Blowpipe Silver Assay (elective)	290
4. Theoretical Chemistry	127
4. Blowpipe Silver Assay	290

SECOND TERM.	Number
Differential Calculus	22
English Literature	56
Physics	155
German	73
Determinative Mineralogy	291
Options.	
3. Mechanism; Drawing	243
3. Analytical Chemistry (elective)	126
4. Analytical Chemistry	126

THIRD YEAR.

FIRST TERM.	
Analytical Chemistry, Lectures and Laboratory	129
German	74
Physics: Heat	159
Physical Laboratory	160
Options.	
3. Integral Calculus	23
3. General Statics	41
3. Steam Engineering, Thermodynamics	248
3. Drawing	250
4. Electricity	164
4. Industrial Chemistry	130
4. Industrial Laboratory	139
4. Drawing.	
4. English Composition	57

SECOND TERM.	
Analytical Ghemistry, Lectures and Laboratory	129
Assaying	293
German	74
Physical Laboratory	160
Options.	
3. Strength of Materials, Kinematics, and Dynamics	42
3. Steam Engineering	248
3. Engineering Laboratory	253
4. Industrial Chemistry	130
4. Industrial Laboratory	139
4. Theoretical Chemistry	128
4. English Composition	57
4. Business Law	124

FOURTH YEAR.

FIRST TERM.	
Heat Measurements	171
Dynamo Machinery	186
Metallurgy	294, 295
Ore-Dressing	298
Memoirs. English Criticism.	
Options.	
3. Strength of Materials; Friction	43
3. Steam Engineering	254
3. Hydraulic Engineering	213
3. Engineering Laboratory	259
3. Mining and Metallurgical Laboratory	296
4. Analytical Chemistry	133
4. Electro-metallurgy.	
4. Drawing.	
4. Metallurgical Laboratory	296

SECOND TERM.	
Metallurgy	299
Analytical Chemistry	133
Memoirs. English Criticism.	
Options.	
3. Technical Machinery	269
3. Engineering Laboratory	259
3. Metallurgical and Mining Laboratory	297
4. Metallurgical and Mining Laboratory	297

IV.—ARCHITECTURE.

Throughout this, as in the engineering courses, extends a full course in mathematics, pure and applied, to serve as a basis for professional work. (See pages 61 and 71.)

The more strictly professional work 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, problems, and visits to buildings. The subject of specifications and contracts is thoroughly discussed. Practice in architectural design is continued throughout the course. Instruction is given in sketching in black and white and in water-color, and in drawing both from the cast and from life. Regular students pursue, in addition to this work, courses in German, French, English, and physics.

Special students in Architecture should be graduates of colleges, or have had at least two years' experience in an architect's office, or be of mature age. Although the regular entrance examinations will not be required of them, they must show thorough preparation in mechanical and free-hand drawing.

IV.—ARCHITECTURE.

FIRST YEAR COMMON TO ALL COURSES. SEE PAGE 23.

SECOND YEAR.

FIRST TERM.	Number
Analytic Geometry	20
Descriptive Geometry	52
Political Economy	95
German	73
Physics	155
Orders	322
Free Hand Drawing	338
Shades and Shadows	323

SECOND TERM.	Number
Differential Calculus	22
English Literature	56
German	73
Physics	155
Architectural History	320
Materials	325
Perspective	323
Pen and Ink	336
Free Hand Drawing	338
Original Design	333

THIRD YEAR.

FIRST TERM.	
Integral Calculus	23
General Statics	41
German	74
English Composition	57
Physics: Heat	159
Architectural History	320
Structural Geology	361
Specifications and Working Drawings	326
Free Hand Drawing	339
Pen and Ink	337
Original Design	334

SECOND TERM.	
Strength of Materials, Kinematics and Dynamics	42
English Composition	57
Business Law	124
German	74
Specifications and Working Drawings	326
Stereotomy	328
Water-color	340
Free Hand Drawing	339
Pen and Ink	337
Original Design	334

FOURTH YEAR.

FIRST TERM.	
Strength of Materials, Stability of Structures	46
Advanced French	75
Acoustics.	
Heating and Ventilation	185
History of Ornament	332
Sanitary Science	397
History of the Renaissance	87
Water-color	341
Graphical Statics	343
History of Construction	331
Original Design	335

SECOND TERM.	
Sanitary Science	397
Advanced French	75
Iron Construction	327
History of the Renaissance	87
Business Relations, Contracts, etc.	329
History of Ornament	332
Modelling.	
Water-color	341
Original Design: Thesis Work	335
History of Painting and Sculpture	342

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 those who intend to become teachers of chemistry.

The class-room work consists of a course of lectures on general chemistry, and lectures 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. Analytical chemistry — qualitative and quantitative — is begun in 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, there is allowed great latitude in the choice of subjects 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 66–70.

V.—CHEMISTRY.

FIRST YEAR COMMON TO ALL COURSES. SEE PAGE 23.

SECOND YEAR.

FIRST TERM.	Number
Analytical Chemistry	126
Theoretical Chemistry	127
Physics	155
German	73
Political Economy	95
Analytic Geometry	20

SECOND TERM.	Number
Analytical Chemistry	126
Mineralogy and Blowpipe Analysis	291
Physics	155
German	73
English Literature	56
Options.	
1. Differential Calculus	22
2. { Physical Geography	360
2. { Microscopy	381

THIRD YEAR.

FIRST TERM.	
Analytical Chemistry; Laboratory and Lectures	129
Industrial Chemistry	130
Physics: Heat	159
Physical Laboratory	160
German	74
English Composition	57
Options.	
Integral Calculus	23
Geology	362
Electricity	164
Sanitary Chemistry	138
Industrial Chemistry	139

SECOND TERM.	
Analytical Chemistry; Laboratory and Lectures	129
Theoretical Chemistry	128
Assaying	293
Industrial Chemistry	130
Physical Laboratory	160
German	74
English Composition	57
Business Law	124
Options.	
Electricity	165, 166
Geology	363
Sanitary Chemistry	138
Industrial Chemistry	139

FOURTH YEAR.

FIRST TERM.	
Organic Analysis	131
Abstracts.	
Organic Chemistry	134
Physical Laboratory	169
Metallurgy	295
Options.	
Physics.	
Language	75
Sanitary Chemistry	140
Textile Coloring	141
Laboratory Options.	
Analytical Laboratory	132
Organic Laboratory	136
Metallurgical Laboratory	297
Industrial Laboratory	137

SECOND TERM.	
Organic Chemistry	134
Gas Analysis	143
Thesis Work.	

VI. — ELECTRICAL ENGINEERING.

This course has been established in order to meet the wants 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 most branches of electrical engineering a sound knowledge of mechanics, motors, of measurements of power and its transmission, etc., is essential. Thus, through the second year the students follow mathematics, mechanism, shopwork, and drawing to about the same extent as 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 continues, 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 end of the third year. Work in the physical laboratory begins at the middle of the second year, and leads up to electrical measurements and testing. In the fourth year are given extended courses on the technical application of electricity to the telegraph, telephone, electric light, the electrical generation and transmission of power, etc. Electrical study and research occupy the principal position in the fourth year. A series of advanced mathematical topics forms an important part of the work of this year. (See pages 62, 70–72, 84.)

VI. — ELECTRICAL ENGINEERING.

FIRST YEAR COMMON TO ALL COURSES. SEE PAGE 23.

SECOND YEAR.

FIRST TERM.

	Number
Physics	155
Acoustics	157
Analytic Geometry	20
Descriptive Geometry	52
Principles of Mechanism	240
Carpentry and Metal-turning	263, 268
Political Economy	95
German	73

SECOND TERM.

	Number
Physics	155
Physical Laboratory	158
Acoustics and Electricity	157
Differential Calculus	22
Mechanism	246
Drawing	244
Carpentry and Wood-turning	263
English Literature	56
German	73

THIRD YEAR.

FIRST TERM.

Physics: Heat	159
Physical Laboratory	162
Electricity	164
Integral Calculus	23
General Statics	41
Steam Engineering: Valve Gears, Thermodynamics	248
Drawing	251
English Composition	57
German	74

SECOND TERM.

Physical Lab.: Heat, Electricity	162
Electricity	165, 166
Strength of Materials, Kinematics, and Dynamics	42
Steam Engineering	248
Engineering Laboratory	253
Drawing	251
English Composition	57
Business Law	124
German	74

FOURTH YEAR.

FIRST TERM.

Technical Applications of Electricity to Telegraph, Telephone, Electric Lighting, etc.	179
Phys. Lab.: Electrical Testing	170
Testing of Telegraph Lines, Dynamo-Machines, etc.	180, 182
Advanced Physics: Memoirs, etc.	168
Photometry	183
Method of Least Squares	30
Steam Engineering	254
Dynamics of Machines	256
Engineering Laboratory	259
Strength of Materials, Friction	45
Hydraulics	213

SECOND TERM.

Technical Applications of Electricity	179
Advanced Physics, Memoirs, etc.	168
Physical Research.	
Differential Equations	29
Engineering Laboratory	259
Discussion of the Precision of Measurements	178

Options.

1. Quaternions	31
2. Physical Laboratory	170
3. Theory of Potential	184

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

VII. — BIOLOGY.

The aim of this course is first, to afford a general education in the natural sciences, — physiology, zoölogy, botany, mineralogy, geology, etc., — and, second, professional training in biology, with special reference to medical studies and sanitary science. It is intended for those who wish to become biologists; for those who are preparing for medical studies; for those who wish to fit themselves for teachers of, or desire a general education in, the natural sciences.

The intimate relations existing between physics, chemistry, and biology on the one hand, and the medical and sanitary sciences — physiology, pathology, hygiene, etc. — on the other, make a course like this peculiarly valuable as a preparation for the scientific or professional study of medicine. To this end the student of biology is made familiar, not only with the elements of physics, chemistry, and microscopy, but also with the comparative anatomy and physiology of the lower animals, especially vertebrates, and with sanitary biology. (See page 86.)

Abundant opportunities are provided for practical studies in the biological, geological, and mineralogical laboratories (see page 87); while advantages somewhat unusual are offered by the library and museum of the Boston Society of Natural History. (See page 88.)

Special facilities are offered for work in sanitary biology, including the study of the organisms affecting water supply, sewage disposal, and public hygiene.

VII.—BIOLOGY.

FIRST YEAR COMMON TO ALL COURSES. SEE PAGE 23.

SECOND YEAR.

FIRST TERM.	Number
Physics	155
Analytical Chemistry (Qualitative)	126
General Biology	380
Political Economy	95
German	73
Zoölogy	385
Analytic Geometry (Brief Course)	21

Those who cannot show that they have already enough proficiency in Latin to satisfy the department, must devote considerable time to that subject during this term.

SECOND TERM.	Number
Physics	155
English Literature	56
Physical Geography	360
German	73
Biology of Micro-organisms / Elementary Botany	382
Zoölogy	385
Analytical Chemistry	126
Mineralogy and Blowpipe	291

THIRD YEAR.

FIRST TERM.	
Comparative Anatomy	383
Structural and Chemical Geology	362
Physics: Heat	159
Physical Laboratory	160
English Composition	57
German	74
Cryptogamic Botany	386
Anthropology	393
Organic Chemistry	135

SECOND TERM.	
Comparative Embryology	383
Historical Geology	363
Physical Laboratory	160
English Composition	57
Business Law	124
German	74
Sociology	115
Sanitary Chemistry	138

FOURTH YEAR.

FIRST TERM.	
Comparative Physiology	387
Microscopic Anatomy	388
History of Natural Science	394
Climatology	365
Sanitary Biology	395
Higher Biology	391
History of the Renaissance	87
Journal Club.	

SECOND TERM.	
Comparative Physiology	387
Microscopic Anatomy	388
Bacteriology and Public Hygiene	396
History of the Renaissance	87
Lectures on Teaching (optional)	392
Journals.	
Thesis Work.	

VIII. — PHYSICS.

As distinguished from the professional or technical courses in Engineering, Architecture, etc., there are offered by the Institute certain courses of a purely 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, but 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 continue 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 by 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.

VIII.—PHYSICS.

FIRST YEAR COMMON TO ALL COURSES. SEE PAGE 23.

SECOND YEAR.

FIRST TERM.

	Number
Physics	155
Acoustics	157
Analytic Geometry	20
Analytical Chemistry	126
Theoretical Chemistry	127
Descriptive Astronomy	156
Political Economy	95
German	73

SECOND TERM.

	Number
Physics	155
Physical Laboratory	158
Acoustics and Electricity	157
Differential Calculus	22
Microscopy	381
English Literature	56
German	73

Options.

1. Chemistry.	126
2. {General Theory of Equations	24
{Determinants	25

THIRD YEAR.

FIRST TERM.

Physics: Heat	159
Physical Laboratory	160
Optics or Electricity	164, 167
Integral Calculus	23
General Statics	41
Physical Laboratory	161
Organic Chemistry	135
English Composition	57
German	74
Physiology of the Senses	384
or Shopwork	263

Options.

1. Chemistry.	
2. Analytic Geometry of Three Dimensions, or Advanced Algebra and Trigonometry	27 26

SECOND TERM.

Physical Laboratory: Heat, Electricity	161
Optics, Electricity, or Heat	165, 166, 167
Strength of Materials, Kinematics, and Dynamics	42
Theoretical Chemistry	128
English Composition	57
Business Law	124
German	74

Options.

1. Chemistry.	
2. Advanced Calculus or Quaternions	28, 31
3. Physics	161

FOURTH YEAR.

FIRST TERM.

Physical Laboratory	170
General Physics	177
Advanced Physics: Memoirs, etc.	168
Principles of Scientific Investigation	176
History of Physical Science	175
Photography.	
Photometry	183
Thermodynamics	248
Method of Least Squares	30

Options.

1. Chemistry.	
2. Advanced Algebra and Trigonometry, or Analytic Geometry of Three Dimensions	26 27

SECOND TERM.

Physical Research.	
General Physics	177
Advanced Physics: Memoirs, etc.	168
Differential Equations	29
Discussion of the Precision of Measurements	178

Options.

1. Physiological Measurements.	
2. Quaternions or Advanced Calculus and Definite Integrals	31 28
3. Theory of Potential	184
4. Physical Research.	

IX.—GENERAL STUDIES.

This course is designed to meet, as far as possible, the needs of an increasing class of students who desire a general scientific education, or who expect to engage in some branch of commerce, in the administration of public or private trusts, in banking, in journalism, in manufacturing, or other business enterprises. It is accordingly somewhat less technical in its studies than the other courses of the school, though not less exacting in its requirements or less thorough in its educational discipline.

It will be noticed that natural science makes a considerable demand upon the time and attention of the student. He is required to study chemistry one year; physics, one year; structural and historical geology, one year; general biology and zoölogy, one year; and each of the following subjects one-half year: namely, physical geography, climatology, descriptive astronomy, the history of the natural sciences, anthropology, physiology, and sanitary science. Optional courses permit the student to devote additional time to these subjects. In brief, the studies of this course have been arranged with a view to securing an education primarily through scientific study and experiment, yet with a larger amount of philosophical study in history, economics, language, and literature than is possible with the technical requirements of the other courses.

The special opportunities offered by the department of General Studies are: the more extended study of French and German; a continuous course of historical study, directed especially towards the political and social history of England and the United States; a more thorough acquaintance with English literature and with the models of style; an orderly study of economics, including its theory and history, with courses in industrial and commercial history and geography, finance and statistics; investigations in social and political science, founded, in sequence of study, upon the courses in biology and directing especial attention to the origin and development of institutions.

(See pages 64 and 66.)

IX.—GENERAL STUDIES.

FIRST YEAR COMMON TO ALL COURSES. SEE PAGE 23.

SECOND YEAR.

FIRST TERM.	Number
Physics	155
German. French	73, 71
Political History of England and the United States	86
Political Economy	95
Shopwork	263
Analytic Geometry (Brief Course)	21
General Biology and Zoölogy	380, 385

SECOND TERM.	Number
Physics	155
German. French	73, 71
Political History of England and the United States	86
Economic Problems	96
English Literature	56
Physical Geography	360
Botany and Zoölogy	382, 385

THIRD YEAR.

FIRST TERM.	
Physics: Heat	159
French. German	72, 74
History and Literature of the Renaissance and the Reformation	87
Statistics	105
Financial History of the U. S.	97
Structural Geology	361
English Composition	57
Commercial Geography	98
Anthropology	393
Options.	
1. History of Architecture	321
2. Shop-work: Forging	265
3. Physical Laboratory	160
4. English Literature	58

SECOND TERM.	
French. German	72, 74
Sociology	115
*History of Commerce or of Industry	99
History and Literature of the Renaissance and the Reformation	87
Historical Geology	363
Business Law	124
Options.	
1. History: England in the 16th and 17th Centuries.	
2. *Political Science: Theories of Socialism, Communism, Co-operation, and Profit-sharing	100
3. Physical Laboratory	160
4. Elizabethan Literature	59

FOURTH YEAR.

FIRST TERM.	
German	75
Comparative Politics	116
Physiology.	
Taxation. Administration	102, 103
Logic	62
History of Philosophy	89
English Literature	60
Descriptive Astronomy	156
Climatology	365
History of Natural Science	394
Options.	
1. History: The Era of the French Revolution.	
2. Political Science: Stat. of Sociology	106
3. Language	75
4. Literature: The 17th Century.	

SECOND TERM.	
Advanced German	75
International Law	117
Constitutional History	88
*History of Commerce or of Industry	99
Banking and Finance	107
History of Economic Theory	104
Public Hygiene	390
Thesis Work.	
Options.	
1. History: The Era of the French Revolution.	
2. *Political Science: European Systems of Administration.	
3. Language	75
4. Literature	61

* These studies alternate from year to year.

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 wishes to 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.

X.—CHEMICAL ENGINEERING.

FIRST YEAR COMMON TO ALL COURSES. SEE PAGE 23.

SECOND YEAR.

FIRST TERM.	Number
Principles of Mechanism	240
Analytic Geometry	20
Descriptive Geometry	52
Physics	155
Analytical Chemistry	126
German	73

SECOND TERM.	Number
Construction of Gear-teeth Mechanism of Cotton Machinery Mechanism of Machine Tools	245
Drawing	242
Differential Calculus	22
Physics	155
German	73
English Literature	56
Analytical Chemistry	126

THIRD YEAR.

FIRST TERM.	
Steam Engineering: Thermodynamics: Valve Gears	248
Integral Calculus	23
General Statics	41
Physics: Heat	159
Physical Laboratory	160
German	74
Drawing	252
Industrial Chemistry	130
English Composition	57
Elements of Organic Chemistry	135

SECOND TERM.	
Steam Engineering: Boilers	248
Drawing	252
Engineering Laboratory	253
Strength of Materials, Kinematics, and Dynamics	42
Physical Laboratory	160
German	74
Industrial Chemistry: Lectures	130
Industrial Chemistry: Laboratory	139
English Composition	57
Business Law	124

FOURTH YEAR.

FIRST TERM.	
Steam Engineering	254
Dynamics of Machines	256
Engineering Laboratory	259
Strength of Materials, Friction	45
Metallurgy	295
Political Economy	95
Applied Chemistry: Lectures and Laboratory	142 137
Gas Analysis	143
Shopwork	263
Options	
Textile Coloring	141
Heat Measurements	171
Organic Chemistry	134
Hydraulics	213
Hydraulic Measurements	218

SECOND TERM.	
Engineering Laboratory	259
Strength and Stability of Structures; Theory of Elasticity	47
Technical Machinery	269
Shopwork	265
Applied Chemistry: Thesis. Memoirs.	
Options.	
Metallurgy	299
Thermo-Chemistry and Fuel Examination	128
Organic Chemistry	134
Hydraulic Motors	216

XI.—SANITARY ENGINEERING.

This course is essentially one in Civil Engineering, but is designed for students who wish to pay particular attention to those engineering branches 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 24, 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 properly to interpret the results of 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 for 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 of Civil Engineering, a portion of which is there optional with other studies, is required in the course in Sanitary Engineering.

XI.—SANITARY ENGINEERING.

First Year common to all Courses. See page 23.

SECOND YEAR.

FIRST TERM.	Number
Surveying and Plotting	200
Topographical Drawing	203
Descriptive Geometry	52
Analytic Geometry	20
Physics	155
Political Economy	95
German	73
Organic Chemistry	135

SECOND TERM.	Number
Surveying and Plotting	200
Differential Calculus	22
Physics	155
Physical Geography	360
English Literature	56
German	73
Analytical Chemistry	126

THIRD YEAR.

FIRST TERM.	
Railroad Engineering, with Field-work and Drawing	207, 209
Stereotomy	212
Advanced Surveying	204
Integral Calculus	23
General Statics	41
Physics: Heat	159
Physical Laboratory	160
Structural Geology	361
German	74
English Composition	57
Analytical Chemistry	129
General Biology	380

SECOND TERM.	
Railroad Engineering, with Field-work and Drawing	207, 209
Advanced Surveying	204
Elements of Construction	219
Elementary Design	220
Physical Laboratory	160
German	74
Strength of Materials, Kinematics and Dynamics	42
Water Analysis	138
Biology of Microörganisms	382

FOURTH YEAR.

FIRST TERM.	
Theory of Structures	221
Bridges and Roofs	222
Hydraulics	213
Sanitary Field-work and Hydraulic Measurements	218
Strength of Materials, Theory of Elasticity	44
Sanitary Engineering	214
Bridge Design	223
Air Analysis.	
Sanitary Biology	395
Heating and Ventilation	185

SECOND TERM.	
Theory of Structures	221
Bridges and Roofs	222
English Composition	57
Business Law	124
Thesis Work.	
Hydraulic Engineering	217
Engineering Design	215
Chemistry of Natural Waters.	
Theories of Water Filtration and Sewage Disposal.	
Sanitary Bacteriology	396
Building Construction.	
Public Hygiene	390

XII. — GEOLOGY.

The course affords an opportunity to obtain a general education in natural science with a special training in geological work and studies. The occupations which its students may naturally have in view include responsible positions upon local, State, or national surveys, practice as professional geologists in any of the economic or technical relations of the science, or official 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 both topographically represent and geologically interpret the physical features of a country. With the intention of educating men 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 accordingly added the construction of geologic maps and sections, physiographic geology and hydrography with field-practice.

The studies economic geology, ore-deposits, mineralogy and lithology, chemistry and assaying, together with the mining and metallurgy which may be elected, are intended to prepare the student to apply his geological knowledge to regions of mineral wealth and their development.

It is recognized that there is a class of students seeking a geological course who for good reasons desire an association of studies differing somewhat from the schedule printed. This class includes, among others, women who are preparing to teach and naturally do not wish so much study and practice in surveying, but perhaps desire more zoölogy, paleontology, or other studies. It is expected that they will make their wants known to the department, and that the Faculty will consider each request upon its individual merits.

For details of instruction and equipment see pages 88–90.

XII. — GEOLOGY.

FIRST YEAR COMMON TO ALL COURSES. SEE PAGE 23.

SECOND YEAR.

FIRST TERM.		SECOND TERM.	
Analytic Geometry	20	German	73
German	73	English Literature	56
Political Economy	95	Physics	155
Physics	155	Surveying	200
Surveying and Drawing	200	Mineralogy	366
Analytical Chemistry	126	Physical Geography	360
Theoretical Chemistry	127	Analytical Chemistry	126

THIRD YEAR.

FIRST TERM.		SECOND TERM.	
German	74	German	74
English Composition	57	English Composition	57
Physics: Heat	159	Business Law	124
Physical Laboratory	160	Physical Laboratory	160
Topographical Surveying	204	Topographical Surveying	204
Structural and Chemical Geology	362	Historical Geology	363
Geological Field-work	368	Mineralogy	367
Analytical Chemistry	129	Geological Maps and Sections	369
General Biology	380	Analytical Chemistry	129
Zoölogy	385	Systematic Botany	398
Paleontology	374	Zoölogy	385
		Paleontology	374

SUMMER SCHOOL OF GEOLOGY AND TOPOGRAPHY.

FOURTH YEAR.

FIRST TERM.		SECOND TERM.	
Physiographic Geology (including Orography)	371	Hydrography (including Tidal Phenomena)	372
Economic Geology	376	Economic Geology	376
Micro-Lithology	378	Ore-Deposits	377
Geological Field-work and Laboratory	370	Micro-Lithology	378
Climatology	365	Geological Field-work and Laboratory	370
Geodetic Surveying	205b	Assaying by Fire	293
Hydraulic Measurements	218	Geological Memoirs	373
Geological Memoirs	373	Thesis Work.	
Options.			
1. Paleontology (including Osteology)	375		
2. { Mining Engineering	292		
2. { Metallurgy	295		

FIVE-YEAR REGULAR COURSES.

The foregoing schedules of the regular courses are arranged for the completion of the work in four years. It may occasionally happen 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 certain 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 will be in every way the same, and he will be classed as a regular student so long as he maintains his standing in the course which he is pursuing. A five-year course 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.

ADVANCED COURSES.

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

The degrees, Doctor of Philosophy and Doctor of Science, are awarded for proficiency in complete advanced 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 Bachelors of other institutions, who shall satisfy the Faculty, by examination or otherwise, that they are qualified to take with advantage the course proposed.

SPECIAL COURSES.

In general, no schedule for special courses of study is laid down; but special courses may be arranged in accordance with the Schedule of Topics, pages 95 to 115, subject, however, to the approval of the Faculty in all cases. Special opportunity for the pursuit of laboratory and lecture courses is afforded to teachers, and to persons of mature years engaged in technical pursuits. Special students in Chemistry must pass the regular entrance examinations. For exceptional requirements regarding special students in Architecture, see page 32.

REQUIREMENTS FOR GRADUATION.

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

To be entitled to a degree, the student must have passed satisfactory examinations in all the prescribed studies and exercises, and, in addition, a final or degree examination, embracing all the subjects which particularly relate 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 architectural design, accompanied by an explanatory memoir. This thesis or design must be submitted to the Faculty for approval three days before the first degree examination, unless the thesis or design be dependent on laboratory work, in which case it must be presented two days after the close of the respective laboratories.

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

Students leaving the school before graduation are entitled to receive an honorable dismission, if their record for conduct, attention to studies, and scholarship is satisfactory to the Faculty.

REQUIREMENTS FOR ADMISSION.

Time of Examination for Admission. — A first examination for admission to the first-year class will be held in the Rogers Building, 187 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 examinations, will begin at 9 A. M., on the first Tuesday after September 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 advance, and will be mailed on application.

Candidates who intend to be examined in any other place than Boston are required to send their names to the Secretary in time for him to receive them by June 15th. A fee of five dollars is to be paid in advance by every candidate who is examined at any place other 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.

For detailed information, address the Secretary.

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 59), and must present themselves for further examination (see page 59) at 9 A. M., on the Wednesday preceding the second entrance examination. (See Calendar, page 2.)

Applications for admission at other times 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 all such examinations held at other times than those above specified.

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 are specified as a minimum, and only very 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 superfluous.

The requirements in the various subjects are as follows:

1. *Arithmetic.* — Prime and composite numbers; greatest common divisor and least common multiple; ratio and proportion; common and decimal fractions; percentage; simple and compound interest; compound numbers; metric system of weights and measures; square root. 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 equations containing radicals; quadratic equations; equations in the quadratic form; simultaneous quadratic equations; theory of quadratic equations; ratio and proportion; arithmetical progression; geometrical progression; binomial theorem, with proof for a positive integral exponent. A satisfactory treatment of the topics in algebra may be found in any of the following text-books: Wells's Academic Algebra, Wentworth's Elementary Algebra, or Todhunter's Algebra for Beginners.

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.

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 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) The candidate must have read not less than one hundred and fifty duodecimo pages of easy German (of which one hundred and twenty-five must be prose), from not less than 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 will give this important subject all due attention. Candidates capable of passing in both French and German at the entrance examination will find this advantageous for their subsequent work at the Institute.

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, a short English composition, — correct in spelling, punctuation, grammar, idiom, and division into paragraphs, and plain and natural in style, — on some subject already familiar to him. 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.[1]

For 1891: Shakspeare's Julius Cæsar, Longfellow's Evangeline, Macaulay's Essay on Lord Clive, Webster's first Bunker Hill Oration, Irving's Alhambra, Scott's Old Mortality, George Eliot's Silas Marner.

For 1892: Shakspeare's Julius Cæsar, Scott's Marmion, Longfellow's Courtship of Miles Standish, Addison's Sir Roger de Coverley Papers, Macaulay's second Essay on the

[1] 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.

Earl of Chatham, Webster's first Bunker Hill Oration, Irving's Alhambra, Scott's Talisman.

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' David Copperfield.

(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 (Boston: D. C. Heath & Co., 1888) is recommended as a good text-book to 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, Alexander Johnston's History of the United States, and Myers and Allen's Outlines of Ancient History are recommended, though not prescribed.

7. *Geography.* — The text-books in common use fairly represent the amount of preparation required. A knowledge of the geography of the United States and Europe is especially important. To have been familiar with geography at some previous time is not sufficient, but a systematic review of the whole is an essential part of an adequate preparation for certain studies which are included in all the Institute courses. Practice in freehand map-drawing from memory is strongly recommended.

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 53. For the first divided examination, the candidate will be allowed the choice of any of the following nine subjects, but he must take at least six. No credit will be allowed on any of these unless at least five of the six taken are satisfactorily passed. At the second examination, all subjects not passed at the first must be taken.

To be admitted to the first divided examination, the candidate must be at least sixteen years of age, and must have notified the Secretary of the Faculty, at least two weeks before the date fixed for the examination, of his intention to apply. This notification must be accompanied by a list of the six subjects in which he will submit himself, and by a certificate from his teacher stating that he is qualified in them.

I. Arithmetic (without Metric System).
II. Metric System.
III. Algebra (to Quadratics).
IV. Advanced Algebra (completion of requirements stated on p. 54).
V. Plane Geometry.
VI. French (or German, see page 55).
VII. English Language and Literature.
VIII. History.
IX. Geography.

NOTE. — The applicant may take Solid Geometry, as stated on page 55. Details of the above requirements are given on pages 54 to 57.

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.

Students will find their progress in Physics and Chemistry promoted by making themselves thoroughly familiar with so much of Physics as is contained in Balfour Stewart's Primer.

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 also be borne in mind by pupils purposing to enter the Institute that the broader the intellectual training of the student in any direction, and the more extensive his general acquirements, the greater 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 proper 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 53. (See pages 53 to 58, and pages 23 to 49.)

Graduates of colleges are admitted to the Institute without 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 the third 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 will be received provisionally as regular students. The attention of such applicants is particularly called to the schedules of courses on pages 23 to 49, and to the schedule of topics on pages 93 to 115. It is highly desirable that students contemplating professional courses after graduation from college shall arrange their college electives to cover the earlier subjects of the chosen course, in order that the number of deficiencies to be made up may be as small as possible; and

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 any 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 TO SPECIAL COURSES.

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

By means of the schedule of topics and requirements as given at pages 93 to 115, 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. 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.

Methods and Apparatus of Instruction.

Ordinary Exercises. — 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.

Written Examinations. — 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. The examinations of January and May form the basis of admonition or advice from the Faculty in the case of students who are not profiting by their connection with the school.

The Instruction in 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 95.)

The four topics following are taken by all regular students: Solid and Spherical Geometry; Higher Algebra; Logarithms and Plane and Spherical 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.)

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; Determinants.

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; 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.

The Instruction in Descriptive Geometry. — 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 such problems as shall illustrate the work of the class-room, and make him thoroughly familiar with this subject.

The Instruction in Drawing. — 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 necessary skill, and to prepare him for his future work. Drawing is also continued in connection with the professional studies.

The Instruction in 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 particular 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 55) 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, both optional and required. Instruction in the elements of Italian and Spanish is also offered.

The Instruction in English. — All regular students receive instruction in English during the first three 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 in person 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 the first term of the second year, by the courtesy of the 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. In the second term of 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. In the third or fourth year, according to the requirement of the particular course to which the student belongs, an advanced course in English composition is given, in which is required the frequent writing of essays and reports on subjects connected more or less closely with the student's present or future professional work. These essays are discussed, and criticised at length, and, if necessary, rewritten. The aim of the department is to give students fitting for 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 1580, Argumentative Composition, and, if desired, philological work in Old and Middle English. The aim in view is to give a student thorough drill, according to modern methods, in the literary history of the periods mentioned.

The Instruction in History and Political Science. — Instruction is given to all regular students in the following subjects: Contemporary Political History, with some reference to Geography, and with individual examination of current discussions in periodical literature; Mediæval and Modern European History, including a view of the Mediæval Papacy and Empire, the Free Cities, the development of European Literature from Dante to Lessing, the history of educational theory down to Pestalozzi, and the rise of Universities; English and American Constitutional History; Political Economy.

Further instruction is offered in the following topics: The history of politics and social institutions in England and

the United States; Anthropology, the study of prehistoric man, life in the Stone Age, fetichism, totemism, and the rudiments of a social organism; Sociology, the historical development of the family, the organization of State and Church, and problems of ethnology; Comparative Politics, including a presentation of the opinions of dominant political thinkers, as Plato, Aristotle, Machiavelli, Hobbes, and modern philosophers; International Law, the intercourse between separate States, studied in the light of the foreign relations of the United States; Financial and Tariff History of the United States, with special reference to the relation of the tariff to important industries, investigation being made in the public documents of the United States Government for the authority of statements; History of Industry, including guilds, trades-unions, factory-system, strikes, arbitration, labor statistics; History of Commerce; Banking and Finance, including municipal finance; History of Economic Theory, with a survey of the mercantilists and physiocrats, and the modern schools; Statistics, including graphic representations by diagrams and cartograms; Administration, National and Municipal, with the consideration of the organization of departments, tenure of office, official responsibility, and the civil service.

In addition, six optional courses during the last three terms afford opportunities for the more complete study of these subjects.

Students in these courses have the benefit of a special reading-room, provided with current periodicals devoted to history and political science, economics, statistics, and literature. In connection with the reading-room, there is a departmental library relative to these subjects, and accessible to all. Special investigations are here made, under the personal supervision of the instructor in charge. The library is made the student's text-book, instruction being given by the topical method, by lecture and reference, and the exclusive use of single text-books is avoided.

Drawing-tables and chart-paper and other necessary ap-

pliances are furnished to all students engaged in statistical work.

The latter also have access, under proper restrictions, to the library of the American Statistical Association, which is kept in the rooms of the department.

The Instruction in 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 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 in Inorganic Chemistry, the elements 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 by more advanced courses of 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, 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 if they desire it. 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.

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 cotton,

wool, and silk in the piece and in yarn. The students are taught how to use mordants, and to perform the common operations of the dye-house. 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 dye-stuffs present upon fibres are taught, together with many of the modern methods of commercial analysis. 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 consists of lectures and 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. These special students are required to study French and German as a part of their course, and are subject to the same examinations in the branches which they pursue as are the regular students. In addition, the Institute desires to make available all the facilities of the lecture-rooms and laboratories to teachers who wish to perfect themselves in chemistry, and to persons of maturer years who are engaged in technical pursuits, and who wish to acquire an accurate knowledge of the science. Such persons may be admitted, without formal examinations,

on satisfying the Faculty that they are competent to pursue to advantage the subjects chosen.

The Kidder Laboratories of Chemistry afford accommodations for five hundred and fifty students. The chemical department occupies fifteen laboratories, two lecture-rooms, a reading-room and library, balance-room, offices, and supply-rooms, —in all, twenty-five rooms. The laboratory for general chemistry has places for three hundred and twenty 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 laboratory has 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 individual, so that the student 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 printing machine designed for experimental purposes. 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 is a small lecture-room, seating thirty. The lecture-rooms contain valuable cabinets of

specimens for purposes of illustration. The balance-room is supplied with twenty-two balances.

The William Ripley Nichols Library of Chemistry, numbering more than forty-two hundred 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. It is primarily designed to aid in the instruction, but is open to all persons who desire to consult it.

The Instruction in Physics. — This begins with a series of lectures, attended by all regular students, in which the whole subject of Physics 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. 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 and allied subjects has been instituted, and the course in general Electrical Measurements is undergoing continual extension.

The Rogers Laboratory of Physics. — Regular students, excepting those in Course IV., 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 mathemati-

cal 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. To this succeed 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 for.

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.

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 carried on. 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, and new publications of value on that subject 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.

The Instruction in Theoretical and Applied Mechanics begins with the study of 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 part of this instruction embraces the completion of the study of Strength of Materials, including work in the Engineering Laboratories, Theory of Elasticity, main principles of the Stability of Arches and Domes, and special study of Dynamics.

The methods of the differential and integral calculus are freely used whenever they are the most convenient.

The Instruction in Civil Engineering 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, covering 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 course in the second year includes the use of the chain, tape, compass, transit, and level, as well as of the various pocket instruments. The course in the third year includes the use of the stadia, sextant, solar compass, and plane table.

The course in Railroad Engineering includes 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, is 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 are discussed the economics of railroad location, and also the subjects of rolling stock, motive power, train resistance, brakes,

signals, yards, stations, tunnels, and street railways of various kinds; and also a course on railroad administration and management.

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. A. A. Pope, of Boston, the facilities for instruction in this branch will be gradually extended, and the equipment of the department, in the way of books, models, and drawings, will be increased. Provision will also be made for testing the quality of road materials.

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, foundations, coast and harbor work, and irrigation. In this course the object is to make the student familiar with the principles involved, and to give him a foundation on which he can afterward safely base his more extended practical studies. Special attention is given in this course to the subjects of hydrology, water-supply, water-power, and foundations.

The instruction in Sanitary Engineering is given by a course of lectures, supplemented by field-work and design. The object sought is to prepare the student to deal intelligently with certain questions relating to the health of in-

dividuals 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 by surface or sub-surface irrigation for isolated buildings, the collection and removal of sewage in the larger towns, and the sanitary drainage of cities. Frequent opportunities are given to the student for the inspection of actual examples of sanitary engineering, and a study is made of the questions of the day in relation to public health. Students taking this course also attend lectures and laboratory exercises on Bacteriology.

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 consists in 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. 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, in addition, further study is devoted to this subject in connection with the other courses, each material being taken up in connection with the structures in which it is most extensively applied. The study of Specifications and Contracts is also taken up in connection with each of the special courses, and some actual specifications are studied, each in its proper place.

The course in Geodesy and Practical Astronomy includes the study of descriptive, spherical, and practical astronomy, and of the mathematical and physical principles of geodesy, with practice in some of the simpler geodetic field operations. In the summer vacation following the third year, stu-

dents taking the topographical 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 course is held at some convenient and suitable point in the country, and its object is to give the students opportunity for more extended and more 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. James T. Furber, General Manager of the Boston and Maine Railroad, and of Mr. Charles F. Choate, President of the Old Colony Railroad, the classes are frequently able 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 specially familiar. During the past year lectures were given by Mr. George W. Blodgett, Electrician of the Boston & Albany Railroad, on the Application of Electricity to Railway Working ; by Mr. C. W. Folsom, of the Boston Sewer Department, on some details of Sewer Work ; and by Mr. Henry B. Wood, of the Boston Sewer Department, on Stadia Surveying.

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; an instrument for measuring the strain in bridges and other structures of iron, which gives a continuous record. The 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 growing 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, Theory of Elasticity, with special reference to its applications to the strength of materials, and experimental work in the engineering laboratories.

The Instruction in Mechanical Engineering is given by means of lectures and recitations, and by practice in the drawing-rooms and in the engineering laboratories. Frequent visits are made also to machine-shops and manufacturing establishments, to witness machinery in operation and manufacturing processes, in addition to those which can be seen at the Institute itself.

The laboratory work, in its earlier portions, is devoted to giving the student a drill in such experimental work as a mechanical engineer is constantly called upon to perform, such as boiler and engine tests, etc. The later laboratory 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.

A large amount of drawing is done by the students throughout their course in connection with their regular work, draw-

ing for mere practice ceasing at the end of the first year. A definite style is adopted, and is adhered to throughout. Early in their course the students are taught to use the "blue process."

Besides the teaching by the regular corps of instructors, lectures upon special subjects are given by gentlemen actively engaged in the profession. During the last school year lectures were given by Mr. J. J. Woodward, Constructor, U. S. Navy, on Naval Construction; Mr. Joseph Stone, on Mill Management; Mr. James N. Lauder, of the Old Colony Railroad, on the Locomotive; Mr. David L. Barnes, on Compound Locomotives; and Mr. Richard Borden, of Fall River, on Cotton Mills.

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 they are called upon to perform in the pursuit of their profession; second, to give the students 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 × 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 strength, twist, and deflection of shafting while running and under the conditions of practice; machines for time tests of the transverse strength and deflection of full-sized beams; 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.

The hydraulic laboratory contains, — A closed tank five feet in diameter and twenty-seven feet high, connected with a stand-pipe ten inches in diameter and about ninety feet high; apparatus, in connection with the tank and stand-pipe, for making experiments on the flow of water through orifices and mouthpieces, over weirs and in pipes, under different heads and under different conditions, and on the losses of head occurring under different circumstances; a six-inch Swain turbine so arranged that it can be run under different heads, and that measurements can be made of the power exerted, of the efficiency, etc., under different gates.

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 was built by E. P. Allis & Co. It has a capacity of about 150 horse-power when running triple, with an initial pressure of 150 lbs., in the high pressure cylinder. It is connected with a surface-condenser and all 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 also 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 also 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 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 also available for the purposes of experiment in connection with the work of these laboratories, a horizontal tubular boiler, and two large Babcock & Wilcox 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.

The Instruction in 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 in the building 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, 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 18 hand-lathes of recent approved pat-

terns, 2 machine-drills, 2 planers, a shaping-machine, a universal milling-machine, a grinding-lathe, and 32 vise-benches arranged for instruction in vise-work.

The Cummings Mining and Metallurgical Laboratories. — The aim of these laboratories is to furnish students the means for the experimental study of various processes of ore-dressing and smelting, and at the same time to enable them to gain an idea of what is required of a miner or metallurgist. To this end the apparatus has been chosen with a view of illustrating, as far as possible, the principles of the more important machines and furnaces which are 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, and determines its character and value by analysis and assays, 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, each of whom has an opportunity in turn to manage the machines and furnaces.

The Institute does not claim that the instruction given in this laboratory is in any sense a substitute for the experience gained in large works. What is claimed is, that it prepares

students to go into works and to be 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 the books, is of great advantage to the student.

The mining laboratory consists of three parts, — milling-room, furnace-room, and assay-room, with supply-room and ample storage-vaults.

The milling-room is supplied with four suites of milling-apparatus, as follows: a three-stamp battery, a set of amalgamating-plates, a mercury-saver, a Frue-vanner for concentrating tailings, a settling tank, and a centrifugal pump; a Blake challenge crusher, crushing-rolls with automatic, sizing screens, a Richards-Coggin separator, a spitzlutte, a spitzkasten, two Harz-Mountain jigs, a circular slime-table, a settling tank, and a centrifugal pump; a set of four amalgamating pans, 30, 18, 12, and 8 inches in diameter respectively; also a 36-inch settler, and a little 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, and four Morrell agate mortars.

The furnace-room contains a water-jacket blast-furnace, a copper-refining furnace, a reverberatory lead-smelting or agglomerating furnace, two roasting furnaces, a roasting kiln, furnaces for cupellation, furnaces for fusion, a blacksmith's forge, a melting-kettle, retorts, etc. The assay-room contains ten crucible furnaces, 12 × 12, all of which are jacketed with iron shells to insure good draught, stability, and durability; also two muffles 4 × 7, one muffle 3 × 6, four muffles 7 × 12, one muffle 8 × 15. These furnaces are all provided with ample flue capacity and abundant draught. This room contains also six pulp-balances, six flux-balances, five 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. Since the year 1870, these schools have made studies in Colorado, Michigan, Virginia, Vermont, Pennsylvania, Lake Champlain, New Brunswick, and Nova Scotia. During the summer of 1888, the school of mining, of six weeks' duration, was located at the copper mines at Capelton, Canada. The students surveyed, laid tracks, drilled, and blasted below ground; and they sorted ore, assayed, and made a geological survey on the surface.

In June, 1889, the summer school in Metallurgy was given among the anthracite iron furnaces of the Lehigh Valley and the coke furnaces of Lebanon, Steelton, and Baltimore. The construction and running of furnaces were studied, also the starting up of furnaces after the Susquehanna flood.

In 1890, the summer school of Mining was at the iron mines at Ishpeming, Michigan, where a party of twelve spent a month at work, mining, setting timbers, and surveying underground, as well as making a geological survey on the surface.

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

The Instruction in Architecture. — The instruction in this subject 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 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, which fix in the memory the principles already learned, and supplement them by more advanced instruction.

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 evening 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.

The Architectural Museum. — Several thousand photographs, prints, drawings, and casts were originally collected for this 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 them at all times ; and as the Museum building is close at hand, no inconvenience results from the change ; and the regular exercises in drawing from the cast are held there. The space thus gained at the Institute is filled with specimens of metal-work, tile-work, glass-work, and wood-work, partly purchased, but mostly deposited with the department by the manufacturers, forming a museum of sanitary and building appliances. The library of this department contains a collection of technical 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 Instruction in Electrical Engineering. — As a foundation for subsequent work, instruction is given in the theory of electricity. A 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 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 the later part of the course each student prepares and reads before his class an essay on some electrical process, instrument, or system, or other professional 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. The work is also of particular advantage to those who intend to become teachers.

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 gentlemen: —

Mr. George W. Blodgett, Electrician of the Boston & Albany Railroad, on the Application of Electricity to Rail-

way Signalling, and on the Electric Lighting of Railway Trains; Mr. A. C. White, late of the Western Edison Electric Light Co., on Methods of Wiring for the Distribution of Electricity; Mr. Henry W. Blake, of the Sprague Electric Railway and Power Co., on Electro-Motors; Mr. C. J. H. Woodbury, of the Manufacturers' Mutual Fire Insurance Co., on Electric Lighting in its Relation to Fires and Fire Insurance; Mr. J. Rayner Edmands, of the Harvard College Observatory, on the Electrical Distribution of Time; Mr. C. A. George, of the Boston Municipal Fire Alarm Telegraph, on Municipal Fire Alarm Systems; Mr. C. L. Edgar, Superintendent of the Boston Edison Electric Illuminating Co., on the Edison System of Electric Lighting; Mr. G. F. Curtiss, of the Thomson-Houston Electric Co., on the Thomson-Houston System; Mr. Ralph Vose, of the Shaefer Electric Lighting Co., on the Manufacture of Incandescent Lamps; Mr. W. S. Moody, of the Thomson Electric Welding Co., on Electro-Magnetic Transformers; Mr. E. H. Hewins, of the New England Weston Electric Light Co., on Electric Light Specifications; and Sergt. Parke Morrill, of the United States Signal Service, on Atmospheric Electricity.

The equipment of the laboratory includes a number of dynamo machines of various patterns, both arc and incandescent, which are 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 Co. A 500-light Thomson-Houston alternating current machine, with convertors, has also been recently added to 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,

which, if the student so desires, may lead to the degree of Master of Science or Doctor of Philosophy. To this end, in addition to guidance in the prosecution of experimental research, provision will be made for the further study of the Mathematical Theory of Electricity, of Analytic and Applied Mechanics, including the Theory of Elasticity, the Dynamics of Rigid Bodies, and Hydrodynamics, and also of Advanced Mathematics.

The Instruction in Biology covers a series of related subjects, beginning with General Biology and Microscopy, and extending to special instruction in Comparative Physiology, Zoölogy, and Sanitary Biology.

General Biology is taught, partly as an introduction to the special branches of the subject, which are accordingly made to depend more or less upon it, and partly for its own sake, as opening up to the student of life-science a new and important field. 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 a distinct course in Microscopy is 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 introduces the student to Cryptogamic Botany, of which the outlines only are taught, and to Zoölogy (including Paleontology), in which larger opportunities are provided. The elements of Anatomy and Embryology are

taught by a course in Comparative Anatomy and Embryology, and in these subjects the arts of Dissection and Histology are necessarily acquired.

The instruction in Zoölogy is given by lectures and laboratory work, and by occasional visits to museums and to the seashore. Excursions are made every year to Wood's Holl (where are located the new 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, some choice of special work, and are expected to arrive at professional attainments in their specialties. The subjects offered at present are Comparative Physiology (including Microscopic Anatomy), Advanced Zoölogy, and Sanitary Biology. For supplying the needs of undergraduate students in either of these subjects the department of Biology is now well prepared, and some of the apparatus available is enumerated in the next paragraph. Attention is given to the new and rapidly developing science of Bacteriology, especially in its latest applications to sanitary science in the examination of air, ice, and water.

The organisms peculiar to, or important in, water-works are specially considered, owing to their practical significance, and to this end Sanitary Biology is made an important feature of the fourth year.

A biological journal club, to which the more advanced students are admitted, has been found helpful as a means of keeping abreast of current progress, and in 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 machines, a rotating drum for smoked paper, a pendulum myograph, a moist chamber, culture rooms, sterilizers, a thermostat, 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 one thousand volumes.

The Instruction in 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.

In the spring, several excursions are made to localities of mineralogical interest.

The Instruction in 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 practically 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 present 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 the 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 extensive, and 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 good general idea of the physical history of

the earth, and to teach some of the technical applications of this branch of knowledge. The students who are in the department of Civil Engineering constitute a distinct class. With these, especial attention is given to those events in the history of the earth which largely determined the 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 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 personal acquaintance with natural features and objects, and then trained to employ correct methods of interpretation and presentation. The collections are for use in teaching and not for exhibition, 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 order in which it is taken up in the Institute course.

The Instruction in 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 climates 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.

Instruction in 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 specially dealt with in a subsequent course of instruction, designed to consider materials, methods of transportation, evaporation and distillation, refrigeration, furnace construction, and similar topics, with special reference to the needs of the chemical industries. These special topics will be, so far as possible, taught by persons practically connected with the industries of which they treat. The machinery and mechanical appliances used in manufacturing chemistry are also discussed at length from a purely engineering point of view. 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 gas and illuminating gas. 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 such machines as it may contain. Particular attention will be paid to comparative tests of various means and appliances used in chemical manufactures. Excursions are frequently made to various shops and manufacturing establishments.

The Instruction in Military Science and Tactics. — In conformity with the requirements of the Act of Congress of July 2, 1862, and of the Act 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 measures and by contract, in order to secure uniformity of material and manu-

facture, as well as cheapness. The whole cost to each student does not exceed fifteen 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, when he has a surgeon's certificate of disability, or is able to pass (within thirty days after the opening of the term) an examination satisfactory to the department in both theoretical and practical tactics and drill.

The drill-hall includes a gymnasium, open to all students in the Institute.

Libraries. — The library of the Institute contains eighteen 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 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-one 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," 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 23 to 49; 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 taking 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 the subject; and in the tenth, the number of the preparatory subject or subjects required of any one 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 41 (Applied Mechanics) are 23 and 155; that for 23 is 22; that for 22 is 20; that for 20 is 18; those for 18 are 15 and 16; those for 15 and 16 are 1, 2, and 3 (the admission requirements in arithmetic, algebra, and plane geometry); that for 155 is 18, which has already

been followed through. So that, to take up the topic 41 in Applied Mechanics, the applicant must be prepared to pass, or must have passed examinations, in 15, 16, 18, 20, 22, 23, 155, and in 1, 2, and 3. The sufficient reason for this is, that in topic 41 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 in 245, Mechanism, the student must have completed 240, and also cannot take 245 unless he takes 22 at the same time, or has already completed it.

By a careful consideration of the schedule, in connection with the pages on the "Methods and Apparatus of Instruction" (61 to 92), 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 desirable before entering the Institute.

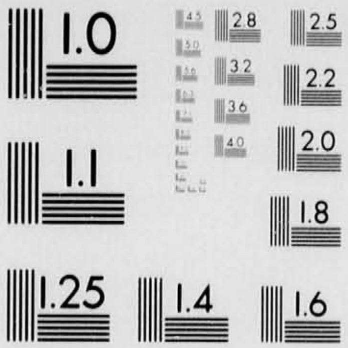
The topics included in the schedule are subject to change at any time by action of the Faculty.

Subjects numbered from 1 to 7 are the entrance requirements, full statements of which are given on pages 53 to 57.

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

MATHEMATICS.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
15	Algebra	Rec.	Wells, Skinner, Woods, Frizell	All reg. students.	1	1	7	4	(1) (2) (3)
16	Solid Geometry	Rec.	Wells, Skinner, Woods, Frizell	All reg. students.	1	1	8	4	(1) (2) (3)
17	Solid Geometry	Rec.	Skinner	IV. (Partial)	1	1	5	5	(1) (2) (3)
18	Logarithms, and Plane and Spherical Trigonometry	Rec.	Wells, Skinner, Bartlett, Woods, Frizell	All reg. students.	1	2	10 5	5 4	(15) (16)
19	Logarithms, and Plane Trigonometry	Rec.	Skinner	IV. (Partial)	1	1	10	5	(17)
20	Plane Analytic Geometry	Lect., Rec.	Runkle, Tyler, Bartlett, Woods.	All courses except VII. and IX.	2	1	15	3	(18)
21	Plane Analytic Geometry	Lect., Rec.	Skinner	VII., IX.	2	1	..	..	(15)
22	Differential Calculus	Lect., Rec.	Runkle, Osborne, Tyler, Bartlett, Woods	All courses except VII. and IX.	2	2	15	3	(20)
23	Integral Calculus	Lect., Rec.	Runkle, Osborne, Tyler, Skinner	All courses except VII. and IX.	3	1	5 10	4 2	(22)
24	General Theory of Equations	Lect., Rec.	Tyler	VIII.	2	2	15	2	(18)
25	Determinants	Lect., Rec.	Osborne	VIII.	2, 3	2	15	1	(18)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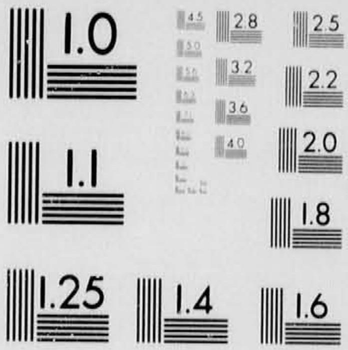
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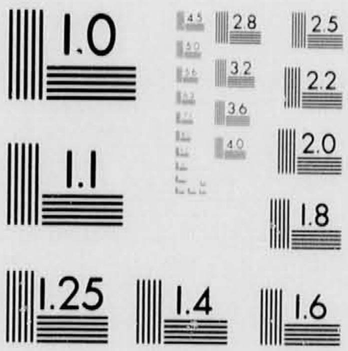
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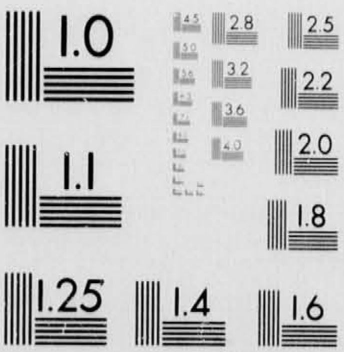
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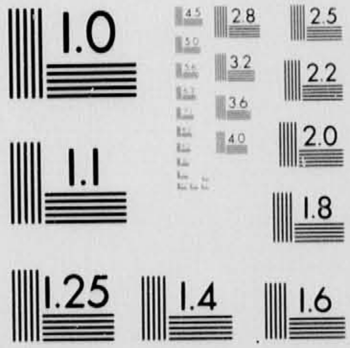
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M.I.T. ANNUAL CATALOGUES AND BULLETINS
1890/91

02 OF 03

MATHEMATICS.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
26	Advanced Algebra and Trigonometry	Lect.	Osborne	VIII.	3, 4	1	15	2	(18)
27	Analytic Geometry of Three Dimensions*	Lect., Rec.	Wells	VIII.	3, 4	1	15	2	(22)
28	Advanced Calculus*	Lect., Rec.	Wells	VIII.	3, 4	2	15	2	(23) (25)
29	Differential Equations	Lect., Rec.	Osborne	I., VI., VIII.	4	2	15	3	(23)
30	Theory of Probability and Method of Least Squares	Lect., Rec.	Bartlett	I., VI., VIII.	4	1	15	2	(23)
31	Quaternions	Lect., Rec.	Skinner	VI., VIII.	4	2	15	2	(23)
40	Spherical and Practical Astronomy	Lect., Rec.	Skinner	I.	3	2	5	3	

* Not given during the present school year.

APPLIED MECHANICS.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
41	Statics and Stresses in Frames	Lect., Rec.	Sondericker . .	I., II., III., IV., VI., VIII., X., XI.	3	1	10	2	(23) (155)
42	Strength of Materials; Kinematics and Dynamics .	Lect., Rec.	Sondericker . .	I., II., III., VI., VIII., X., XI.	3	2	15	3	(41)
43	Strength of Materials . . .	Lect., Rec.	Sondericker . .	IV.	3	2	10	3	(41)
44	Strength of Materials; Theory of Elasticity . . .	Lect., Rec., Lab.	Lanza, Merrill .	I., $III._2$, XI. . .	4	1	15	3	(42)
45	Strength of Materials Friction	Lect., Rec., Lab.	Lanza, Merrill .	II., $III._{1, 3}$, VI., X.	4	1	15	3	(42)
46	Strength of Materials . . .	Lect., Rec., Lab.	Lanza, Merrill .	IV.	4	1	7	3	(43)
47	Strength of Materials; Stability of Structures; Theory of Elasticity . . .	Lect., Rec., Lab.	Lanza, Merrill .	II., $III._{1, 3}$, X. .	4	2	15	3	(45)
48	Machinery and Motors . .	Lect., Rec.	Lanza	I., $III._2$, XI. . .	4	2	15	3	(44)

DRAWING.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
50	Geometrical and Mechanical Drawing	Lect., Draw.	Faunce, Burrison	All reg. students	1	1, 2	30	6	
51	Freehand Drawing	Draw.	Adams	All reg. students	1	1	15	1	
						2	15	2	
52	Descriptive Geometry	Lect., Rec., Draw.	Faunce	I., II., III., IV., VI., X., XI.	2	1	15	5	(16) (50) (51)

LITERATURE AND LANGUAGE.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
55	Rhetoric, and English Composition	Lect., Rec., Comp.	Carpenter, Herrick.	All reg. students.	1	1	15	2	(5) (6)
56	English Literature	Lect., Rec., Comp.	Emery	All reg. students.	2	2	15	2	(55)
57	English Composition	Lect., Comp.	Carpenter, Emery, Herrick	I., III., IV., V., VI., VII., VIII., X., XI., XII.	3	1	15	2	(56)
				II., III., IV., V., VI., VII., VIII., X., XII.	3	2	15	1	
				I., II., XI.	4	2	15	1	
58	English Literature before 1580*	Lect., Read.	Carpenter	IX.	3	1	15	2	(56)
59	Elizabethan Literature	Lect., Read.	Carpenter	IX.	3	2	15	2	(56)

* Not given during the present school year.

LITERATURE AND LANGUAGE.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
60	English Literature in the 18th Century	Lect., Read.	Carpenter	IX.	4	1	15	2	(56)
61	English Literature in the 19th Century	Lect., Read.	Carpenter	IX.	4	2	15	2	(56)
62	Contemporary English and American Literature	Lect., Read.	Carpenter	IX.	4	1	15	2	(56)
65	Logic: Argumentative Composition	Lect., Comp.	Carpenter	IX.	4	1	15	1	(57)
70	French (grammar and translation)	Rec.	Luquiens, Dippold	All reg. students.	1	1, 2	30	3	(4)
71	Advanced French	Lect., Rec.	van Daell	IX.	–	1, 2	30	3	(70)
72	French Literature	Lect., Rec.	van Daell	IX.	3	1, 2	15	2 or 4	(71)
73	German (elementary)	Rec.	van Daell, Dippold, Vogel	All reg. students.	2	1, 2	30	3	
74	German (grammar and translation)	Rec.	van Daell, Dippold, Vogel	All reg. students.	3	1, 2	30	3	(4) or (73)
75	Language (French, German, Spanish, Italian)	Lect., Rec.	van Daell, Luquiens, Dippold	IV., V., IX.	4	1, 2	30	3	(70) (74)
76	French (elementary)	Lect., Rec.	Vogel	Optional with 73	2	1, 2	30	3	

HISTORY.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No of Weeks.	Hours per Week.	Preparation required.
85	Political History since 1815.	Lect., Rec.	Levermore . . .	All reg. students .	1	2	15	2	(6)
86	Political History of England and the United States .	Lect., Rec.	Levermore . . .	IX.	2	1, 2	30	3	(85)
87	History and Literature of the Renaissance and the Reformation	Lect., Rec.	Levermore . . .	IV., VII. . . . 4 IX. 3	1, 2		30	2 3	(86)
88	Constitutional History . .	Lect., Rec.	Levermore . .	IX.	4		2	15	2 (86)
89	History of Philosophy . . .	Lect., Rec.	Levermore . . .	IX.	4		1	15	2

ECONOMICS AND STATISTICS.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
95	Political Economy	Lect., Rec.	Dewey	All reg. students .	2 (4)	1	15	2	(85)
96	Economic Problems . . .	Lect.	Dewey	IX.	2	2	15	2	(95)
97	Financial History of the U. S.	Lect., Rec.	Dewey	IX.	3	1	15	3	(95) (96)
98	Commercial Geography . .	Lect., Rec.	Niles	IX.	3	1	5	2	(95)
99	History of Commerce . . .	Lect., Rec.	Dewey	IX.	3, 4	2	15	3	(87) (97) (105)
100	Socialism and Co-operation .	Lect.	Dewey	IX.	3, 4	2	15	3	(97).
102	Taxation	Lect., Rec.	Dewey	IX.	4	1	15	3	(97)
103	Administration	Lect., Rec.	Dewey	IX.	4	1	15	1	(97)
104	History of Economic Theory	Lect., Rec.	Dewey	IX.	4	2	15	2	(102)
105	Statistics of U. S., and Graphic Methods . .	Lect., Draw.	Dewey	IX.	3	1	10	2	(95)
106	Statistics of Sociology . . .	Lect.	Dewey	IX.	4	1	15	4	(97) (105)
107	Banking and Finance . . .	Lect., Rec.	The President .	IX.	4	2	15	2	(95)

POLITICAL SCIENCE.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
115	Sociology	Lect., Rec.	Levermore	VII., IX.	3	2	15	3	(393)
116	Comparative Politics	Lect., Rec.	Levermore	IX.	4	1	15	3	(115)
117	International Law	Lect., Rec.	Levermore	IX.	4	2	15	2	(116)
124	Business Law	Lect.	Gray	All reg. students.	3, 4	2	15	1	

CHEMISTRY.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
125	General Chemistry	Lect., Lab.	Pope, Bardwell	All reg. students	1	1, 2	30	7, 6	(1) (2) (3) (4) (5) (6) (7)
126	Analytical Chemistry	Lect., Lab.	Drown, Noyes	III., V., VII., VIII., IX., X., XII.	2	1, 2	30	–	(73) (125)
				XI.	2	2	15		
127	Theoretical Chemistry	Lect., Rec.	Pope	III., V., VIII., XII.	2	1	15	2	(125)
128	Theoretical Chemistry	Lect., Rec.	Andrews	III., V., VIII., X.	3, 4	2	15	1	(127) or (248) first term.

NOTE. — Numbers in Italics in the right-hand 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.
129	Analytical Chemistry	Lect., Lab.	Drown, Talbot	III., V., VIII., XI., XII.	3	1, 2	30	–	(126)
130	Industrial Chemistry	Lect.	Norton	III., V., X.	3	1, 2	30	2	(50) (126) (70) or (74)
131	Organic Analysis	Lab.	Norton, Andrews	V.	4	1	15	–	(129)
132	Analytical Chemistry	Lab.	Drown	III., V., VIII.	4	1	15	–	(129)
133	Analytical Chemistry	Lab.	Drown	III.	4	2	15	–	(132)
134	Organic Chemistry	Lect.	Norton	V., X.	4	1, 2	30	2	(127) or (135)
135	Organic Chemistry	Lect.	Norton	V., VII., VIII., X., XI.	3 2	-	15	1	(125)
136	Organic Chemistry	Lab.	Norton, Andrews	V.	4	1, 2	30	12	(134)
137	Industrial Chemistry	Lab.	Norton, Smith	V., X.	4	1	15	12, 4	(126) (139)
138	Sanitary Chemistry	Lab.	Drown Mrs. Richards	V., VII., XI. XI.	3 4	1 or 2 1	15	6	(126)
139	Industrial Chemistry	Lab.	Norton, Smith	III., V. X.	3 3	1, 2 2	15, 30 15	6 5	(126) (130)
140	Sanitary Chemistry	Lab.	Drown Mrs. Richards	V.	4	1	15	6	(138)
141	Textile Coloring	Lab.	Norton, Smith	V., X.	4	1	15	6	(139)
142	Applied Chemistry	Lect.	Norton	X.	4	1, 2	30	1	(130)
143	Gas Analysis	Lab.	Drown, Gill	V., X.	4	1 or 2	15	1	(126)
144	Chemistry of Natural Waters	Lect.	Drown	XI.	4	2	15	1	(138)

PHYSICS.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
155	Physics	Lect.	Cross	All reg. students	2	1, 2	30	3	(18)
156	Descriptive Astronomy	Lect.	Clifford	I., VIII., IX.	2 or 4	1	15	1	(18)
157	Acoustics and Electricity (in connection with 155)	Lect., Rec.	Clifford	VI., VIII.	2	1 2	15 15	2 1	(18)
158	Physical Laboratory	Lab.	Collins	VI., VIII.	2	2	15	2	(20) (155) * (157)
159	Physics: Heat	Lect.	Clifford	All reg. students	3	1	8	2	(155)
160	Physical Laboratory	Lab.	Puffer, Collins	All courses except IV.	3	1 2	7 15	2	(20) or (21) (159)
161	Physical Laboratory	Lab.	Cross	V., VIII.	3	–	–	–	(20) or (21) (155)
162	Physical Laboratory	Lab.	Puffer, Collins	VI.	3	1, 2	7 15	2 3	(158)
164	Electricity	Read.	Cross	V., VI., VIII.	3	1	15	3	(155)
165	Elements of the Theory of Potential	Lect., Read.	Clifford	V., VI., VIII.	3	2	8	3	(164)
166	Electrical Measuring Instruments	Lect.	Puffer	V., VI., VIII.	3	2	7	3	(164)
167	General Physics (Optics, Acoustics, or Heat)	Read.	Cross, Clifford	VIII.	3	1, 2	30	3	(155) (157)
168	Advanced Physics (memoirs)	Read.	Cross	VI., VIII.	4	1, 2	30	1	(155) (162)

* The student must also be qualified to enter the second year of Course VI., as a regular, so far as mathematics and chemistry are concerned.

PHYSICS.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
169	Physical Laboratory	Lab.	Collins	V.	4	1	15	2	(160)
170	Physical Laboratory	Lab.	Cross, Puffer, Collins	I. VI., VIII.	4 4	1 1, 2	15 15	2 –	(162)
171	Heat Measurements	Lab.	Holman	III., X.	4	1	15	–	(159)
175	History of Physical Science.	Read.	Cross	VIII.	4	–	–	–	(155) (162)
176	Principles of Scientific Inves.	Read.	Cross	VIII.	4	–	–	–	(175)
177	General Physics	Read.	Cross	VIII.	4	1, 2	–	–	(23) (155) (161)
178	Precision of Measurements	Lect.	Clifford	VI., VIII.	4	1	10	2	(30)
179	Electrical Engineering	Lect.	Cross	VI.	4	1, 2	15 15	4 5	(162) (165)
180	Telegraph Engineering	Lect., Lab.	Jacques	VI.	4	1	–	–	(162) (165)
181	Railroad Signals	Lect.	Blodgett	I., II., VI.	4	2	–	–	(155)
182	Dynamo and Motor Testing	Lect.	Puffer	VI.	4	1	–	–	(162) (166)
183	Photometry	Lect.	Clifford	VI., VIII.	4	1	–	–	(162) (164)
184	Theory of Potential	Read.	Clifford	VI., VIII.	4	2	15	2	(23) (165)
185	Heating and Ventilation	Lect.	Woodbridge	II., IV., VII. XI.	4	1	15	1 2	
186	Elements of Dynamo Machinery	Lect.	Cross	II., III.	4	1	–	–	(155)

CIVIL ENGINEERING.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
200	Surveying	Lect., Rec., Field., Draw.	Burton, Robbins, Stanwood	I., III., XI., XII.	2	1, 2	30	6	(18) (50)
201	Surveying Instruments (six lessons)	Lect., Field.	Burton, Robbins	II.	3	2	–	–	(18) (50)
202	Surveying	Lect., Field.	Burton, Robbins	III.	2	1	15	4	(18) (50)
203	Topographical Drawing	Draw.	Burton, Robbins	I., III., XI.	2	1	15	2	(50) (51) (*200*)
204	Surveying	Lect., Field., Draw.	Burton, Robbins, Stanwood	I., XI., XII.	3	1, 2	30	2	(155) (156) (200) (203)
205	Geodesy	Lect., Field.	Burton	I.	4	1, 2	30	2	(23) (30) (40) (204)
205a	Geodesy	Lect.	Burton	I.	4	1	15	1	(23) (40) (204)
205b	Geodetic Surveying	Lect., Field.	Burton	XII.	4	1	15	2	(23) (204)
206	Railroad and Highway Engineering	Lect., Rec.	Allen	I., III., XI.	3	1, 2	30	2	(23) (200) (*204*)
208	Railroad Field-work and Drawing	Field., Draw.	Allen, Robbins	I., III., XI.	3	1, 2	30	4 –	(*206*) (207)
210	Railroad Engineering	Lect., Rec., Draw.	Allen	I.	4	1, 2	30	3	(42) (208) (212)
211	Railroad Management	Lect.	Allen	I.	4	1	15	2	(95)

CIVIL ENGINEERING.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
212	Stereotomy	Lect., Draw.	Porter	I., XI.	3	1	15	4	(52)
213	Theoretical Hydraulics	Lect., Rec.	Porter	I., III., XI. II., VI., X.	4 4	1 1	15 7	3 2	(42)
214	Hydraulic and Sanitary Engineering	Lect., Rec.	Porter	I., XI.	4	1	15	3	(42) (*213*)
215	Sanitary Designing	Draw.	Porter	I., XI.	4	2	15	2	(*213*) (*214*)
216	Hydraulic Motors	Lect., Rec.	Porter	II., X.	4	2	15	2	(213)
217	Hydraulic Engineering	Lect., Rec.	Porter	I., III., XI.	4	2	15	3	(213) (214) (218)
218	Hydraulic Measurements and Sanitary Field-work	Field., Draw.	Porter	I., III., X., XI., XII.	4	1	15	2	(*213*)
219	Elements of Construction	Lect., Rec.	Swain	I., XI.	3	2	15	2	(*41*) (212)
220	Elementary Design	Draw.	Swain, Robbins . Stanwood	I., XI.	3	2	15	2	(*219*)
221	Theory of Structures	Lect., Rec.	Swain, Robbins	I., XI. III.	4	1, 2	30	2 –	(*43*) (220)
222	Bridges and Similar Structures	Lect., Rec.	Swain	I., XI.	4	1, 2	30	2	(*43*) (220) (*221*)
223	Bridge Design	Draw.	Swain, Robbins . Stanwood	I. XI.	4 4	1, 2 1	30 15	6	(*221*) (*222*)

MECHANICAL ENGINEERING.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
240	Principles of Mechanism . .	Lect., Rec.	Purinton . . .	II., III., VI., X. .	2	1	15	2	(18) (50) (*52*)
241	Drawing	Draw.	Schwamb . . .	II.	2	1	15	2	(18) (50)
242			Miller	II., X.	2	2	15	6	
243				III.	2	2	15	3	(*20*) (*52*)
244				VI.	2	2	15	4	
245	Mechanism: Construction of Gear-Teeth, Machine Tools, Cotton Machinery .	Lect., Rec.	Schwamb . . .	II., X.	2	2	15	3	(240) (*22*)
246				III., VI. . . .	2	2	10	3	
247	Principles of Mechanism . .	Lect., Rec.	Purinton . . .	I.	2	2	15	2	(18) (50) (*20*) (*52*)
248	Steam Engineering; Valve Gears; Boilers	Lect., Rec.	Peabody, Merrill	II., III., VI., X.	3	1, 2	30	3	(22) (155) (240)
				VIII.	4	1	15	3	(*23*) (*41*) (*42*) (*159*)
249	Drawing, Design	Draw.	Peabody . . .	II.	3	1, 2	30	6	(242)
250			Schwamb . . .	III.	3	1	15	5	(243)
251			Miller					2	
252				VI.	3	1	15	3	(244)
						2	15	2	
				X.	3	1	15	6	(242)
						2	15	2	
253	Engineering Laboratory . .	Lab.	Merrill	II., III., VI., X. .	3	2	15	2	(*248*)
254	Steam Engineering	Lect., Rec.	Peabody . . .	II., III., VI., X. .	4	1	8	2	(248)
255	Dynamics of Machines . .	Lect., Rec.	Lanza	II.	4	1	9	3	(42)
256				VI., X.	4	1	5	3	(42)

MECHANICAL ENGINEERING.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
257	Machine Design	Lect., Rec., Draw.	Schwamb	II.	4	1	15	8	(42) *(43)* *(44)*
259	Engineering Laboratory	Lab.	Merrill	II. III., VI., X.	4	1, 2	30	4	(248) first term. *(216)* *(254)* *(255)*
260	Locomotive Construction	Lect., Rec.	Lanza	II.	4	1 2	6 15	2 3	(254) (255) *(43)* *(44)* *(216)* *(254)* *(255)* *(257)*
261	Marine Engineering	Lect., Rec.	Peabody	II.	4	1 2	6 15	3 3	(254) (255) *(43)* *(44)* *(216)* *(254)* *(255)* *(257)*
262	Mill Engineering	Lect., Rec.	Schwamb	II	4	1 2	6 15	3 3	(254) (255) *(43)* *(44)* *(216)* *(254)* *(255)* *(257)*
263	Carpentry and Wood-Turning	Shop.	Merrick	II., IX. VI. VIII. X.	2 2 3 4	1 1, 2 1	15 30 15	4 2 4	
264	Pattern Work	Shop.	Merrick	II.	2	2	15	2	(263)
265	Forging	Shop.	Lambirth	II., IX. X.	3 4	1 2 2	15 5 15	6 4 6	
266	Chipping and Filing	Shop.	Smith	II.	3 4	2 1	10 4	4 6	
267	Machine-Tool Work	Shop.	Smith	II.	4	1, 2	24	6	(266)
268	Metal Turning	Shop.	Smith	VI.	2	1	15	2	
269	Technical Machinery	Lect.	Peabody	III., X.	4	2	15	2	(254)

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

MINING ENGINEERING.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
290	Blowpipe Silver Assay . .	Lab.	Richards . . .	III.	2	1	15	2	(125)
292	Mining Engineering . . .	Lect.	Richards, Hofman	III., XII. . . .	3	1, 2	30	3	(155) (200) (366)
293	Assaying by Fire	Lab.	Richards, Lodge	III.	3	2	15	4	(126) (366)
				V.	3	2	15	2	
				XII.	4	2	15	2	
294	Metallurgy of Iron	Lect.	Richards . . .	I., II., III., V., X.	4	1	15	1	(125)
295	Metallurgy	Lect.	Richards, Hofman, Howe . .	III., V., X., XII.	4	1	15	2	(126) (366)
296	Mining	Lab.	Richards, Lodge	III.	4	1	15	8	(125) (293) (366)
						2	15	12	
297	Mining and Metallurgy . .	Lab.	Richards, Lodge	III., V.	4	1	15	8	(129) (293) (366)
						2	15	12	
298	Ore-Dressing	Lect.	Richards . . .	III.	4	1	15	1	(155)
299	Metallurgy	Lect.	Richards, Hofman	III., X.	4	2	15	3	(295)
300	Drawing	Draw.	Richards . . .	III.	3	1	15	2	(50) (51)
					4	1	15	1	
301	Memoirs	Read.	Richards, Hofman	III.	4	1, 2	30	2	(*296*) (*297*)

NOTE. — Numbers in Italics in the right-hand 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.
320	Architectural History . . .	Lect., Rec., Draw.	Homer	IV.	2 3	2 1	30	1	
321	Architectural History . . .	Lect., Rec., Draw.	Homer	IX.	3	1	15	1	(50) (51) (52)
322	Orders	Lect., Rec., Draw.	Homer	IV.	2	1	15	2	(50) (51)
323	Shades, Shadows, and Perspective	Lect., Draw.	Homer, Kilham .	IV.	2	2	15	1	(50) (51)
325	Materials	Lect., Rec.	Chandler . . .	IV.	2	2	15	2	(320) (322)
326	Specifications and Working Drawings	Lect., Draw.	Chandler . . .	IV.	3	1, 2	30	1	(325)
327	Iron Construction	Lect., Draw.	Chandler, Kilham	IV.	4	2	15	1	(326)
328	Stereotomy	Lect., Draw.	Homer	IV.	3	2	15	2	(52)
329	Business Relations, Contracts, etc.	Lect.	Chandler . . .	IV.	4	2	15	1	(325) (326)

ARCHITECTURE.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
331	History of Construction	Lect.	Chandler	IV.	4	1	15	1	(326)
332	History of Ornament	Lect., Draw.	Walker	IV.	4	1, 2	30	½	(320) (322) (323) (339)
333	Design	Draw.	Homer, Kilham	IV.	2	2	15	4	(322)
334	Design	Draw.	Létang	IV.	3	1 2	15 15	9 15	(333)
335	Advanced Design	Draw.	Létang	IV.	4	1 2	15 15	16 24	(334)
336	Pen and Ink	Draw.	Gregg	IV.	2	2	15	1	
337	Pen and Ink	Draw.	Gregg	IV.	3	1, 2	30	1	(336)
338	Free-Hand Drawing	Draw.	Adams	IV.	2	1, 2	15	4	
339	Free-Hand Drawing	Draw.	Adams	IV.	3	1, 2	15	2	(338)
340	Water Color	. . .	Walker	IV.	3	2	30	2	(338)
341	Water Color	. . .	Walker	IV.	4	1, 2	30	2	(340)
342	History of Painting and Sculpture	. . .	. . .	IV.	4	2	15	1	(320) (334)
343	Graphical Statics	. . .	Homer	IV.	4	1	8	2	(52) (328)

NATURAL SCIENCES.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
360	Physical Geography . . .	Lect.	Niles	I., III., V., VII., IX., XI., XII. .	2	2	15	3	(7) (155) 1st term
361	Geology (Elements of Lithology and Structural Geology)	Lect., Lab.	Crosby	I., IV., V., IX., XI.	3	1	15	2	(125)
362	Geology (Lithological, Structural, and Chemical) . .	Lect., Lab.	Crosby	III., V., VII., XII.	3	1	15	3	(366)
363	Historical Geology	Lect., Rec.	Niles	III., V., VII., IX., XII.	3	2	15	3	(360) (361) or (362)
364	Historical Geology	Lect., Rec.	Niles	I	3	2	15	2	(360) (361)
365	Climatology	Lect., Rec.	Niles	VII., IX., XII. .	4	1	15	2	(155)
366	Mineralogy	Lect., Lab.	Crosby, Barton .	I., III., V. VII., XII.	2	2	15	6	(3) (125)
367	Mineralogy	Lect., Lab.	Crosby, Barton .	XII.	3	2	15	4	(366)
368	Geological Field-work . .	Field.	Crosby, Barton .	XII.	3	1	15	4	(360) (366)
369	Geological Maps and Sections	Field., Draw.	Niles, Cobb . .	XII.	3	2	15	2	(362) (368)
370	Geological Field-work and Laboratory	Field., Lab.	Niles, Crosby, Barton, Cobb . .	XII.	4	1 2	15 15	8 10	(362) (363) (368) (369)
371	Physiographic Geology, including Orography . . .	Lect., Rec.	Niles, Cobb . .	XII.	4	1	15	3	(362) (363) (368) (369)

NATURAL SCIENCES.

No.	Subject.	Lect., Rec., Lab., Draw., or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
372	Hydrography, including Tidal Phenomena	Lect.	Niles	XII.	4	2	15	3	(362) (363) (368) (369)
373	Geological Memoirs	Rec.	Niles, Crosby	XII.	4	1, 2	30	1	(363)
374	Paleontology	Lab.	Niles, Cobb	XII.	3	1, 2	30	2	
375	Paleontology, including Osteology	Lab.	Niles, Cobb	XII.	4	1	15	5	(363) (374) (380)
376	Economic Geology	Lect.	Crosby	XII.	4	1, 2	30	2	(362) (363) (367)
377	Ore-Deposits	Lect.	Crosby	XII.	4	2	15	2	(362) (363)
378	Micro-Lithology	Lect., Lab.	Barton	XII.	4	1, 2	30	3	(362) (363) (367)
380	General Biology	Lect., Rec., Lab.	Sedgwick	VII., IX. XI., XII.	2 3	1	15	6 1, 4	
381	Microscopy	Lect., Rec., Lab.	Sedgwick	V., VIII.	2	2	15	2	
382	Biology of the Micro-organisms; Elementary Botany	Lect., Rec., Lab.	Sedgwick	VII., IX. XI.	2 3	2 2	15 15	3, 1 4	(380)
383	Comparative Anatomy and Embryology	Lect., Rec., Lab.	Gardiner	VII.	3	1 2	15 15	8 6	(382)
384	Physiology of the Senses	Lect., Rec., Lab.	Sedgwick	VIII.	3	1	15	2	(381)

NATURAL SCIENCES.

No.	Subject.	Lect., Rec., Lab., Draw, or Field.	Instructor.	Taken by	Year.	Term.	No. of Weeks.	Hours per Week.	Preparation required.
385	Zoölogy	Lect., Lab.	Gardiner	VII., IX., XII.	2	1, 2	30	2	
386	Cryptogamic Botany	Lect., Rec., Lab.	Sedgwick	VII.	3	1	15	4	(382)
387	Comparative Physiology	Lect., Rec., Lab.	Sedgwick	VII.	4	1, 2	30	8	(383)
388	Microscopic Anatomy	Lect., Rec., Lab.	Gardiner	VII.	4	1, 2	30	8	(383)
390	Public Hygiene	Lect.	Sedgwick	I., IX.	4	2	15	2	
391	Higher Biology	Lect.	Sedgwick, Gardiner	VII.	4	1	15	1	(382) (383)
392	Teaching of Natural Sciences	Lect.	Sedgwick	VII.	4	2	15	1	
393	Anthropology	Lect.	Gardiner	VII., IX.	3	1	15	1	
394	History of Natural Sciences	Lect.	Sedgwick	VII., IX.	4	1	15	1	
395	Sanitary Biology	Lect., Rec., Lab.	Sedgwick	VII., XI.	4	1	15	4	(380)
396	Bacteriology and Public Hygiene	Lect., Rec., Lab.	Sedgwick	VII., XI.	4	2	15	8	(395)
397	Sanitary Science	Lect.	Sedgwick	IV.	4	1, 2	30	2	
398	Systematic Botany	Lect., Lab.	Sedgwick	XII.	3	2	15	1	

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 January 28. On legal holidays and on the Friday and Saturday following Thanksgiving Day the exercises of the school are suspended.

CALENDAR FOR 1890-91.

School year began	Monday, Sept. 29, 1890.
Second term will begin	Tuesday, Feb. 3, 1891.
Degrees conferred	Tuesday, June 2, 1891.
First Entrance Examinations	Thursday, June 25, 1891, and Friday, June 26, 1891.
Second Entrance Examinations	Tuesday, Sept. 22, 1891, and Wednesday, Sept. 23, 1891.
Examinations for Advanced Standing	Wednesday, Sept. 16, 1891.
School year of 1891-92 will begin	Monday, Sept. 28, 1891.

CALENDAR FOR 1891-92.

School year will begin	Monday, Sept. 28, 1891.
Second term will begin	Tuesday, Feb. 2, 1892.
Degrees conferred	Tuesday, June 1, 1892.
First Entrance Examinations	Thursday, June 24, 1892, and Friday, June 25, 1892.
Second Entrance Examinations	Tuesday, Sept. 21, 1892, and Wednesday, Sept. 22, 1892.
Examinations for Advanced Standing	Wednesday, Sept. 15, 1892.
School year of 1892-93 will begin	Monday, Sept. 27, 1892.

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

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, before the September entrance examinations, and 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 convenient for the instructors in whose subjects they have been conditioned.

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.

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 Paper. — At the opening of each term of every year the student should fill out, and present to the Secretary, an attendance paper, blank forms for which will be supplied. The attendance paper is the direct means by which the student

places before the Faculty his wishes in regard to his course or selection of studies. The paper must be presented at the earliest possible moment, to give opportunity for the immediate determination of qualifications and status.

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 bills of the Massachusetts Institute of Technology. If, for any reason, such a bond cannot be obtained, a deposit of fifty dollars, as security, will be accepted. 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 the advanced courses is the same as that for regular students.

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. — *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.

James Savage Scholarship 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.

Susan H. Swett Scholarship 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.

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 committee 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 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 Scholarship. The Coöperative Society of the students of the Institute applies its annual profits to the assistance of some member of the Society, selected by its Board of Directors, with the approval of the Faculty.

Conditions governing Scholarships. — The facts considered in making assignments of scholarships 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 have been established, and will be awarded to such applicants as are recommended by the Faculty.

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 from six 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 the subjects they have selected, unless excused by special vote of the Faculty. Students entering a lecture-room, drawing-room, or laboratory more than five minutes after the hour designated for the beginning of the exercise will be marked tardy. 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 P. M. There are no exercises on Saturday afternoon, and the rooms are closed.

Discipline. — 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 will 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 suburban 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.

Candidate for Advanced Degree.

NAME.	HOME.	RESIDENCE.
Sherman, Charles Winslow S. B., Mass. Inst. Technology.	*Kingston*	140 W. Canton St.

Adams, Arthur Henry S. B., Mass. Inst. Technology.	*Newton*	Newton.
Bolan, Thomas Vincent A. B., Georgetown College.	*Philadelphia, Pa.*	40 Dudley St., R.
Calkins, Leighton A. B., Harvard University.	*Newton.*	Newton.
Clark, Clara May A. B., Smith College.	*Northampton.*	10 Columbus Sq.
Clarke, Prescott Orloff B. P., Brown University.	*Providence, R. I.*	24 Kenilworth St., R.
Clement, Hugh Barrett Ph. B., Kenyon College.	*Hepburn, Ohio*	136 Chandler St.
Codman, John Sturgis A. B., Harvard University.	*Cotuit*	57 Marlboro' St.
Covell, Eddy Clark A. B., Hamilton College.	*Cazenovia, N. Y.*	41 Union Park.

NAME.	HOME.	RESIDENCE.
Crane, Joshua, Jr. A. B., Harvard University.	*Brookline*	Brookline.
Dadmun, George Estabrook A. B., Harvard University.	*Philadelphia, Pa.*	13 Arlington St.
Daniell, Joshua B. S., Michigan Mining School.	*Opechee, Mich.*	302 Columbus Ave.
Derr, Louis B. A., Amherst College.	*Pottsville, Pa.*	10 Columbus Sq.
Dill, Howard Albert S. B., Swarthmore College.	*Richmond, Ind.*	99 Pinckney St.
Esty, William B. A., Amherst College.	*Amherst*	10 Columbus Sq.
Foster, Francis Homer B. S., Boston University.	*Andover*	273 Columbus Ave.
Graves, William Hagerman B. L., Cornell University.	*Milwaukee, Wis.*	Cambridge.
Grover, Nathan Clifford B. C. E., Maine State College.	*West Bethel, Me.*	370 Shawmut Ave.
Hammond, Alonza John B. S., Rose Polytechnic Institute.	*Frankfort, Ind.*	35 Warren Ave.
Harris, John Luther S. B., Michigan Mining School.	*Hancock, Mich.*	144 Boylston St.
Hubbard, Gorham A. B., Harvard University.	*Boston*	210 Beacon St.
Lewis, Daniel Clark A. B., Haverford College.	*Suspension Bridge, N. Y.*	202 Dartmouth St.
Lincoln, George Russell S. B., Mass. Inst. Technology.	*Hingham*	Hingham.
Maltby, Margaret Eliza A. B., Oberlin College.	*Oberlin, Ohio*	7 Irvington St.
Marquand, Philip A. B., Harvard University.	*Newburyport*	4 Spruce St.
Pike, Gordon Brainerd B. A., Yale University.	*Middletown, Conn.*	12 St. James Ave.
Poland, William Babcock S. B., Mass. Inst. Technology.	*Boston*	19 Garrison St.
Pulsifer, Louis Warren A. B., Harvard University.	*Cambridge*	Cambridge.
Ripley, William Zebina S. B., Mass. Inst. Technology.	*Newton*	Newton.
Roberts, Harold Barnes S. B., Mass. Inst. Technology.	*Boston*	81 Mt. Vernon St.
Roberts, William Jackson A. B., Oregon State University.	*The Dalles, Oreg.*	22 St. Charles St.
Robinson, Dwight Parker A. B., Harvard University.	*Wareham*	Cambridge.
Root, Edward Thompson A. B., Brown University.	*Providence, R. I.*	Malden.
Sackett, Ward Myron C. E., Allegheny College.	*Meadville, Pa.*	52 Chandler St.

NAME.	HOME.	RESIDENCE.
Sage, Henry Judson A. B., Yale University.	*Cincinnati, Ohio*	89 Charles St.
Schweitzer, John Francis A. B., Spring Hill College.	*New Orleans, La.*	292 Columbus Ave.
Shaw, Howard Van Doren B. A., Yale University.	*Chicago, Ill.*	27 St. James Ave.
Starr, Palmer Williamson B. C. E., Iowa State College.	*Carson, Ia.*	30 Dartmouth St.
Stilwell, Henry Colby B. S., Denison University.	*Dayton, Ohio*	127 Pembroke St.
Sykes, Henry Hutchins Ph. B., Yale University.	*New Haven, Conn.*	Melrose Highlands.
Thorndike, Harry Hill A. B., Harvard University.	*Boston*	175 Marlboro' St.
Thorndike, Sturgis Hooper A. B., Harvard University.	*Cambridge*	Cambridge.
Torossian, Toros Houhanes B. A., Robert College.	*Roustchuk, Boulgaria*	613 Tremont St.
Tuttle, Reuel Crompton A. B., Trinity College.	*Windsor, Conn.*	12 Exeter Chambers.
Vielé, Francis Stuart A. B., Hobart College.	*Geneva, N. Y.*	22 Yarmouth St.
Walker, George Lounsbury B. S., University of the City of New York.	*New York, N. Y.*	2 Columbus Sq.
Westcott, Frank Thomas Ph. B., Brown University.	*Hopedale*	Hopedale.
Wheeler, Arthur Lincoln A. B., Brown University.	*Concord*	Concord.
Whitaker, Samuel Edgar A. B., Boston University.	*Portland, Me.*	39 Holyoke St.

REGULAR STUDENTS.

Fourth Year.

NAME.	COURSE.	HOME.	RESIDENCE.
Aiken, Charles Wilson	II.	*Franklin, N. H.*	111 Pembroke St.
Ball, Robert Steele	II.	*Dublin, Ireland*	165 W. Canton St.
Barri, Joel Gray	I.	*Cambridgeport*	Cambridgeport.
Bassett, William Hastings	V.	*New Bedford*	760 Tremont St.
Bird, Adelaide	VII.	*Cambridge*	Cambridge.
Birks, John Henry	II.	*Montreal, Can.*	217 Huntington Ave.
Blackmer, James Weston, 2d	I.	*Plymouth*	Plymouth.
Blackwell, Ethel Brown	VII.	*Elizabeth, N. J.*	Boutwell Ave., D.
Blanchard, Fred'k Chambers	II.	*Dorchester*	293 Commerc'l St., D.
Bolan, Thos. Vincent, A.B.	VI.	*Philadelphia, Pa.*	40 Dudley St., R.
Bowen, Stephen	II.	*Roxbury*	255 Warren St., R.
Bradlee, Henry Goddard	VI.	*Boston*	113 Beacon St.
Bradley, Harry Cyrus	I.	*Roxbury*	5 Gay Head St, R.
Brainerd, Wallace Heber	VI.	*Chicago, Ill.*	772 Dudley St., D.
Brand, Horace Lewis	II.	*Chicago, Ill.*	111 Pembroke St.
Bryant, Dixie Lee	VII.	*Columbia, Tenn.*	12 Dartmouth St.
Bryant, William Page	X.	*Charlestown*	170 Bunker H. St., C.
Bryden, George William	II.	*Chelsea*	Chelsea.
Burton, Frank Howard	II.	*Providence, R. I.*	54 Berkeley St.
Campbell, George Ashley	I.	*Derry, N. H.*	302 Columbus Ave.
Capen, Barnard, Jr.	VI.	*So. Boston*	534 E. 4th St., S. B.
Childs, Edward Lincoln	II.	*Lee*	23 Worcester Sq.
Clement, Hugh Barrett, Ph. B.	IV.	*Hepburn, Ohio*	136 Chandler St.
Cole, Fred Allen	II.	*Camden, Me.*	Hotel Edinburgh.
Cole, Harrison Irving	II.	*Kingston*	140 W. Canton St.
Collins, Reuben Belknap	I.	*Dedham*	Dedham.
Conant, Roger Winthrop	VI.	*Gloucester*	212 W. Canton St.
Cunningham, Edward	X.	*East Milton*	East Milton.
Curtis, William Goodwin	I.	*Brooklyn, N. Y.*	658 Tremont St.
Dart, William Crary	X.	*Providence, R. I.*	33 St. James Ave.
Dill, Howard Albert, B. S.	I.	*Richmond, Ind.*	99 Pinckney St.
Donn, Edward Wilton, Jr.	IV.	*Washington, D. C.*	94 Huntington Ave.
Dorr, Frank Hayes	VI.	*Great Falls, N. H.*	55 East Chester Pk.
Dunham, Lewis Augustus	I.	*De Pere, Wis.*	58 Chester Sq.

NAME.	COURSE.	HOME.	RESIDENCE.
England, Paul Willard	VI.	*Allston*	4 Gardner St., A.
Ensworth, Horace Hayden	VI.	*Hartford, Conn.*	Hotel Ilkley.
Favor, George Warren	III.	*Chicago, Ill.*	144 Boylston St.
Fiske, Henry Anthony	X.	*Roxbury*	50 Elmore St., R.
Forbes, Howard Carleton	X.	*Roxbury*	96 Elm Hill Ave., R.
French, Lester Gray	II.	*Brattleboro', Vt.*	13 Concord Sq.
Füger, Frederic William	II.	*Fort Barrancas, Fla.*	94 Huntington Ave.
Garrison, Charles	VI.	*Brookline*	Brookline.
Greer, Medorem William	VI.	*Tacoma, Wash.*	52 Chandler St.
Hamilton, Edgar Lockwood	III.	*Fond du Lac, Wis.*	33 St. James Ave.
Hammond, Chas. Frederick	I.	*Detroit, Mich.*	17 Blagden St.
Harwood, Harry Adams	I.	*Boston*	212 W. Newton St.
Haskins, William	III.	*Medford*	Medford.
Hatch, Arthur Elliott	I.	*Charlestown*	1 St. James Ave.
Hathaway, Herbert Emerson	V.	*Fall River*	78 Huntington Ave.
Hersam, Ernest Albert	V.	*Stoneham*	Stoneham.
Heywood, Lincoln Crawford	I.	*Pawtucket, R. I.*	1 St. James Ave.
Holmes, George Alfred	X.	*Newton Centre*	Newton Centre.
Hopton, Walter Edwin	II.	*Bridgeport, Conn.*	30 Hanson St.
Jordan, Harry Warren	V.	*Kennebunk, Me.*	92 Pembroke St.
Kauffman, Milton Henry	V.	*Chicago, Ill.*	5 Oxford Terrace.
Keene, Thomas Means	I.	*Chelsea*	Chelsea.
Keene, William Faitoute	I.	*Saugatuck, Conn.*	12 St. James Ave.
Kimball, Herbert Sawyer	X.	*Jamaica Plain*	Bishop St., J. P.
Knowles, Morris, 2d.	I.	*Lawrence*	21 St. Charles St.
Koch, Charles Frederick	II.	*Cincinnati, Ohio*	142 Chandler St.
Lawrence, William Henry	IV.	*Dorchester*	34 Sumner St., D.
Leeming, Woodruff	IV.	*Brooklyn, N. Y.*	17 St. James Ave.
Leland, William Emmons	II.	*Saxonville*	Saxonville.
Libbey, Ernest Linwood	II.	*Lowell*	Lowell.
Mahon, Ross Le Hunt	II.	*Detroit, Mich.*	111 Pembroke St.
Maltby, Margaret Eliza, A. B.	VIII.	*Oberlin, Ohio*	7 Irvington St.
Mansfield, Arthur Newhall	VIII.	*Wakefield*	Wakefield.
March, Clement	I.	*Cambridge*	Cambridge.
McKenna, Alexander George	V.	*Allegheny, Pa.*	145 W. Newton St.
Meyer, Joseph Andrew, Jr.	IV.	*Boston*	10 Rutland St.
Mitchell, Guy Edward	II.	*Lowell*	Lowell.
Moore, Frederick Clouston	II.	*Brookline*	Brookline.
Moore, Fred Forrest	I.	*Waltham*	Waltham.
Moseley, Alexander Willett	II.	*Evanston, Ill.*	78 Rutland St.
Mossman, William	VI.	*Mattapan*	Norfolk St., M.
Norton, Fred Elmer	II.	*Little Rock, Ark.*	80 Pinckney St.

NAME.	COURSE.	HOME.	RESIDENCE.
Oxford, Geo. Henry Kimball	VI.	*Cambridgeport*	Cambridgeport.
Palmer, William Irving	VI.	*Winchester*	Winchester.
Pratt, Nathan Raymond	I.	*Sudbury*	63 Chandler St.
Ramsey, Allan	VII.	*Cincinnati, Ohio*	5 Walnut St.
Read, Carleton Allen	II.	*Rockland*	731 Tremont St.
Richardson, Wm. Cumston	II.	*Boston*	365 Marlboro' St.
Ricker, Charles William	VI.	*Buffalo, N. Y.*	150 Warren Ave.
Roberts, Harold Barnes, S. B.	I.	*Boston*	81 Mt. Vernon St.
Roberts, Wm. Jackson, A. B.	I.	*The Dalles, Oreg.*	22 St. Charles St.
Roots, Willard Holt	IX.	*Little Rock, Ark.*	80 Pinckney St.
Rose, Frederick Holland	II.	*Cleveland, Ohio*	78 Rutland St.
Shattuck, Arthur Forrest	V.	*Winchester*	Winchester.
Snyder, Frederick Titcomb	VI.	*Waterford, N. Y.*	165 W. Brookline St.
Spaulding, Henry Plimpton	VI.	*Newton*	Newton.
Spencer, Theodore	VI.	*Cambridge*	Cambridge.
Spooner, George Howard	VI.	*New Bedford*	760 Tremont St.
Stearns, Edward Burnham	I.	*East Watertown*	East Watertown.
Stix, Sol. Henry	IV.	*Cincinnati, Ohio*	352 Columbus Ave.
Stoddard, Arthur Bates	V.	*Taunton*	Taunton.
Swan, James	II.	*Dorchester*	Arcadia St., D.
Sykes, Henry Hutchins, Ph.B.	VI.	*New Haven, Conn.*	Melrose Highlands.
Taylor, Harry Burlingame	V.	*Boston*	140 Marlboro' St.
Thompson, Herbert Arthur	VIII.	*Amherst*	234 W. Canton St.
Trowbridge, Walter Bacon	II.	*Newton*	33 St. James Ave.
Tyler, Clifford Molineaux	II.	*Brookline*	Brookline.
Vaillant, George Wightman	I.	*New York, N. Y.*	27 Blagden St.
Verges, Luis Francisco	I.	*Arroyo, Porto Rico*	Hotel Cluny.
Vielé, Francis Stuart, A. B.	VI.	*Geneva, N. Y.*	22 Yarmouth St.
Wait, Henry Heileman	VI.	*Chicago, Ill.*	82 Myrtle St.
Warner, George Menzies	VI.	*Fall River*	202 Dartmouth St.
Warren, Joseph Adams	I.	*Cumberland Mills, Me.*	304 Columbus Ave.
Wason, Leonard Chase	VI.	*Brookline*	Brookline.
Weed, Henry Townsend	V.	*Brooklyn, N. Y.*	145 W. Newton St.
Weston, William Hutchinson	III.	*Boston*	285 Newbury St.
Wetherbee, Charles Phelps	II.	*Detroit, Mich.*	Somerville.
White, Annie Elizabeth	V.	*Roxbury*	70 Vernon St., R.
Wilder, Salmon Willoughby, Jr.	X	*Lowell*	Lowell.
Wilson, Fred Allyn	II.	*Nahant*	11 Albion St., D
Wood, Charles Hancock	II.	*Brookline*	Brookline

Third Year.

NAME.	COURSE.	HOME.	RESIDENCE.
Adams, William Linville	II.	*East Boston*	111 Eutaw St., E. B.
Beal, Charles Alston	VI.	*Abington*	Abington.
Beckler, Alice Hooper	VII.	*South Boston*	590 E. 7th St., S. B.
Bigelow, Charles Hudson	VI.	*Salem*	Cambridgeport.
Brown, Bertha Millard	VII.	*Roxbury*	16 Holborn St., R.
Brown, William Franklin Snow	II.	*Portland, Me.*	66 Chester Sq.
Buckley, James Pinkney	VI.	*Detroit, Mich.*	35 St. James Ave.
Burbank, Philip Mountfort	VI.	*Waltham*	Waltham.
Burnham, Charles Morton	VI.	*Waltham*	Waltham.
Burnham, Guy Johnston	X.	*Gloucester*	32 Gardner St., A.
Burnham, Harry Atwood	II.	*Waltham*	Waltham.
Card, Huber David	XII.	*Willimantic, Conn.*	West Medford.
Cater, Douglas Aymar	II.	*New York, N. Y.*	5 St. James Ave.
Chase, Charles Harris	VI.	*Stoneham*	Stoneham.
Chase, Richard Davenport	XI.	*New Bedford*	376 Columbus Ave.
Church, Albert Kingsley	V.	*Lawrence*	295 Columbus Ave.
Clogher, Arthur William	IX.	*Dedham*	Dedham.
Cody, Lewis Philip	VI.	*Grand Rapids, Mich.*	40 Union Park.
Coggin, Frederick Griswold, Jr.	II.	*Lake Linden, Mich.*	212 W. Canton St.
Colby, John Mason, Jr.	II.	*East Boston*	117 Trenton St., E.B.
Covell, Eddy Clark, A B.	V.	*Cazenovia, N. Y.*	41 Union Park.
Crane, Joshua, Jr., A. B.	VI.	*Brookline*	Brookline.
Creden, Thomas Harold	VI.	*South Boston*	940 Broadway, S. B.
Curtin, John Andrew	I.	*Roxbury*	19 Waumbeck St., R.
Dadmun, George Estabrook, A.B.	II.	*Philadelphia, Pa.*	13 Arlington St.
Dana, Gorham	I.	*Dorchester*	34 Glendale St., D.
Davis, Carleton Emerson	I.	*Newton Centre*	Brookline.
Dean, Arthur Warren	XI.	*Taunton*	Taunton.
de Bullet, John Chas. Eugene	I.	*Carroll, Md.*	Hotel Brunswick.
Dennett, William Hartley	IV.	*Saco, Me.*	58 Chester Sq.
Derr, Louis, B. A.	VI.	*Pottsville, Pa.*	10 Columbus Sq.
Dodd, Margaret Eliot	VII.	*Roxbury*	43 Moreland St., R.
Douglass, Walter Bailey	I.	*Lowell*	Lowell.
Dresser, Henry Chester	II.	*Southbridge*	22 Concord Sq.
du Bois, Barron Potter	VI.	*Portsmouth, N. H.*	321 Columbus Ave.
Eldridge, George Frederic	V.	*Hyde Park*	Hyde Park.
Ely, Sumner Boyer	II.	*New York, N. Y.*	117 Berkeley St.
Feland, Logan	IV.	*Owensboro', Ky*	14 E. Chester Park.
Fitz, Charles Frederick, Jr.,	II.	*Watertown*	Watertown.
Francis, Frederick Leighton	IV.	*Fitchburg*	234 W. Canton St.

NAME.	COURSE.	HOME.	RESIDENCE.
French, Allen	IX.	*Boston*	200 Comm'th Ave.
French, Edward Rutledge	VI.	*Waterbury, Conn.*	75 Chandler St.
Fuller, Charles Edward	II.	*Wellesley*	Wellesley.
Gamble, William Burt	VI.	*Detroit, Mich.*	8 St. James Ave.
Gill, Edward Paddington	IV.	*Baltimore, Md.*	150 Huntington Ave.
Gilmore, Howard	II.	*North Easton*	North Easton.
Goodell, George Haskell	II.	*Salem*	Salem.
Gray, William Palmer	VI.	*Richmond, Va.*	150 Huntington Ave.
Green, William Wilcox	I.	*Blue Island, Ill.*	310 Columbus Ave.
Grimes, Charles Browning	V.	*East Boston*	55 Monmouth St., E. B.
Hall, Albert Percival	I.	*Chicago, Ill.*	33 St. James Ave.
Hall, Edward Childs, Jr.	II.	*Watertown*	Watertown.
Hawley, William Church	VI.	*Malden*	Malden.
Heywood, Albert Samuel	VI.	*Worcester*	149 Worcester St.
Holmes, Francis Clinton	IX.	*Plymouth*	17 Oakdale St., J. P.
Howland, Frederick Hoppin	I.	*Providence, R. I.*	33 St. James Ave.
Hoxie, Frederick Jerome	VI.	*Phenix, R. I.*	385 Columbus Ave.
Hutchinson, William Spencer	III.	*Mattapan*	44 Morton St., M.
Ingraham, George Hunt	IV.	*New Bedford*	East Milton.
Johnson, Jesse Folsom	X.	*Ipswich*	Danversport.
Johnston, William Atkinson	II.	*Belmont*	Belmont.
Kales, William Robert	II.	*Chicago, Ill.*	238 Huntington Ave.
Kendall, William Roy	VI.	*Kansas City, Mo.*	1 Yarmouth St.
Koch, Armand David	IV.	*Milwaukee, Wis.*	58 Chester Sq.
Lane, William Homer	VI.	*Medford*	Medford.
Locke, William Willard	XI.	*Lockeford, Cal.*	298 Columbus Ave.
Lukes, Joseph Bryan	VI.	*Racine, Wis.*	Hotel Chester.
Lyon, Joseph Palmer	I.	*Hanover, Conn.*	385 Columbus Ave.
Manahan, Elmer Gove	XI.	*Lawrence*	Lawrence.
Manley, Laurence Bradford	I.	*West Roxbury*	West Roxbury.
Mansfield, Richard Herbert, Jr.	VI.	*Lynn*	Lynn.
Marcy, Willard Adna	II.	*Newton Upper Falls*	Newton Upper Falls.
Mathews, Albert Prescott	VII.	*So. Evanston, Ill.*	708 Tremont St.
May, George Henry	V.	*Newton Centre*	Newton Centre.
McCaw, Wallace Eugene	VI.	*Macon, Ga.*	150 Huntington Ave.
McQuesten, George Edward	VI.	*Boston*	115 Newbury St.
Merrill, Frank Henry	X.	*Newburyport*	Newburyport.
Merrill, George Albert	XI.	*Newburyport*	Newburyport.
Messenger, William Henry	II.	*East Boston*	286 Princeton St., E.B.
Metcalf, Leonard	I.	*Cambridge*	Cambridge.
Miller, Herbert Stanley	VI.	*Elizabeth, N. J.*	152 W. Newton St.
Miller, Lilly	V.	*Charlestown*	33 Essex St., C.

NAME.	COURSE.	HOME.	RESIDENCE.
Morrill, Asa Hall	I.	*Neponset*	2 High St., N.
Newman, Frank Eaton . .	IV.	*Plainfield, N. J.* . .	83 Montgomery St.
Noyes, Edmund Horatio . .	X.	*Arlington*	Arlington.
Ober, Arthur Joseph . . .	I.	*West Medford* . . .	West Medford.
Otis, Hamilton	I.	*San Francisco, Cal.* .	430 Columbus Ave.
Paraschos, Nicolas Theophanes	I.	*Constantinople, Turkey*	453 Beacon St.
Parkes, Harry Charles . . .	III.	*Chicago, Ill.* . . .	137 W. Newton St.
Parrish, James Scott . . .	II.	*Richmond, Va.* . .	150 Huntington Ave.
Perkins, Frank Edson . . .	IV.	*Boston*	14 Appleton St.
Perry, John Cranston . . .	II.	*Providence, R. I.* .	54 Berkeley St.
Phillips, Henry Morton . .	VI.	*Wrentham*	298 Columbus Ave.
Pierce, Arthur Gilbert . . .	VI.	*East Boston* . . .	26 Bremen St., E. B.
Pope, Macy Stanton . . .	I.	*East Machias, Me.* .	5 Pelham St.
Pratt, Calvin Barton . . .	XI.	*Bridgewater* . . .	Mass. Gen. Hospital.
Pratt, Dana Moore	I.	*South Hanson* . .	So. Hanson.
Ranlett, Arthur Grover . .	III.	*San Francisco, Cal.* .	153 W. Canton St.
Rhodes, Frederick Leland .	VI.	*Winchester* . . .	Winchester.
Robertson, Andrew Robert .	II.	*Glasgow, Scotland* .	165 W. Canton St.
Robinson, Dwight Parker, A.B.	VI.	*Wareham*	Cambridge.
Rosewater, William Marcus .	II.	*Cleveland, Ohio* . .	25 Berwick Park.
Rowell, George Freeman . .	I.	*Peabody*	Peabody.
Sackett, Ward Myron, C. E.	VI.	*Meadville, Pa.* . .	52 Chandler St.
Sage, Henry Judson, B. A. .	VI.	*Cincinnati, Ohio* .	89 Charles St.
Sager, Oscar Frank . . .	II.	*Charlestown* . . .	52 School St., C.
Sargent, Albert Francis, Jr. .	I.	*Malden*	Malden.
Saunders, Robert Thomson .	I.	*Tacoma, Wash.* . .	92 Worcester St.
Shepherd, Frank Cummings	XI.	*Gloucester*	84 Chandler St.
Sherman, Le Roy Kempton .	I.	*Chicago, Ill.* . . .	26 Rutland Sq.
Shute, Harry Damon . . .	VI.	*Boston*	137 Newbury St.
Skinner, Theodore Hobart .	IV.	*Boston*	157 Newbury St.
Smith, Edwin Clarence . .	II.	*Newton*	Newton.
Sutton, Stansbury	II.	*Allegheny, Pa.* . .	33 St. James Ave.
Sweetser, Ralph Hayes . .	III.	*Portsmouth, N. H.* .	382 Longwood Av., R.
Taylor, Robert Robinson .	IV.	*Wilmington, N. C.* .	63 Fayette St.
Thalheimer, William Coolidge	I.	*Cincinnati, Ohio* .	Newton Centre.
Tidd, Winthrop Lowe . . .	II.	*Taunton*	Taunton.
Torossian, Toros Houhanes, B.A.	I.	*Roustchuk, Bulgaria*	613 Tremont St.
Tucker, Ross Francis . . .	IV.	*Oakland, Cal.* . .	58 Chester Square.
Vining, John Franklin . . .	IV.	*So. Weymouth* . .	So. Weymouth.
Wales, Thomas Crane, Jr. .	VI.	*Boston*	229 W. Chester Park.
Walker, Francis	I.	*Boston*	237 Beacon St.
Wallace, Charles Frederic .	VI.	*Roxbury*	62 Forest St., R.

NAME.	COURSE.	HOME.	RESIDENCE.
Warner, Murray	II.	*St. John, N. B.*	298 Columbus Ave.
Warren, William	I.	*Brighton*	Brighton.
Waterman, Richard, Jr.	IX.	*Chicago, Ill.*	202 Dartmouth St.
Webb, Harry Storrs	VI.	*Cincinnati, Ohio*	166 W. Canton St.
Weis, Samuel Washington	I.	*New Orleans, La.*	160 Huntington Ave.
Wells, Edward Castle	II.	*Quincy, Ill.*	153 W. Canton St.
Wendell, George Vincent	VIII.	*Cambridgeport*	Cambridgeport.
Wentworth, Charles T.	III.	*Roxbury*	46 Sherman St., R.
Westcott, Frank Thomas, Ph.B.	I.	*Hopedale*	Hopedale.
Wetherbee, George Henry, Jr.	I.	*E. Marshfield*	Newtonville.
Williams, Harry Nye	I.	*Cleveland, Ohio*	78 Huntington Ave.
Worthington, Arthur Morton	VII.	*Dedham*	Dedham.
Yoerg, Frank	IV.	*St. Paul, Minn.*	112 Pembroke St.
Yorke, George Marshall	VI.	*Lowell*	Lowell.

Second Year.

Abbot, John Cameron	VI.	*Westford*	137 Pembroke St.
Abbott, Frederic Bassett	VI.	*Lynn*	Lynn.
Adams, Frank William	I.	*Newtonville*	Newtonville.
Albee, Orton Wheelock	III.	*Marlboro'*	Marlboro'.
Alden, Herbert Watson	II.	*Pekin, Ill.*	44 Chandler St.
Allen, Charles Vernon	VI.	*Holliston*	110 Chandler St.
Anthony, John Gould	III.	*Cincinnati, Ohio*	20 Union Park.
Badger, Frank Sidney	I.	*Wellesley Hills*	Wellesley Hills.
Baker, Frederic Wallace	II.	*Newton*	Newton.
Ballard, Hetty Orrilla	XII.	*Roslindale*	152 Brown Ave., R.
Barbour, Minard Townsend	II.	*Chicago, Ill.*	402 Columbus Ave.
Barnes, William Thomas	I.	*South Boston*	773 Broadway, S. B.
Barrows, Irving McFarland	IV.	*Fairhaven*	20 Union Park.
Barstow, George Edward	II.	*Lynn*	Lynn.
Barton, Howard Rittenhouse	VI.	*Englewood, N. J*	200 Dartmouth St.
Beattie, Roy Hamilton	I.	*Fall River*	
Beddall, Albert Richard	VII.	*Chelsea*	Chelsea.
Bemis, Albert Farwell	I.	*Colorado Springs, Colo.*	33 St. James Ave.
Berry, Hereford	VI.	*North Andover*	North Andover.
Biscoe, Maurice Bigelow	IV.	*Westboro'*	20 Union Park.
Blake, Edmund Enos	II.	*Newton*	Newton.
Blood, Grosvenor Tarbell	VI.	*Newburyport*	Newburyport.
Boss, Charles Royce	IX.	*New London, Conn.*	14 Arlington St.
Boyd, James Churchill	III.	*Jamaica Plain*	Pond St., J. P.
Breed, Stephen Alec	II.	*Lynn*	204 Dartmouth St.

NAME.	COURSE.	HOME.	RESIDENCE.
Brockunier, Samuel Hugh	III.	*Wheeling, W. Va.*	58 Chester Square.
Brown, Charles Custer	I.	*Waltham*	Waltham.
Brown, John Clifford	VI.	*Portland, Me.*	33 St. James Ave.
Brown, Walter Vail	VI.	*Oldtown, Me.*	Hotel Lovejoy.
Buchanan, Leonard Brown	VI.	*Woburn*	Woburn.
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.
Chapman, Thomas Irvin	VI.	*Brookline*	Brookline.
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.	*Cotuit*	57 Marlboro' St.
Cox, Frederick Edward	IV.	*St. Louis, Mo.*	18 Durham St.
Craighill, Nathaniel Rutherford	II.	*Charlestown, W. Va.*	217 W. Canton St.
Cutler, William Worcester	VI.	*Waltham*	Waltham.
Dana, George Frink	X.	*Cincinnati, Ohio*	415 Columbus Ave.
Darrow, Courtland Rogers	I.	*New London, Conn.*	110 Chandler St.
Dates, Henry Baldwin	VI.	*New Britain, Conn.*	5 Concord Square.
Davis, William E., Jr.	IV.	*Englewood, Ill.*	58 Chester Square.
Day, Philip Baldwin	II.	*Charlestown*	Navy Yard, C.
Dearborn, George Knight	IX.	*Dorchester*	Harrison Sq., D.
Demond, Charles Denny	III.	*East Boston*	166 Webster St , E.B.
Densmore, Edward Dana	VI.	*Somerville*	Somerville.
Dillon, Frederick Nathan	V.	*Fitchburg*	217 W. Canton St.
Dixon, Laurence Belmont	VI.	*Chicago, Ill.*	165 W. Brookline St.
Dolan, Peter Francis	VI.	*East Boston*	185 Chelsea St., E. B.
Dorman, Theodore Taylor	X.	*Upper Montclair, N.J.*	2 St. James Ave.
Ellis, John	VI.	*Woonsocket, R. I.*	19 Upton St.
Emery, James Albert	I.	*Taunton*	Taunton.
Fabyan, Francis Wright	IX.	*Boston*	36 Beacon St.
Farwell, Arthur George	VI.	*St. Paul, Minn.*	19 Union Park.
Fay, Frederic Harold	I.	*Marlboro'*	76 Chandler St.
Forbes, Fred Bettinson	V.	*East Cambridge*	East Cambridge.
Fowle, Arthur Edwin	X.	*Newton Centre*	Newton Centre.
Gaylord, Wallace Kendall	V.	*Wellesley*	Wellesley.
Gorham, Marvine	II.	*Buffalo, N. Y.*	6 Louisburg Sq.
Guppy, George	II.	*Jamaica Plain*	12 Myrtle St., J. P.
Hadley, Frederick Walter	VI.	*Arlington Heights*	Arlington Heights.
Hagar, Edward McKim	II.	*Chicago, Ill.*	14 Harris Ave., J. P.
Hahn, William Irwin	II.	*East Boston*	35 Chelsea St., E. B.

NAME.	COURSE.	HOME.	RESIDENCE.
Hanchett, George Tilden	VI.	*Hyde Park*	Hyde Park.
Hawley, John Church	V.	*Malden*	Malden.
Hill, William Reed	IV.	*Milton*	Milton.
Hinckley, John Fred	X.	*Marlboro'*	76 Chandler St.
Houck, William Gabriel	I.	*Buffalo, N. Y.*	18 Durham St.
Howe, Josiah Wilder	I.	*New Haven, Conn.*	76 Chandler St.
Jackson, Daniel Dana	V.	*Lanesville*	Newtonville.
James, Lawrence Stearns	V.	*East Boston*	56 Trenton St., E. B.
Jameson, Arthur Hugh	VI.	*Winchester*	65 Appleton St.
Jones, Stephen Edward, Jr.	II.	*Louisville, Ky.*	148 Chandler St.
Keith, Simeon Curtis, Jr.	V.	*East Bridgewater*	76 Chandler St.
Kendall, Albert Lincoln	II.	*Framingham*	Framingham.
Kendall, Fay Brigham	VI.	*Roxbury*	40 Codman Park, R.
Kenison, Ervin	II.	*Chelsea*	Chelsea.
Kimball, Edward Richard, Jr.	II.	*Roxbury*	2 Lewis Park, R.
King, George Ilgenfritz	III.	*York, Pa.*	15 St. James Ave.
Knowlton, Willis Taylor	I.	*Malden*	Malden.
Lamb, William Franklin	VI.	*Roxbury*	23 Waumbeck St., R.
Lane, George H. Thomas	II.	*Cincinnati, Ohio*	2 Commonwealth Av.
Latey, Harry Nelson	VI.	*St. Louis, Mo.*	4 Oxford Terrace.
Latham, Harry Milton	II.	*Stoneham*	Stoneham.
Logan, John Wood	II.	*Bala, Pa.*	33 Yarmouth St.
Lord, Frederic Wait	VI.	*Boston*	8 Mt. Vernon St.
Lynch, Patrick Maurice	I.	*Holyoke*	85 Chandler St.
Maki, Heiichirō	VI.	*Tokyo, Japan*	28 Montgomery St.
Moody, Arthur Monroe	II.	*Newburyport*	Newburyport.
Moore, Arthur Lewis	II.	*Warren*	163 W. Chester Park.
Morrill, Harley Winslow	I.	*Neponset*	2 High St., N.
Morse, Charles Francis	I.	*Milford, N. H.*	41 Union Park.
Morss, Henry Adams	VI.	*Boston*	323 Marlboro' St.
Nichols, Henry Windsor	XII.	*Cohasset*	4 Bond St.
Noble, Walter Edwin	I.	*Newton Centre*	Newton Centre.
Noblit, Joseph Curtis	VI.	*Ogontz, Pa.*	33 Yarmouth St.
Norton, Charles Ladd	VI.	*Springfield*	11 Milford St.
Norton, Francis Cobb	IX.	*Rockland, Me.*	152 W. Newton St.
Page, Edward, Jr.	VI.	*Newtonville*	Newtonville.
Page, Edward Samuel	III.	*Melrose*	Melrose.
Page, William Brewster	II.	*Fitchburg*	129 Dartmouth St.
Parce, Joseph Yale, Jr.	II.	*De Land, Fla.*	91 Waltham St.
Parker, Edwin Mason	IV.	*West Acton*	West Acton.
Parks, Oren Elisha	I.	*Westfield*	1 Yarmouth St.
Parmiy, Dalton	II.	*Oceanic, N. J.*	57 Chandler St.

NAME.	COURSE.	HOME.	RESIDENCE.
Patch, Walter Woodbury	I.	*Roxbury*	18 Savin St., R.
Pettee, Eugene Everett	VI.	*Whitman*	Whitman.
Pevear, Arthur Stetson	VI.	*Cambridgeport*	Cambridgeport.
Phillips, Harry Milo	II.	*Keokuk, Ia.*	148 Chandler St.
Pickert, Leo Walter	V.	*Boston*	10 Greenville St.
Reed, James Henry, Jr.	VI.	*Boston*	3 Gloucester St.
Reynolds, Robert Duncan	II.	*Jamaica Plain*	45 Orchard St., J. P.
Rice, Harry Lawson	X.	*Lawrence*	295 Columbus Ave.
Richardson, Frank Douglas	II.	*Oak Park, Ill.*	14 Harris Ave., J. P.
Richmond, Harold Anthony	II.	*Providence, R. I.*	3 Oxford Terrace.
Sargent, Howard Rankin	IV.	*Newburyport*	Newburyport.
Sayward, William Henry, Jr.	IX.	*Dorchester*	69 Monadnock St., D.
Shurtleff, Arthur Asahel	II.	*Boston*	9 W. Cedar St.
Simonds, Frederic Pond	IV.	*Salem*	Salem.
Skinner, Fenwick Fenton	I.	*Boston*	2849 Washington St.
Smith, Arthur Blakeley	IX.	*Providence, R. I.*	249 Berkeley St.
Smith, Frederick Dexter	I.	*So. Framingham.*	So. Framingham.
Soley, William Alexander	III.	*Chelsea*	Chelsea.
Solomon, John Isaac	VI.	*New York, N. Y.*	26 Cumberland St.
Southard, Francis Marshall	VI.	*Brooklyn, N. Y.*	145 W. Newton St.
Speer, James Ramsey	II.	*Pittsburgh, Pa.*	15 St. James Ave.
Spofford, Charles Milton	I.	*Georgetown*	Georgetown.
Stose, George Willis	I.	*Chicago, Ill.*	115 Pembroke St.
Stowe, Lovell Baker	VI.	*Caryville*	13 Warren Ave.
Sutter, Frederick Charles	VI.	*Detroit, Mich.*	36 Holyoke St.
Swanton, Walter Irving	I.	*Gardiner, Me.*	45 Milford St.
Taintor, Charles	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*	148 Chandler St.
Thomas, Percy Holbrook	VI.	*Wayland*	Wayland.
Tomfohrde, John Frederic	II.	*Charlestown*	24 Mt. Vernon St., C.
Towne, Frederick Tallmadge	II.	*Stamford, Conn.*	6 Louisburg Square.
Tripp, Charles Albion	VI.	*Hudson*	44 Clarendon St.
Tucker, William Alfred	III.	*Roxbury*	55 Waverley St., R.
Vorce, Walter Herbert	VI.	*Farmington, Conn.*	78 Huntington Ave.
Wadsworth, Augustus Baldwin	VII.	*Plainfield, N. J.*	249 Berkeley St.
Walker, Geo. Lounsbury, B. S.	I.	*New York, N. Y.*	48 Union Park.
Wallis, Robert Norcross	IX.	*Fitchburg*	146 Chandler St.
Wason, Rigby	VI.	*Girvan, Scotland*	471 Columbus Ave.
Whitaker, Samuel Edgar, A.B.	VI.	*Portland, Me.*	39 Holyoke St.
Wilder, Parker Hastings	VI.	*Cincinnati, Ohio*	121 Beacon St.

NAME.	COURSE.	HOME.	RESIDENCE.
Wilson, Harry Colby	II.	*Nahant*	Nahant.
Woodbridge, Jonat'n Edwards	VI.	*Duluth, Minn.*	29 St. James Ave.
Woods, Henry Tyler	II.	*Somerville*	Somerville.

First Year.

Abbot, Charles Greeley	*Wilton, N. H.*	12 Forest St., R.
Adams, Raleigh Bullard	*Dorchester*	2 Gleason St., D.
Alexander, Henry Edward Mansfield	*Honolulu, H. I.*	58 Chester Sq.
Ames, Azel, 3d.	*Wakefield*	Wakefield.
Anderson, George Herbert	*Newburyport*	Newburyport.
Anderson, Richard Clough	*Cincinnati, Ohio*	303 Columbus Ave
Armistead, Frank Noble	*Portsmouth, Va.*	30 Dartmouth St.
Bailey, Roland	*Kingston*	Kingston.
Baker, Fred Charles	*Waltham*	Waltham.
Barker, Edgar Harrison	*Lawrence*	21 St. Charles St.
Barnard, Theodore Otis	*Roxbury*	11 Lambert Ave, R.
Batcheller, Henry Renssaelaer	*Charlestown*	34 Monument Sq., C.
Bates, Harry Reyburn	*Washington, D. C.*	36 Temple St.
Batson, Walter Vennard	*Watertown*	Watertown.
Beach, Charles Burr	*Dubuque, Ia.*	71 Rutland St.
Beach, Irving Everett	*Lawrence*	134 Huntington Ave.
Beardsell, George Richardson, Jr.	*Hudson, Mich.*	Lynn.
Benedict, Vallette Lyman	*Boston*	150 Huntington Ave.
Bennett, Robert Magill	*Cincinnati, Ohio*	308 Columbus Ave.
Bigelow, Frederick Southgate	*Boston*	334 Shawmut Ave.
Binney, James Alfred	*Roxbury*	153 Highland St., R.
Blake, Samuel Henry	*Whitman*	Whitman.
Blake, William Gaines	*New Orleans, La.*	157 Boylston St.
Blanc, Samuel Peters	*New Orleans, La.*	Cambridge.
Bliss, Walter Danforth	*Carson City, Nev.*	518 Columbus Ave.
Blume, Carlos Alberto	*Lima, Peru*	2 Commonwealth Av.
Bovey, William Howard	*Minneapolis, Minn.*	383 Columbus Ave.
Bowers, Charles Edwin	*Buenos Ayres, Arg. Rep.*	12 St. James Ave.
Bowles, Charles Wilson	*Ponkapog*	Ponkapog.
Brown, Harry Albertus	*Salmon Falls, N. H.*	314 Shawmut Ave.
Burnham, Frederic Henry	*Ottumna, Ia.*	324 Shawmut Ave.
Burrows, William Russell	*Lynn*	Lynn.
Campbell, James Fairman	*Bayside, N. Y.*	22 Yarmouth St.
Carlton, Jesse Clyde	*Atlanta, Ga.*	25 Warren Ave.
Carter, Philip Greenleaf	*New York, N. Y.*	295 Columbus Ave.
Case, Winthrop Tracy	*Canton Center, Conn.*	58 Pinckney St.

NAME.	HOME.	RESIDENCE.
Chace, Mason Smith	*Dorchester*	31 Wales St., D.
Chapman, John Winslow, Jr.	*Hyannis*	65 Chandler St.
Chapman, Nathan Coleman Winslow	*Hyannis*	65 Chandler St.
Chase, Harold Mayson	*Lowell*	56 Clarendon St.
Cheney, Nathan	*Boston*	136 Chandler St.
Chickering, Arthur Percy	*No. Andover Depot*	No. Andover Depot.
Claflin, Alan Avery	*Quincy*	19 Chester Park.
Clark, William Lewis	*Arlington*	Arlington.
Clarke, Edward Dutton	*Buffalo, N. Y.*	Hotel Huntington.
Clarke, Fred Hamilton	*Jamestown, R. I.*	132 Huntington Ave.
Clement, Arthur Austin	*Chicago, Ill.*	89 Charles St.
Coles, Walter Smith	*Cincinnati, Ohio*	11 St. James Ave.
Colman, Frederick William	*No. Andover Depot*	No. Andover Depot.
Cook, Frank Remick	*Detroit, Mich.*	Woburn.
Coolidge, Prescott Hilton	*So. Framingham*	So. Framingham.
Copeland, Henry Fillmore	*Brooklyn, N. Y.*	4 St. James Ave.
Couch, Oscar Roberts	*Pittsfield*	373 Columbus Ave.
Cousins, Sterling Green	*Fortuna, Cal.*	269 Columbus Ave.
Cowles, John Hill	*Gloversville, N. Y.*	190 W. Canton St.
Crary, Horace Allen	*Sheffield, Pa.*	112 Dartmouth St.
Cromwell, Martin John	*Baltimore, Md.*	78 Huntington Ave.
Crossen, Fred John	*Cobourg, Ont.*	145 W. Newton St.
Cutler, Charles Henry	*So. Framingham*	So. Framingham.
Cutter, Leonard Taylor	*Nashua, N. H.*	126 Berkeley St.
Daggett, Walter Crosswell	*W. Somerville*	W. Somerville.
Dalton, Nelson Wait	*Sandy Hill, N. Y.*	Lynn.
Dana, Leslie	*Kirkwood, Mo.*	19 St. James St.
Davies, Theophilus Clive	*Southport, England*	27 St. James Ave.
Davis, Leon Keith	*West Newton*	West Newton.
Dejonge, Alfred Louis	*Stapleton, N. Y.*	73 Cedar St., R.
Dickey, Charles William	*Haiku, Maui, H. I.*	58 Chester Sq.
Doughty, Stewart Brown	*Englewood, N. J.*	192 Dartmouth St.
Drake, Albert Wesley	*No. Cambridge*	No. Cambridge.
Duckworth, Harry Stafford	*Lowell*	Lowell.
Dumaresq, Philip	*Brookline*	Brookline.
Dunbar, Albert	*Pittsfield*	109 Warren Ave.
du Pont, Henry Belin	*Philadelphia, Pa.*	226 W. Canton St.
Dyer, John, Jr.	*Chicago, Ill.*	Brookline.
Eaton, Everett Lawrence	*Needham*	Needham.
Edwards, Ariel Ballou	*Woonsocket, R. I.*	164 Huntington Ave.
Edwards, Henry Emmer	*Washington, C. H., Ohio*	22 Yarmouth St.
Farnsworth, Arthur Jay	*Minneapolis, Minn.*	383 Columbus Ave.
Ferguson, John Neil	*Readville*	Readville.

NAME.	HOME.	RESIDENCE.
Flint, Richard Hall	*San Juan, Cal.*	14 Arlington St.
Foster, Harold Abbott	*No. Brookfield*	307 Columbus Ave.
Fowle, Frederick Eugene, Jr.	*Arlington*	Arlington.
Gallup, Hattie Tooker	*Ledyard, Conn.*	127 Charles St.
Gardner, Harry Wenthworth	*Roxbury*	8 Hotel Dale, R.
Gardner, Henry	*Salem*	Salem.
Gilbert, Perley Fred	*Andover*	Andover.
Gilkey, Royal Waldo	*Watertown*	Watertown.
Gilmore, Franklin Chester	*Lynn*	Lynn.
Gilpin, Charles Edward	*Washington, D. C.*	12 St. James Ave.
Gough, John B.	*Providence, R. I.*	277 Columbus Ave.
Green, Francis Cushing	*Boston*	117 Marlboro' St.
Greenleaf, Lewis Stone	*Lenox*	67 Elm St., J. P.
Habberley, Albert Nathaniel	*Hyde Park*	Hyde Park.
Hall, Sarah Abbie	*Roxbury*	Hotel Adelphi, R.
Hamblet, Clement Arthur	*Lowell*	Lowell.
Harding, Harry Brewer	*Boston*	5 Worcester Sq.
Harring, George William	*W. Roxbury*	Spring St., W. R.
Harrison, Burt Sylvanus	*La Crosse, Wis.*	49 Revere St.
Harwood, Frederick William, Jr.	*Springfield*	11 Milford St.
Hastings, Harry Payson	*So. Framingham*	So. Framingham.
Haven, George Bartholomew	*Sangerfield, N. Y.*	162 W. Springfield St.
Hazelton, Isaac Brewster	*Wellesley Hills*	Wellesley Hills.
Hickey, William James	*Boston*	175 Chambers St.
Hill, William Gilbert, Jr.	*Malden*	Malden.
Holden, Amasa Amidon	*Malden*	Malden.
Holden, Ben Edwin	*Aurora, Ill.*	101 Pinckney St.
Holden, Frank Howell	*Aurora, Ill.*	101 Pinckney St.
Holder, Jesse Morgan	*Lynn*	Lynn.
Hollister, John James	*Santa Barbara, Cal.*	58 Chester Sq.
Horton, Theodore	*Newport, R. I.*	73 Pinckney St.
Howes, Clifton Armstrong	*Cambridgeport*	Cambridgeport.
Hubbard, Charles Bela	*Lyndon, Vt.*	9 Rutland Sq.
Hunt, Albert Francis, Jr.	*Newburyport*	Newburyport.
Hyler, William Bowdoin	*Thomaston, Me.*	2 Commonwealth Av.
Janvrin, Ned Herbert	*Somerville*	Somerville.
Janvrin, Walter Adams	*Revere*	Revere.
Jenckes, Earl Stanton	*Woonsocket, R. I.*	16 Upton St.
Jenney, Warren	*Brookline*	Brookline.
Johnson, Henry Herbert	*Lawrence, Kansas*	Dedham.
Johnson, William Arthur	*Jamestown, R. I.*	27 Buckingham St.
Johnston, Morris Leidy	*Chicago, Ill.*	11 St. James Ave.
Kimball, Joseph Harris	*Newburyport*	Newburyport.

NAME.	HOME.	RESIDENCE.
Kimberly, James Cheney	*Neenah, Wis.*	120 Appleton St.
King, William Herbert	*Melrose*	Melrose.
Kirk, Robert Horner	*St. Paul, Minn.*	19 Union Park.
Kittredge, John Woodman	*Alnwick, Colo.*	39 Milford St.
Knapp, Charles Reay	*Louisville, Ky.*	120 Appleton St.
Kuki, Maru Takateru	*Kôbe, Japan*	43 Union Park.
Labouisse, John Peter	*New Orleans, La.*	157 Boylston St.
Lacount, Henry Osgood	*W. Somerville*	W. Somerville.
La Motte, Arthur	*Wilmington, Del.*	138 Chandler St.
Landauer, Harry	*Milwaukee, Wis.*	295 Columbus Ave.
Lane, Lucius Page	*Boston*	623 Tremont St.
Leiper, George Neville	*Philadelphia, Pa.*	327 Columbus Ave.
Leonard, Frederick Meehan	*Jamaica Plain*	165 Green St., J. P.
Locke, John Calvin	*Lockeford, Cal.*	298 Columbus Ave.
Lockwood, Charles Eastman	*Boston*	386 Marlboro' St.
Loring, Robert	*So. Boston*	789 Broadway, S. B.
Lovejoy, Frank William	*Boston*	Hotel Gladstone.
Lucia, Daniel Baldwin	*Montpelier, Vt.*	33 Yarmouth St.
Lynch, Albert Johnson	*Jamaica Plain*	Alden, Pl., J. P.
MacClure, Colbert Anderson	*Delphi, Ind.*	Hyde Park.
Mackay, Angus Robert	*Montreal, P. Q.*	198 Beacon St.
Mahony, Marion Lucy	*Chicago, Ill.*	Cambridge.
Marvell, Edward Ira	*Fall River*	47 Rutland Sq.
Maxwell, Frank Flagg	*Fernandina, Fla.*	Arlington.
McCabe, James	*Charleston, S. C.*	Stanley St., D.
McCullough, Harrie Bruce	*Cincinnati, Ohio*	2 Commonwealth Av.
McJennett, William Dargon	*Norwich, Conn.*	9 Cortes St.
McKibben, Frank Pape	*Van Buren, Ark.*	57 Chandler St.
McLaren, George Saunders	*Milwaukee, Wis.*	148 Warren Ave.
Meade, Charles Arthur	*Millerton, N. Y.*	57 Chandler St.
Melluish, James George	*Bloomington, Ill.*	200 Dartmouth St.
Mink, Edward	*W. Somerville*	W. Somerville.
Moore, Leslie Rogers	*Newton*	Newton.
Morison, Nathaniel Holmes, Jr.	*Ilchester, Md.*	46 Chestnut St.
Moulton, Raymond Edward	*Paris, France*	136 Boylston St.
Mower, George Lane	*Lynn*	Lynn.
Murkland, Frank Hatch	*New Bedford*	56 Clarendon St.
Nagle, George Henry	*Boston*	13 Cortes St.
Newhouse, Henry Leopold	*Chicago, Ill.*	7 Holyoke St.
Newman, Arthur Brantley	*Shreveport, La.*	1 Cortes St.
Nichols, George Abram	*Fitchburg*	146 Chandler St.
Nichols, Walter Bancroft	*Reading*	Reading.
Nowell, John Chase	*Reading*	Reading.

NAME.	HOME.	RESIDENCE.
Ober, Ralph Hadlock	*Beverly*	24 Milford St.
Owen, George, 3d	*Providence, R. I.*	80 Pinckney St.
Parker, Horatio Newton	*Cambridge*	Cambridge.
Parker, Winthrop Dana	*Reading*	Reading.
Patrick, Arthur Loomis	*West Newton*	West Newton.
Pechin, John Shelley	*Cleveland, Ohio*	200 Dartmouth St.
Peet, William Creighton	*New Orleans, La.*	2 St. James Ave.
Perry, Philip Edward	*Jamaica Plain*	10 Gordon St., J. P.
Phelan, Joseph Warren	*East Boston*	63 Lexington St., E.B.
Pike, Alexander Rea	*Brookline*	Brookline.
Piper, Walter Elbridge	*Hyde Park*	Hyde Park.
Piper, William Benjamin	*Dorchester*	2 Winter St., D.
Pollock, Clarence Dubois	*Washington, D. C.*	36 Temple St.
Pratt, Wallace William	*Hingham Centre*	Hingham Centre.
Pratt, William Hemmenway	*Waltham*	Waltham.
Prescott, Samuel Cate	*South Hampton, N. H.*	Cambridge.
Price, Raymond Beach	*Boston*	Hotel Flower.
Proctor, Richard Warren	*Billerica*	Billerica.
Randall, Albert Winslow	*Waltham*	Waltham.
Randall, Edward Bryant	*Medford*	34 Hancock St.
Ray, Gano	*Cincinnati, Ohio*	Hotel Bellevue.
Reed, Samuel Gordon	*Rockland*	Rockland.
Reed, Walter Wilson	*Waltham*	Waltham.
Reynolds, Howard Sidney	*Randolph*	Randolph.
Richards, Daniel W., Jr.	*Needham*	Needham.
Richards, Russell Almon	*Newton Highlands*	Newton Highlands.
Richards, Thomas Gleason	*Roxbury*	36 Lambert St., R.
Ripley, Henry Francis	*Hingham Centre*	Hingham Centre.
Robb, Aubrey Granger	*Amherst, N. S.*	666 Tremont St.
Robbins, Franklin Henry	*Kingston*	Kingston.
Rogers, Arthur Silas	*Salem*	Salem.
Rogers, John Arthur	*Chicago, Ill.*	303 Columbus Ave.
Rollins, George Oscar	*North Brookfield*	111 Pembroke St.
Ross, Donald William	*Montreal, Can.*	544 Columbus Ave.
Ruddick, Jesse Hicks	*Boston*	195 Huntington Ave.
Russell, Harry Browning	*Brockton*	Brockton.
Sanderson, Nathan Herbert	*Waltham*	Waltham.
Sargent, Charles Grandison	*Graniteville*	137 Pembroke St.
Savage, Silas Anthony	*Chelsea*	Chelsea.
Sawyer, Albert Haydn	*Newburyport*	Newburyport.
Schiertz, Ferdinand	*Auburndale*	Auburndale.
Scott, Walter Osgood	*Providence, R. I.*	28 Cortes St.
Sheppard, Robert Kimball	*Newton*	Newton.

NAME.	HOME.	RESIDENCE.
Sherman, George Wilmarth	*Fall River*	1 Yarmouth St.
Souther, John Kerfoot	*Fredericksburg, Va.*	19 Upton St.
Spalding, Willard Floyd	*Lynn*	502 Columbus Ave.
Sperry, Austin	*San Francisco, Cal.*	150 Chandler St.
Starbird, Harry Coolidge	*Malden*	Malden.
Stearns, Fred L.	*Hopkinton*	So. Framingham.
Stevens, John Conyngham	*Philadelphia, Pa.*	95 Mt. Vernon St.
Stork, William Boteler	*Andover*	41 Union Park.
Story, John Patten, Jr.	*Fortress Monroe, Va.*	46 Chestnut St.
Stratton, George Eber	*Shelburne Falls*	Brookline.
Sturgis, Russell, 2d	*New York, N. Y.*	15 St. James Ave.
Swanton, Henry Aiken	*Gardiner, Me.*	45 Milford St.
Taber, George Aymar	*Montrose*	Montrose.
Tarbox, John Watson	*Nashville, Tenn.*	20 W. Cedar St.
Taylor, George	*Brookline*	Brookline.
Taylor, William Bellamy	*Brookline*	Brookline.
Tenney, Albert Ball	*Everett*	Everett.
Thomas, William Bacon	*Stockton, Cal.*	379 Columbus Ave.
Thomson, Samuel Forsythe	*Charleston, S. C.*	Salem.
Thorndike, Sturgis Hooper, A. B.	*Cambridge*	Cambridge.
Thropp, Joseph Earlston, Jr.	*Philadelphia, Pa.*	327 Columbus Ave.
Tidd, Arthur Warren	*No. Woburn*	No. Woburn.
Tufts, Leonard	*Medford*	Medford.
Unruh, David Spencer	*Arcadia, Cal.*	190 W. Canton St.
Valentine, James Clark	*Framingham*	Framingham.
Varney, Fred Lane	*Lynn*	Lynn.
Varney, Theodore	*Watertown*	502 Columbus Ave.
Wade, John Ross	*Hulton, Pa.*	112 Mt. Vernon St.
Waite, Edward Broughton	*West Newton*	West Newton.
Warren, Harry Ellis	*Newton Centre*	Newton Centre.
Wheeler, Robert Charles	*Temple, N. H.*	11 Harwich St.
Wheildon, William Maxwell	*Stoneham*	425 Beacon St.
White, Harry Clinton	*Melrose*	Melrose.
Whiting, Howard Earl	*Cambridge*	Cambridge.
Whitney, Harry Hayden	*Brookline*	Brookline.
Whiton, Chauncey Gilbert	*Hingham Centre*	Hingham Centre.
Wood, Kenneth Foster	*Central Falls, R. I.*	Central Falls, R. I.
Wray, John Edward	*St. Louis, Mo.*	150 Warren Ave.
Wrightington, Charles Nelson	*Brookline*	Brookline.
Yoerg, Henry	*St. Paul, Minn.*	112 Pembroke St.
Young, John Mansfield, Jr.	*Madison, N. J.*	202 Dartmouth St.
Zentgraf, Otto Louis	*Stapleton, N. Y.*	73 Cedar St., R.

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	Elect.	Electrical Engineering.	Met.	Metallurgy.
Arch.	Architecture.	El. Fr.	Elementary French.	Mil.	Military Drill.
Arch. (part.),	Partial course in Architecture.	Eng.	English.	Min.	Mining Engineering.
Ast.	Astronomy.	Fr.	French.	Org. Chem.	Organic Chemistry.
Biol.	Biology.	Geol.	Geology.	Phys.	Physics.
B. A.	Blowpipe Analysis.	Germ.	German.	Physiol.	Physiology.
Chem.	General and Analytic Chemistry.	H. and V.	Heating and Ventilation.	P. E.	Political Economy.
Civ. Eng.	Civil Engineering.	Hist.	History.	Pol. Sci.	Political Science.
Clim.	Climatology.	Ind. Chem.	Industrial Chemistry.	R. R. Man.	Railroad Management.
Com. Geog.	Commercial Geography.	Lit.	Literature.	Shop.	Shopwork.
Dr.	Drawing	Math.	Mathematics.	Sp.	Spanish.
D. G.	Descriptive Geometry.	Mech.	Mechanism.	Surv.	Surveying.
Econ.	Economics.	Mech. Eng.	Mechanical Eng.	Th. Chem.	Theoretical Chemistry.
		M. and A.	Mechanics and Acoustics.	Zoöl.	Zoölogy.

NAME.	HOME.	RESIDENCE.
Adams, Arthur Henry, S. B. Chem., Elect., Ind. Chem., Org. Chem., Phys.	*Newton*	Newton.
Adams, William Hussey Chem., Ind. Chem., Org. Chem., Phys. Lab., Text. Color.	*Newburyport*	Newburyport.
Aiken, John Dr., Math., Shop.	*Norwich, Conn.*	Dedham.
Allen, Orren App., Mech., Elect., Fr., Lit, Mech. Eng., Phys.	*Denver, Colo.*	507 Columbus Ave.
Alley, Arthur Humphreys Anthrop., Econ., Fr., Germ., Lit.	*Jamaica Plain*	Revere St., J. P.
Andrews, Edmund Lathrop Acous., Math., Mech., Phys., P E., Shop.	*Chicago, Ill.*	238 Huntington Ave.
Andrews, George William Arch. (part.)	*Cleveland, Ohio*	Auburndale.
Annandale, William Edwin Dr., Eng., Fr., Math., Shop.	*Dunbar, Scotland*	84 Charles St.
Armstrong, Herbert Chem., Dr., El. Fr., Math, Shop.	*Detroit, Mich.*	36 Holyoke St.
Ashton, Franklin George Chem., D. G., Germ., Math, Phys., P. E., Shop.	*Somerville*	Somerville.
Baldwin, Harry Alexander Dr, Eng., Fr., Math.	*Haiku, Maui, H. I.*	58 Chester Sq.
Bartlett, Herbert Warren Dr, Fr., Math., Mil.	*North Weymouth*	North Weymouth.

NAME.	HOME.	RESIDENCE.
Bartlett, Joseph Gardner . . . Arch. (part.)	*Chestnut Hill* . . .	Chestnut Hill.
Bassett, George Oliver . . . . Chem., Fr., Org. Chem., Text. Color.	*Sandwich*	Lynn.
Baxter, Jesse Bunton . . . . Chem., Germ., Math., Phys., P. E.	*East Milton*	East Milton.
Belden, Richard Edwin . . . D. G., El. Fr., Math., Phys., P. E., Shop.	*New London, Conn.* .	35 Union Park.
Bissell, Robert Wilson . . . . App. Mech., Civ. Eng., Geol., Math., Met., Phys. Lab.	*Pittsburgh, Pa.* . . .	8 St. James Ave.
Blair, Joshua Brown . . . . . Arch. (part.)	*Worcester*	Worcester.
Bliss, Clara A. . . . . Biol., Chem., Phys. Lab.	*Newburyport*	83 Montgomery St.
Blume, John Christopher . . . App. Mech., Ind. Chem., Lit., Mech. Eng., Org Chem., Phys.	*Lima, Peru*	2 Commonw'th Ave.
Bonesteele, Frank P. . . . . Dr., Eng., Germ., Math., Mil.	*Rochester, N. Y.* . .	39 Falmouth St.
Bourne, Phillips Payson . . . App. Mech., Germ., Math., Mech. Eng., Phys., Shop.	*Foxboro'*	Foxboro'.
Braman, Samuel Noyes . . . App. Mech., Germ., Math., Mech. Eng., Phys., Shop.	*Wayland*	Wayland.
Breed, Stephen Lovejoy . . . Chem., D. G., El. Fr., P. E., Shop.	*Lynn*	200 Dartmouth St.
Briggs, Fred Hendrick . . . . Arch. (part.)	*Rochester, N. Y.* . .	290 Columbus Ave.
Brooks, Thomas Musgrave . . App. Mech., Germ., H. and V., Mech. Eng., Met., Shop.	*South Sudbury* . . .	South Sudbury.
Brooks, Warren Everett . . . Chem., D. G., Germ., Math., P. E., Shop.	*Boston*	Hotel Flower.
Brown, Frank Elwood . . . . Arch. (part.)	*Amherst*	133 W. Concord St.
Brown, Glenn Charles . . . . App. Mech., Chem., Germ., Math., Phys.	*Tower, Minn.* . . .	140 Beacon St.
Buchholz, Charles Egmont . . App. Mech., Civ. Eng., Geol., Germ. Lit., Math., Phys.	*Hempstead, N. Y.* . .	35 St. James Ave.
Bugbee, Lucian Willis . . . . Dr., Shop.	*Southbridge*	533 Columbus Ave.
Burbank, Robert Sumner . . . Chem., Dr., Germ., Math., P. E.	*Waverly*	Waverly.
Burrage, Severance . . . . . Anthrop., Biol., Chem., Germ., Org. Chem., Phys.	*West Newton*	West Newton.
Burrough, Horace, Jr. . . . . Ind. Chem., Met., Org. Chem., Phys., San., Chem.	*Baltimore, Md.* . . .	471 Columbus Ave.
Burtt, Arthur Morton . . . . Arch. (part.), P. E.	*Lowell*	Lowell.
Cadwell, William Harry . . . D. G., Math., Mech., Phys., Shop.	*Nashua, N. H.* . . .	295 Columbus Ave.
Calkins, Leighton, A. B. . . . D. G., Dr., Math., Phys., Shop.	*Newton*	Newton.

NAME.	HOME.	RESIDENCE.
Carlson, Harry John . . . . . Arch., Ast., Fr., H. and V., Phys.	*St. Paul, Minn.* . . .	Newton Centre.
Carney, George Sydney . . . D. G., Germ., Math., Mech., Phys., P. E.	*Lowell*	Lowell.
Carter, Marion Hamilton . . . Biol.	*Philadelphia, Pa.* . .	96 Charles St.
Chapin, George Edwin . . . . Acous., Germ., Lit., Math., Mech., Phys.	*Charlestown*	32 Chestnut St., C.
Chase, Henry Mayo . . . . . App. Mech., Mech. Eng., Phys., Shop.	*Holyoke*	144 W. Newton St.
Christian, Arthur . . . . . Assaying.	*Dorchester*	Crescent Ave., D.
Churchill, Wesley Brainard . . Dr., Shop.	*Somerville*	Somerville.
Clark, Arthur Henry . . . . Chem., Dr., Eng., El. Fr., Math., Mil.	*Cedar Rapids, Ia.* . .	214 Columbus Ave.
Clark, Charles Hiram . . . . App. Mech., Fr., H. and V., Mech. Eng., Met., Phys., Shop.	*Thorndike*	146 Chandler St.
Clark, Clara May, A. B. . . . Clim., Geol., Lith.	*Northampton*	10 Columbus Sq.
Clarke, John Charles . . . . Dr., Shop.	*Manchester*	Manchester.
Clarke, Prescott Orloff, B. P. . Arch., D. G.	*Providence, R. I.* . .	24 Kenilworth St., R.
Clough, Albert Lucien . . . . App. Mech., Elect. Eng., Math., Phys.	*Manchester, N. H.* .	190 W. Brookline St.
Cogswell, Charles Perkins, Jr. . App. Mech., Civ. Eng., Germ., Math., Met., Shop.	*Norwich, Conn.* . . .	6 Berwick Park.
Conant, Charles Leonard . . . Dr., Shop.	*Auburn, Me.*	57 Hancock St.
Cook, Charles Nourse . . . . Chem., D. G., Germ., Lit., Math., Mech., Phys.	*Woonsocket, R. I.* . .	41 Mt. Vernon St.
Crosby, William Wyman . . . D. G., Germ., Math., Mech., Phys., Shop.	*Woburn*	Woburn.
Cushing, Robert Delano . . . App. Mech., Elect., Fr., Math., Mech. Eng., Phys. Lab.	*Lunenburg*	148 Chandler St.
Daggett, Herbert Chapin . . . App. Mech., Civ. Eng., Met., San. Eng.	*Foxcroft, Me.* . . .	3 Dover St.
Daniell, Joshua, S. B. . . . . Germ., Math., Met., Min., Phys.	*Opechee, Mich.* . . .	302 Columbus Ave.
Davis, Charles Larkin . . . . Dr.	*Milton*	Milton.
Davis, Frank Irvin . . . . . App. Mech., Arch., Geol., Germ., Lit., Math., Phys.	*East Boston*	191 Trenton St., E. B.
Dawes, Herbert Nathan . . . Chem., D. G., Germ., Math., Mech., Phys., P. E., Shop.	*Chelsea*	Chelsea.
de Carvalho, Raul Rezende . . Arch., Econ., Geol., Germ., Hist., Lit., Math., Phys.	*Rio de Janeiro, Brazil.*	330 W. Chester Park.
Dennett, James Vaughan . . . Arch., D. G., Germ., P. E.	*Saco, Me.*	58 Chester Sq.

NAME.	HOME.	RESIDENCE.
Dennis, Chester Warner. Chem., Dr., Eng., Fr., Mil.	*Lynn*	Lynn.
Dodge, Samuel Douglass. App. Mech., Civ. Eng., Geol., Germ., Lit., Math., Phys.	*Arlington*	Arlington.
Doe, Haven. App. Mech., Elect., Germ., Lit., Math., Mech., Phys.	*Salmon Falls, N. H.*	303 Columbus Ave.
Dow, Florence. Chem., Eng., Germ.	*Exeter, N. H.*	312 Columbus Ave.
Draper, Charles Wardwell. Arch. (part.)	*Helena, Montana*	533 Columbus Ave.
Dufort, Joseph Cajetan. Arch. (part.)	*Montreal, Can.*	46 Union Park.
Duncan, Robert Jones. Chem., D. G., Math., Phys., Shop.	*Englewood, N. J.*	162 Huntington Ave.
Dutton, William Stillman. Arch. (part.)	*Cleveland, Ohio*	73 Pinckney St.
Eaton, Maria S. Math.	*Worcester*	Cambridge.
Estey, Julius Gray. Dr., Shop.	*Brattleboro', Vt.*	Hotel Huntington.
Esty, William, A. B. App. Mech., Elect., Germ., Lit., Math., Mech. Eng., Phys.	*Amherst*	10 Columbus Sq.
Evans, Wilbur Forbes. Chem., D. G., Fr., Germ., Math., P. E., Shop.	*Springfield*	149 Worcester St.
Evans, William Eugene. Arch. (part.)	*Jamaica Plain*	South St., J. P.
Fairfield, Edmund John. Chem., D. G., Germ., Math., Mech., Phys., P. E., Shop.	*Hartford, Conn.*	5 Columbus Sq.
Falvey, John Joseph. App., Mech., Civ. Eng., Geol., Germ., Lit., Math., Phys.	*East Somerville*	East Somerville.
Fenner, Burt L. Arch. (part.)	*Rochester, N. Y.*	290 Columbus Ave.
Fitts, Frederic Whitney. Arch. (part.)	*Somerville*	Somerville.
Forbush, Gayle Tilton. App. Mech., Chem., Germ., Ind. Chem., Math., Mech. Eng., Org. Chem., Phys.	*Natick*	Natick.
Forsyth, Herbert. Arch. (part.), Phys.	*Lebanon, N. H.*	Cambridgeport.
Foster, Francis Homer, B. S. Civ. Eng., D. G., Geol., Germ., Math.	*Andover*	273 Columbus Ave.
Fox, Charles Eli. Arch. (part.)	*Reading, Pa.*	149 Worcester St.
Frank, George W., Jr. Arch. (part.)	*Kearney, Nebr.*	Hotel Flower.
Frisbie, Walter Levi. Germ., Math., Mech., Phys., Shop.	*Waterbury, Conn.*	223 W. Canton St.
Gardner, John Howland. Chem., D. G., El. Fr., Math., Mech., Phys., P. E., Shop.	*New London, Conn.*	4 Union Park.
Garlichs, Charles Frederick. Arch. (part.)	*Washington, D. C.*	87 Appleton St.

NAME.	HOME.	RESIDENCE.
Garstang, Charles Edward . . Arch. (part.)	*Davenport, Ia.* . . .	234 W. Canton St.
Gilchrist, Clarence Dyer . . . Arch. (part.)	*Evansville, Ind.* . .	14 Chester Park.
Glidden, George Blanchard . . Chem., Dr., Eng., Germ., Math., Mil., Shop.	*Roxbury*	23 Greenville St., R.
Godchaux, Jules . . . . . Chem., D. G., Dr., Math., P. E., Phys., Shop.	*New Orleans, La.* . .	162 Huntington Ave.
Goetzmann, Albert Lee . . . D. G., Geol., Germ., Lit., Math., Phys., Surv.	*Boone, Ia.*	149 Worcester St.
Gottlieb, Albert Samuel . . . App. Mech., Arch., Math., Mech. Eng., Phys.	*Brooklyn, N. Y.* . .	202 Dartmouth St.
Grabau, Amadeus William . . Chem.	*Buffalo, N. Y.* . . .	87 Appleton St.
Graves, William Hagerman, B. L. Arch., D. G., Geol., H. and V.	*Milwaukee, Wis.* . .	Cambridge.
Greene, Frank . . . . . Dr., El. Fr., Eng., Math.	*Cedar Rapids, Ia.* . .	214 Columbus Ave.
Grover, Nathan Clifford, B. C. E. Civ. Eng., San. Eng.	*West Bethel, Me.* . .	370 Shawmut Ave.
Hall, John Wentworth . . . . Arch. (part.)	*Roxbury*	8 Hillside St., R.
Hammond, Alonzo John, B. S. . Biol., Chem., Civ. Eng., Fr., H. and V., San. Eng.	*Frankfort, Ind.* . . .	35 Warren Ave.
Harris, John Luther, S. B. . . Chem., Geol., Met., Min.	*Hancock, Mich.* . . .	144 Boylston St.
Hart, Albert Lewis . . . . . Arch., Econ., Fr., Geol., Germ., Hist., Lit.	*Boston*	117 Pinckney St.
Harvey, Frederic Hall . . . . App. Mech., Civ. Eng., Geol., Lit., Math., Min., Phys.	*Galt, Cal.*	238 Huntington Ave.
Haskell, Samuel Stevens . . . Arch. (part.)	*St. Paul, Minn.* . .	Newton Centre.
Hawes, George Mason . . . . D. G., Germ., Math., Mech., Phys., Shop.	*Fall River*	356 Columbus Ave.
Hawkins, William Robert . . . D. G., Germ., Shop.	*Steubenville, Ohio* . .	137 Pembroke St.
Hawley, George Burton . . . Math., Mech. Eng., Phys.	*Hartford, Conn.* . .	Hotel Ilkley.
Heywood, Charles Davis . . . Chem., Dr., Eng., Germ., Math.	*Holyoke*	144 W. Newton St.
Highlands, John Ashley . . . App. Mech., Dr., Germ., Math., Phys., Shop.	*Fall River*	78 Huntington Ave.
Hight, Francis William . . . Arch (part.)	*Portland, Me.* . . .	457 Cambridge St., A.
Hill, Joseph Briggs, Jr. . . . . Arch., Dr., Math.	*Great Neck, N. Y.* . .	202 W. Chester Pk.
Hilliard, John Dunlap, Jr. . . App. Mech., Elect., Germ., Math., Mech. Eng.	*Provincetown* . . .	28 Dwight St.
Hirst, Philip Leslie . . . . . Chem., Dr., Mech.	*Huddersfield, England*	113 Berkeley St.

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Holliday, Clyde William . . .	*Roxbury*	17 Stafford St., R.
Acous., Germ., Lit., Math., Mech., Phys., Shop.		
Holmes, Edward Jackson . . .	*Boston*	75 Beacon St.
Phys.		
Hooper, George Kennard . . .	*Dedham*	Dedham.
App. Mech., Mech. Eng.		
Hopewell, Charles Frederick . .	*Cambridgeport* . . .	Cambridgeport.
Chem., D. G., Germ., Math., Phys., P. E., Shop.		
Hopkins, Prescott Andrews . .	*Newburyport* . . .	140 Beacon St.
App. Mech., Arch., Geol., Germ., Lit., Math., Phys.		
Houghton, Herbert Allen . . .	*Hudson*	243 W. Canton St.
D. G., Math., Phys., Shop.		
Houpt, Harry Sterling	*Wilkesbarre, Pa.* . . .	290 Columbus Ave.
Arch. (part.)		
Howland, Arthur	*West Newton* . . .	West Newton.
App. Mech., Elect., Mech. Eng., Shop.		
Howland, Frank Seaman . . .	*Athens, N. Y.* . . .	57 Chandler St.
Chem., Dr., Eng., El. Fr., Math., Mil.		
Hoyt, Charles Henry	*Lynn*	Lynn.
Chem., D. G., Germ., Math., Shop.		
Hubbard, Gorham, B. A. . . .	*Boston*	210 Beacon St.
Arch. (part.)		
Hughes, Edward Seneca . . .	*Cincinnati, Ohio* . .	3 Webster St., A.
Chem., Dr., Math., Mil.		
Hungerford, Jarvis Warren . .	*Chester, Conn.* . .	67 Chandler St.
Dr., Math., Mil., Shop.		
Hunt, Edward Marshall . . .	*Portland, Me.* . . .	12 Falcon St., E. B.
Chem., Dr., Eng., El. Fr., Math., Mil.		
Hunt, Myron Hubbard	*Terre Haute, Ind.* . .	Newtonville.
Arch. (part.)		
Hunt, William Francis	*W. Weymouth Depot* .	W. Weymouth Depot.
Chem., Dr., D. G., Surv.		
Iglesias, Eugenio Tomas . . .	*San Juan, Porto Rico* .	483 Shawmut Ave.
Chem., D. G., Germ., Math., Phys., P. E., Shop.		
Jackson, Oliver Howard . . .	*Fall River*	28 Berwick Park.
B. A., Chem., Germ., P. E., Th. Chem.		
Jacobs, Arthur Lincoln	*Melrose Highlands* . .	Melrose Highlands.
App. Mech., Arch., Elect., H. and V., Mech. Eng., Met., Phys., Shop.		
Jenks, Barton Pickering . . .	*Boston*	290 Marlboro' St.
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Johnson, Charles Herbert . . .	*Jamaica Plain* . . .	494 Centre St., J. P.
D. G., Germ., Math., P. E., Surv.		
Jones, Bayard Franklin . . .	*Kansas City, Mo.* . .	Cambridgeport.
Arch. (part.)		
Jones, John William	*Needham*	Needham.
Chem., Dr., Eng., Germ., Math.		
Jones, Milton Frank	*Natick*	Natick.
Chem., Eng., Fr.		
Kato, Godfrey Euziro	*Kyoto, Japan* . . .	87 W. Springfield St.
Acous., App. Mech., Germ., Mech., Phys.		

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Chem., D. G., Germ., Math., Mech., Phys., P. E., Shop.		
Kimball, Henry Raymond . . .	*Lowell*	Lowell.
Chem., Germ., Math., P. E., Shop.		
King, Warren Dudley	*Peabody*	Peabody.
Acous., App. Mech., Elect., Germ., Lit., Math., Mech., Phys.		
Knudsen, Augustus Francis . .	*Kauai, H. I.*	Cambridge.
App. Mech., Civ. Eng., Geol., Lit., Math., Phys.		
Kraft, Elmer Philip	*Red Bluff, Cal.* . . .	137 W. Newton St.
App. Mech., Germ., Math., Mech., Phys., Shop.		
Laighton, Florence Marian . .	*Portsmouth, N. H.* . .	63 Worcester St.
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Lambert, Wallace Corliss . . .	*Lowell*	56 Clarendon St.
Civ. Eng., Germ., Lit., Math., Phys.		
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Chem., Dr., Eng., El. Fr., Math., Mil.		
Lee, Elisha, Jr.	*Port of Spain, Trinidad*	684 Tremont St.
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Arch. (part.)		
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Arch. (part.)		
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App. Mech., Chem., Met.		
Littlefield, James Drake . . .	*So. Newmarket Junc., N. H.*	Parker Hill Ave., R.
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Lotz, Arthur Charles	*Chicago, Ill.*	201 W. Newton St.
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Elect., Fr., Lit., Math., Phys.		
Mansfield, King William . . .	*Melrose Highlands* . .	Melrose Highlands.
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Marquand, Philip, A. B. . . .	*Newburyport*	4 Spruce St.
App. Mech., Civ. Eng., Germ., Met., R. R. Man.		
McKenzie, Donald Neil . . .	*Galveston, Texas* . .	218 W. Springfield St.
Arch. (part.)		
McNear, Mary Isabella . . .	*Everett*	Everett.
Biol., Chem., Eng.		
Mead, Percy Winthrop	*Norwalk, Conn.* . .	8 St. James Ave.
D. G., Germ., H. and V., Math., Mech., Phys., Shop.		

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Meserve, Richard Earle Arch. (part.)	*Dover, N. H.*	708 Tremont St.
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Mirick, George Landon App. Mech., Ast., Civ. Eng., Geol., Germ., Lit., Math., Phys.	*Everett*	Everett.
Mitchell, Benjamin Merwin D. G., Germ., Math., Mech., Phys., Shop.	*So. Britain, Conn.*	507 Columbus Ave.
Mitchell, George Mackenzie D. G., Germ., Math., Mech., Phys., P. E., Shop.	*New Glasgow, N. S.*	27 Holyoke St.
Moody, Herbert Raymond Chem., Germ., Ind. Chem., Lit., Phys.	*Chelsea*	Chelsea.
Mott-Smith, Harold Meade Chem., Dr., Eng., Fr., Math, Mil.	*Boston*	101 Newbury St.
Moulton, Albert Sweetser Chem., D. G., El. Fr., Math., Shop.	*Lynn*	200 Dartmouth St.
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Newman, Andrew Parker, Jr. App. Mech., Civ. Eng., Geol., Germ., Lit., Math., Phys.	*Roxbury*	19 Montrose St., R.
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Palmer, Alden Robbins D. G., Fr., Math., Mech., Phys., P. E., Shop.	*Wellington, Ohio*	41 West Newton St.
Palmer, Charles Nelson Chem., Math., Mech., Min., Span. Surv.	*Middletown, Conn.*	6 Rutland Sq.
Park, Charles Francis App. Mech., Germ., Math., Mech. Eng., Phys., Shop.	*Taunton*	Taunton.
Pastorius, Charles Sharpless Arch. (part.)	*Colorado Springs, Colo.*	Newton.
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Peabody, William Welcome Ast., D. G., Math., Phys., Surv.	*Gilead, Me.*	35 Rutland Sq.
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Peck, Walter Toucey Acous., D. G., Math., Mech., Phys., P. E., Shop.	*Boston*	Hotel Argyle.

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Reed, Frederick Newland . . . Arch., Fr.	*Dorchester*	100 Savin Hill Av., D.
Resor, William Seth . . . . Acous., D. G., Germ., Math., Mech., Phys., P. E., Shop.	*Cincinnati, Ohio* . .	121 Beacon St.
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Roach, Harry Fay . . . . . Arch. (part.)	*St. Louis, Mo.* . . .	Newton Highlands.
Robeson, Anthony Maurice . . Chem., Dr., El. Fr., Math.	*Belvidere, N. J.* . . .	Cambridgeport.
Rogers, Howard Lewis . . . . Chem., D. G., Math., Phys., Shop., Span.	*Newton Centre* . . .	Newton Centre.
Root, Edward Thompson, A. B. Arch. (part.)	*Providence, R. I.* . .	Malden.
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Rosenheim, Samuel Faisst . . Arch. (part.)	*St. Louis, Mo.* . . .	135 W. Newton St.
Ruggles, Horace Fowle . . . App. Mech., Germ., H. and V., Mech. Eng., Phys.	*Boston*	165 Falmouth St.
Sawyer, Charles Winthrop . . Arch. (part.)	*Dorchester*	41 Humphreys St., D.

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Acous., Chem., D. G., Draw., Eng., Math., Shop.		
Schneider, Ferdinand Turton .	*Washington, D. C.* .	84 Chandler St.
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Schweitzer, John Francis, B.A. .	*New Orleans, La.* . .	292 Columbus Ave.
Arch. (part.)		
Sears, Charles Maxwell . . .	*Boston*	32 Chester Sq.
App. Mech., Elect., Math., Mech. Eng., Phys., Shop.		
Selfridge, Russell	*Charlestown*	Navy Yard, C.
Arch., Chem., Econ., Germ., Hist., Math., Phys.		
Shaw, Howard Van Doren, B.A.	*Chicago, Ill.*	27 St. James Ave.
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Shurtleff, Arthur Webster . .	*Lewiston, Me.* . . .	88 Appleton St.
Biol., Chem., Germ., Math., Phys., P. E., Zoöl.		
Sichel, Maurice	*New York, N. Y.* . .	24 Greenwich Park.
Chem., Dr., Eng., El. Fr., Math., Mil.		
Smith, Arthur Carlton	*Worcester*	143 W. Canton St.
Chem., Geol., Org. Chem., Text. Color.		
Smith, Frank Lindley	*Bangor, Me.*	62 Berkeley St.
Arch. (part.)		
Smith, Frank Patterson . . .	*Washington, D. C.* .	27 Columbus Ave.
Arch. (part.)		
Smith, Harrison Willard . . .	*Dorchester*	40 Mill St., D.
Dr.		
Stanwood, Herbert Winthrop .	*Brookline*	Brookline.
D. G., Germ., Math., Phys., P. E., Shop.		
Starr, Palmer Williamson, B.C.E.	*Carson, Ia.*	30 Dartmouth St.
App. Mech., Civ. Eng.		
Stearns, Frank Abbott	*Brookline*	Brookline.
Dr., Eng., Fr., Math.		
Stebbins, Elwyn Wilfred . . .	*Boston*	58 Chester Sq.
Ast., D. G., Math., Phys., P. E., Surv.		
Stevenson, John Robert . . .	*Lima, Peru*	6 Rutland Sq.
Germ., Math., Phys., Surv.		
Stilwell, Henry Colby, B. S. . .	*Dayton, Ohio.* . . .	127 Pembroke St.
App. Mech., Elect., Mech. Eng., Phys.		
Sweet, Kilburn Smith	*Kenduskeag, Me.* . .	57 Chandler St.
Ast., D. G., Germ., Math., Phys., P. E., Surv.		
Swift, Humphrey Hathaway, Jr.	*New York, N. Y.* . .	6 Louisburg Sq.
Arch. (part.)		
Sylvester, Edmund Quincy, Jr. .	*Hanover*	Hanover.
Arch. (part.)		
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Anthrop., Ast., Econ., Fr., Geol., Germ., Hist., Lit., Phys.		
Taylor, Gordon Hooker . . .	*N. Cambridge* . . .	N. Cambridge.
Clim., Civ. Eng., Geol., Shop., Zoöl.		

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Thorndike, Harry Hill, A.B. . . Arch. (part.)	*Boston*	175 Marlboro' St.
Tracy, Arthur M. . . . . Arch., Dr., Shop.	*Cambridge*	Cambridge.
True, Ross . . . . . Chem., Dr., Eng., El. Fr., Math., Mil.	*Augusta, Me.* . . .	74 Harvard Ave., A.
Turner, Alfred Copeland . . . Arch., Dr., Fr., Math.	*Cambridge*	Cambridge.
Tuttle, Reuel Crompton, A. B. . Arch. (part.)	*Windsor, Conn.* . . .	12 Exeter Chambers.
Vance, Joseph McArthur . . . Arch.	*Chattanooga, Tenn.* .	506 Columbus Ave.
Vining, Louis Bradford . . . Acous., Germ., Lit., Math., Phys.	*So. Weymouth* . . .	437 Columbus Ave.
Wadsworth, James Stevenson . D. G., Germ., Math., Mech., Phys., Shop.	*Malden*	Malden.
Wadsworth, Mary Edna . . . Chem., Phys.	*Chelsea*	Chelsea.
Wait, Edward Riggs . . . . Arch. (part.)	*Glens Falls, N. Y.* . .	19 W. Cedar St.
Waitt, Charles Greene . . . . Biol., Geol., Germ., Math., Org. Chem., Phys., Surv.	*Malden*	Malden.
Waldron, Samuel Payson . . . Ast., D. G., Germ., Math., Phys., Surv.	*Lancaster, N. H.* . .	Somerville.
Walker, Amasa . . . . . Chem., Germ., Math., P. E., Shop.	*No. Brookfield* . . .	16 Durham St.
Walker, Ambrose . . . . . Arch., Geol., Hist., H. and V., Lit.	*Boston*	237 Beacon St.
Wallace, Frederic Appleton . . Germ., Math., Mech., Phys., Shop.	*Lynnfield*	Lynnfield.
Wardner, Herbert Leavitt . . . Arch. (part.)	*Dorchester*	Bowdoin Ave., D.
Warren, Frederic Ives . . . . D. G., Germ., Math., Phys., P. E., Shop.	*Bay City, Mich.* . . .	415 Columbus Ave.
Washburn, Cadwallader Lincoln Arch. (part.)	*Minneapolis, Minn.* .	11 Yarmouth St.
Waterman, Charles Clarence . . Elect., Math., Shop.	*Charlestown*	80 Green St., C.
Waterman, Harry Cushing . . Arch., Chem., Germ., Phys.	*Hanover*	Hanover.
Welch, James Jefferson . . . App. Mech., Arch., Civ. Eng., Geol., Lit., Math., Phys.	*Salem*	Salem.
Welch, Thaddeus Stevens . . App. Mech., Math., Phys., Shop.	*Augusta, Me.*	5 Myrtle Pl., R.
Wells, Channing McGregory . . Biol., Chem., Fr., Germ., Pol. Sci., Zoöl.	*Southbridge*	78 Huntington Ave.
Westcott, Charles Henry . . . Dr., Shop.	*Kennebunkport, Me.* .	45 Upton St.

NAME.	HOME.	RESIDENCE.
Westcott, Harry Mackmann . . Arch. (part.)	*Richmond, Ind.* . . .	125 Pinckney St.
Wheeler, Arthur Lincoln, A. B. App. Mech., Elect., Fr., Math., Mech. Eng., Phys.	*Concord*	58 Chester Sq.
Wheeler, Milton Merrick . . . Chem., Dr., Eng., El. Fr., Math., Mil.	*Winona, Minn.* . . .	305 Chestnut Av. J.P.
Whiston, William Cortelyou . . Acous., Chem., D. G., Germ., Math., Mech., P. E., Phys., Shop.	*Newtonville*	Newtonville.
White, Hartley Laurington . . App. Mech., Ast., Civ. Eng., D. G., Geol., Math., Phys.	*Brookville*	Brookville.
White, James Francis . . . . Elect., Math., Phys.	*Waterbury, Conn.* . .	Hotel Ilkley.
White, John Stafford . . . . Arch. (part.)	*Grand Rapids, Mich.* .	125 Pinckney St.
White, Joseph Foster . . . . Ind. Chem., Met., Org. Chem., Text. Color.	*Brookline*	Brookline.
Whiting, Walter Sherman . . . D. G., Germ., Math., Surv.	*Cambridge*	Cambridge.
Whitman, Edward Payson . . . Arch. (part.)	*Cambridge*	Cambridge.
Whittemore, Amy Florence . . Chem.	*Concord, N. H.* . . .	105 Charles St.
Wiggin, George Otis . . . . Dr., El. Fr., Math.	*Santa Fé, Arg. Rep.* .	78 Waltham St.
Willey, Nettie Morton . . . . Biol., Chem., Org. Chem., Phys.	*Roxbury*	1 Bower Park, R.
Wilson, Winslow Abbott . . . Dr., Eng., Math., Mil.	*Dorchester*	72 Magnolia St., D.
Wingate, Edward Lawrence . . D.G., Math., Mech., Phys., P. E., Shop.	*Malden*	Malden.
Woltersdorf, Arthur Fred . . . Arch. (part.)	*Chicago, Ill.*	114 Chandler St.
Wooffindale, Warren Herbert . Chem., Germ., Ind. Chem., Phys.	*Charlestown*	257 Bunker H. St., C.

SUMMARY.

GRADUATE STUDENTS	48	REGULAR STUDENTS, 2d year .	154
REGULAR STUDENTS, 4th year .	114	" " 1st " . .	250
" " 3d " . .	138	SPECIAL STUDENTS	280

Total	984
Deduct names counted twice	47
	937

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.

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2. Their applications must be made in writing, addressed to the Secretary of the Faculty, specifying the course or courses they desire to attend, mentioning their present or prospective occupations, and, when the course is of a nature de-

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The number of students in each class is necessarily limited.

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I. LIVRES ET AUTEURS. Twelve lectures in French by Associate Professor Jules Luquiens, on Tuesdays and Fridays, at 7.30 P. M., beginning November 11th.

II. THE STRENGTH OF MATERIALS AS SHOWN BY EXPERIMENTS. Twelve lectures by Professor G. Lanza, on Tuesdays and Fridays, at 7.30 P. M., beginning November 11th.

III. THEORY OF SOUND. Twelve lectures by Professor Charles R. Cross, Mondays and Wednesdays, at 7.30 P. M., beginning November 17th.

IV. DIFFERENTIAL AND INTEGRAL CALCULUS. Fifteen lectures by Associate Professor Webster Wells, Tuesdays and Thursdays, at 7.30 P.M., beginning November 11th.

V. DESCRIPTIVE GEOMETRY INCLUDING SHADOWS. Twelve lectures by Assistant Professor Linus Faunce, on Mondays and Wednesdays, at 7.30 P. M., beginning February 2d.

VI. NEW YORK STATESMEN, OR LEADERS OF PUBLIC OPINION IN THE STATE OF NEW YORK, FROM CLINTON TO CONKLING. Twelve lectures by Associate Professor C. H. Levermore, on Mondays and Fridays, at 7.30 P. M., beginning January 5th.

VII. CRYSTALLOGRAPHY. Twelve lectures by Assistant Professor W. O. Crosby, on Tuesdays and Fridays, at 7.30 P. M., beginning February 3d.

VIII. TAXATION. Twelve lectures by Associate Professor Davis R. Dewey, on Tuesdays and Fridays, at 7.30 P. M., beginning November 11th.

IX. GOETHE'S "FAUST," 2d Part. Twelve lectures by Professor A. N. van Daell, December 3, 10; January 7, 14, 21; February 11, 18, 25; March 4, 11, 18, 25; at 7.30 P. M.

X. PUBLIC HYGIENE. Twelve lectures by Associate Professor W. T. Sedgwick, on Tuesdays and Fridays, at 7.30 P M., beginning February 3d.

XI. USE OF POCKET INSTRUMENTS IN TOPOGRAPHICAL SURVEYING. Twelve lectures by Associate Professor A. E. Burton, on Mondays and Thursdays, at 7.30 P. M., beginning February 2d.

XII. ELEMENTS OF THE THEORY OF DETERMINANTS. Twelve lectures by Assistant Professor H. W. Tyler, on Mondays and Thursdays, at 7.30 P. M., beginning February 2d.

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 Mrs. Minnie E. Gray.

Requirements for Admission. — To teach drawing is not among the objects of this school. Applicants must therefore possess a knowledge of drawing adequate to enable them advantageously to begin the work of composition and design. A considerable degree of skill in free-hand drawing from Nature, and in the use of the brush, will be positively required for entrance to the school.

Applicants for admission, or persons desiring further information regarding this school, may apply by letter to the Secretary of the Institute.

Regulations of the School. — The next school-year will begin on Sept. 28, 1891. The number of students in the school, including those to be admitted, will be limited to sixty. Examinations for applicants for admission will be held on Sept. 22, 1891. Students are required to be regular in their attendance, the hours being from 9.30 A. M. to 12 M., and from 2 P. M. to 4.30 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 qualifications for an 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.	RESIDENCE.
Allen, Constance Eugenia	*Wellesley Hills*	Wellesley Hills.
Allen, Maud Augusta	*Roxbury*	4 Grosvenor Pl., R.
Battaglia, Josephine Veronica	*Roxbury*	22 Centre St., R.
Battaglia, Orlando Frank	*Roxbury*	22 Centre St., R.
Besse, Ada Viola	*Lynn*	Lynn.
Bird, Mabel Rebecca	*Dorchester*	122 Cottage St., D.
Brown, Louis Henry	*Leominster*	Leominster.
Buss, Charles Holmes, Jr.	*Woburn*	Woburn.
Coburn, Lillian Susan	*Tyngsborough*	No. Woburn.
Cole, Isabelle Newell	*Newton*	Newton.
Covell, George Ellis	*Fitchburg*	Fitchburg.
Crowley, Elizabeth Cecilia	*Friend, Neb.*	Winchester.
Dansereau, William Winfield	*Marlboro'*	Marlboro'.
Dodge, Luvein Elma	*Charles River Village*	Charles Riv. Village.
Downey, Frank J.	*Boston*	74 Westminster St.
Dwinnell, Nellie Elizabeth	*Springfield*	30 Worcester Sq.
Edwards, William Joseph	*Boston*	767 Tremont St.
Ferry, Grace Elizabeth	*Milton*	Milton.
Forbes, Alice Belle	*Roxbury*	54 School St., R.
Ford, Myron Porter	*East Weymouth*	East Weymouth.
Fraser, Edna Anne	*Jamaica Plain*	86 Wyman St., J. P.
Frost, Mary Edith	*Somerville*	Somerville.
Gilson, Howard Augustus	*Somerville*	Somerville.
Grant, William Tisdale	*Taunton*	Taunton.
Harlow, Mabel	*Bangor, Me.*	Medford.
Hill, Maria Louisa	*Salem*	W. Somerville.
Jenkins, Helen Candace	*Ning-po, China*	46 Chester Pk.
Jewett, Lucia Virginia	*Bradford*	Bradford.
Ladd, Elizabeth Appleton	*Needham*	Needham.
Lillie, Albert Webster	*Chelsea*	Chelsea.
Lincoln, Benjamin Morton	*Taunton*	Taunton.
Luce, Fred Alanson	*Haverhill*	Haverhill.
Luce, William Darius	*Haverhill*	Haverhill.
Lyman, Mary Wheelock	*Bolton*	795 Washington St.
McDuffie, Charles Cummings	*Haverhill*	Haverhill.
Means, Harry Fuller	*So. Boston*	104½ Dorch'r St.,S.B.
Meredith, Carolina Amelie	*Boston*	658 Tremont St.
Miller, Mary Dill	*Dummerston, Vt.*	56 Clarendon St.

NAME.	HOME.	RESIDENCE.
Milliken, Emma Caroline	*Chelsea*	Chelsea.
Mitchell, George Bertrand	*East Bridgewater*	East Bridgewater.
Nichols, Edward Stanley	*Charlestown*	20 Monument Ct., C.
Olson, Annie Smith	*Hingham*	Hingham.
Park, Harry Segers	*Stockton Springs, Me.*	Waltham.
Parker, George Pillsbury	*Jamaica Plain*	16 Wyman St., J. P.
Pierson, Gertrude Elise	*Boston*	75 Chester Sq.
Poor, Susan Osborn	*Salem*	Salem.
Reich, Arthur Louis	*Zanesville, Ohio*	54 Chandler St.
Rogers, Kate Lincoln	*Kauai, H. I.*	4 Brookline Ave., R.
Sargent, Frederick Amasa	*Wyoming*	Wyoming.
Shaw, Ella Louise	*Portland, Me.*	36 Holyoke St.
Stetson, Ada Frances	*Charlestown*	55 High St., C.
Swan, Walter Buckingham	*Boston*	79 Worcester St.
Taplin, William Henry	*E. Somerville*	E. Somerville.
White, Standish Gunn	*Roxbury*	34 Highland St., R.
Wiksell, Julia Therese	*Dorchester*	98 Savin Hill Av., D.
Wilber, Herbert T.	*So. Boston*	426W.FourthSt.,S.B.
Williams, Herbert De Land	*Newton Centre*	Newton Centre.
Woods, Reuben Edward	*So. Boston*	876 Fourth St., S. B.

Alumni Association.

THE Alumni Association of the Institute holds its annual meetings 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: CHARLES T. MAIN, '76.

Secretary: C. FRANK ALLEN, '72.

Executive Committee: THE PRESIDENT, VICE-PRESIDENT, AND SECRETARY, WALTER B. SNOW, '82, HOLLON C. SPAULDING, '87.

THE NORTHWESTERN ASSOCIATION, MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

President: THEODORE W. ROBINSON, '84, 341 Superior St., Bay View Station, Milwaukee, Wis.

Vice-Presidents: H. B. STONE, '78, ARTHUR WINSLOW, '81.

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

Register of Graduates.

For names marked with a † the addresses are not known to be correct for the present year. 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 page 22.

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 at the 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 . . . . Third St., E. Cambridge, Mass.	II.	Mechanical Engineer with George F. Blake Mfg. Co.
WILLIAM E. HOYT . . . . Rochester, N. Y.	I.	Chief Engineer, Buffalo, Rochester & Pittsburgh R. R. Co.
ROBERT H. RICHARDS . . . Boston, Mass.	III.	Professor of Mining Engineering and Metallurgy, Mass. Institute of Technology.
WALTER H. SEARS . . . . 150 Ellison St., Paterson, N. J.	I.	Chief Assistant Engineer, East Jersey Water Company.
*CHARLES A. SMITH . . .	I.	Died Feb. 4, 1884.
JOSEPH STONE . . . . . 85 Milk St., Boston, Mass.	I.	In business.
†BRYANT P. TILDEN . . . Jamestown, S. Dak.	III.	Chief Engineer, N. P. R. R.
JAMES P. TOLMAN . . . . 164 High St., Boston, Mass.	III.	President, Samson Cordage Works.

1869.

WILLIAM H. BAKER . . . Fitchburg, Mass.	I.	Civil Engineer.
HOWARD A. CARSON . . . 93 Lincoln St., Boston, Mass.	I.	Chief Engineer of the Metropolitan Sewerage Commission of Massachusetts.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
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 . . . St. Paul, Minn.	I.	Principal Assistant Engineer, Northern Pacific R. R.
N. FREDERICK MERRILL . . Burlington, Vt.	V.	Professor of Chemistry, University of Vermont.
THEODORE F. TILLINGHAST . 474 County St., New Bedford, Mass.	I.	Lumber Dealer.
EDMUND K. TURNER . . . Fitchburg, Mass.	I.	Chief Engineer, Fitchburg R. R.
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 . . . Lunenburg, Mass.	I.	Farming.
*ADDISON CONNOR, A.B. . . New York, N. Y.	I.	Died January 4, 1891.
*HENRY M. CUTLER . . .	I.	Died May 16, 1877.
*ELMER FAUNCE.	III.	Died July 6, 1882.
EDWARD H. FOOTE. . . . 31 Commercial St., Boston, Mass.	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 and Lecturer on Metallurgy, Mass. Institute of Technology.
ALBERT H. HOWLAND, A. M. 60 Congress St., Boston, Mass.	I.	Civil Engineer.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
G. RUSSELL LINCOLN . . . Hingham, Mass.	III.	Graduate Student, Mass. Institute of Technology.
WILLIAM A. PIKE . . . . 2525 University Ave. S. E., Minneapolis, Minn.	I.	Dean of the College of Mechanic Arts and Professor of Engineering, University of Minnesota.
GEORGE H. PRATT . . . . 114 Moreland St., Roxbury, Mass.	V.	
EDWARD W. ROLLINS . . . 1655 Curtis St., Denver, Colo.	III.	President, Rollins Investment 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 TROWBRIDGE, JR.	II.	Died Dec. 5, 1878.
ISAIAH S. P. WEEKS . . . Lincoln, Neb.	I.	Chief Engineer, Burlington & Missouri River R. R. in Nebraska.
RANDAL WHITTIER . . . . 444 W. Jefferson St., Louisville, Ky.	V.	Cashier, Kentucky Branch Office, N. Y. Life Insurance Co.

1872.

C. FRANK ALLEN . . . . Boston, Mass.	I.	Associate Professor of Railroad Engineering, Mass. Institute of Technology.
BENJAMIN E. BREWSTER . . Cheyenne, Wyoming.	III.	Manager, War Bonnet Live Stock Co.
WILLIAM B. DODGE . . . Columbus, Ohio.	I.	Scale Inspector, P. C. & St. L. R. R.
FREDERIC A. EMMERTON . . 214 Richard St., Joliet, Ill.	V.	Supt. Blast Furnaces, Joliet Works, Illinois Steel Co.
JAMES A. HERRICK . . . . 15 Whitehall St, New York, N.Y.	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.	Assistant Professor of Histology and Embryology, Harvard Medical School.
MAURICE B. PATCH . . . Lake Linden, Mich.	III.	Superintendent, Calumet & Hecla Smelting Co.
WALTER SHEPARD, A. B. . Arion St., Dorchester, Mass.	I.	Assistant Engineer, Boston & Albany R. R.
RICHARD H. SOULE, A. B. Swissvale, Pa.	II.	General Agent and Assistant General Manager, Union Switch & Signal Co.
CLARENCE S. WARD . . . 83 Devonshire St., Boston, Mass.	III.	Lawyer, and Treasurer of the Standard Gas Fuel Co.

1873.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
AMORY AUSTIN, A. B. . . 23 Catherine St., Newport, R. I.	V.	
GEORGE W. BLODGETT . . Central St., Auburndale, Mass.	I.	Electrical Engineer, B. & A. R. R., and 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, JR. . 80 Broadway, New York, N. Y.	I.	President of E. T. V. & G. Ry. Co., and of C., N. O. & T. P. Ry. Co.
FREDERICK L. FISHER . . Medway, Mass.	I.	Insurance Agent and Broker, Medway, and 35 Kilby Street, Boston.
FRED. GUILD, JR., . Boston, Mass.	Sci. and Lit.	With Whittier Machine Co., 1176 Tremont Street.
W. DALE HARRIS . . . . 237 MacLaren St., Ottawa, Can.	I.	Chief Engineer, P. P. J. Railway; Chief Engineer, O. & G. V. Railway.
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 . . 77 State St., Boston, Mass.	III.	Mining Engineer.
†GEORGE PHILLIPPS . . . Marshfield, Mass.	III.	Mining Engineer.
HENRY A. PHILLIPS . . . 30 Kilby St., Boston, Mass.	IV.	Building Superintendent.
ELLEN H. RICHARDS, A. M. Boston, Mass.	V.	Instructor in Sanitary Chemistry, Mass. Institute of Technology.
HENRY L. RIPLEY . . . . Care Horatio Adams, Box 2526, Boston, Mass.	I.	First Lieutenant, Third Cavalry, U. S. A., Fort Brown, Tex.
ROBERT A. SHAILER . . . 609 Phenix Bldg., 138 Jackson St., Chicago, Ill.	I.	Of the Firm of Shailer & Schniglau, Engineers and Contractors.
C. EDWARD STAFFORD . . Care Shoenberger & Co., Pittsburgh, Pa.	III.	Supt., Bessemer and Open Hearth Departments, Juniata Iron and Steel Works.
SAMUEL E. TINKHAM . . 58 Thornton St., Roxbury, Mass.	I.	Civil Engineer, City Engineer's Office, Boston.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
FRANK W. VERY . . . . Allegheny, Pa.	V.	Assistant Astronomer, Allegheny Observatory.
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. 24 Marlboro' St., Boston, Mass.	V.	Assistant Professor of Therapeutics, Harvard Medical School; Physician to Out-Patients at the Boston City Hospital.
LOUIS F. WOOD . . . . 440 Atlantic Ave., Boston, Mass.	V.	Chemical, Color, and Varnish Manufacturer.

1874.

HERBERT BARROWS . . . Reading, Mass.	I.	Real Estate First Mortgage Loans.
GEORGE H. BARRUS . . . 95 Milk St., Boston, Mass.	II.	Expert and Consulting Steam Engineer.
WILLIAM T. BLUNT . . . Chicago, Ill.	I.	Principal Assistant Engineer in charge Surveys, Sanitary District of Chicago.
†GEORGE E. DOANE . . . Middleboro', Mass.	I.	Of the Firm of J. & G. E. Doane, Hardware.
WILLIAM B. DOWSE . . . Wallingford, Conn.	IV.	Of the Metropolitan Rubber Co.
JOSEPH S. EMERSON . . . Honolulu, Hawaiian Isl'ds.	I.	Field Assistant, Government Survey.
ELIOT HOLBROOK . . . . Pittsburgh, Pa.	I.	Superintendent, B. & O. 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.
FRANK H. JACKSON . . . 145 South Broadway, Los Angeles, Cal.	III.	Mining and Hydraulic Engineer, of Firm J. P. Culver & Co.
*WILLIS H. MYRICK . . .	II.	Died Oct. 17, 1875.
†HERBERT B. PERKINS . . Oroville, Cal.	I.	Teacher of Mathematics.
FRANK H. POND . . . . 707 Market St., St. Louis, Mo.	II.	President, Pond Engineering Co.
EDWARD S. SHAW . . . . 146 Franklin St., Boston, Mass.	I.	Consulting Engineer.
FRANCIS H. SILSBEE . . . Lawrence, Mass.	II.	Superintendent, Cotton Dept., Pacific Mills.
*ARTHUR W. SWEETSER .	I.	Died April 10, 1878.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
*Robert C. Ware,	Sci. and Lit.	Died June 25, 1883.
Stephen H. Wilder, 64 W. Third St., Cincinnati, Ohio.	Sci. and Lit.	Attorney-at-Law.

1875.

Samuel E. Allen . . . 67 Chauncy St., Boston, Mass.	I.	Agent for the Nashawannuck Manufacturing Co.
†James L. Arnott, Thompsonville, Conn.	Sci. and Lit.	Division Engineer in charge of Construction, Burlington & Missouri River R. R., Lincoln, Neb.
Amos J. Boyden . . . . 413 Walnut St., Phila., Pa.	IV.	Architect.
Moses D. Burnet . . . 708 James St., Syracuse, N. Y.	III.	Burnet & Westcott, Bankers and Brokers.
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.
Edgar S. Dorr . . . . 14 Beacon St., Boston, Mass.	I.	Assist. Engineer, Sewer Department.
William C. Edes . . . . Fourth and Townsend Streets, 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, Mass.	I.	Civil and Hydraulic Engineer.
Edward A. Handy . . . 210 Kennard St., Cleveland, Ohio.	I.	Engineer, Lake Shore Division L. S. & M. S. Railway.
*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 at Worcester Polytechnic Institute.
Wilfred Lewis . . . . 3234 Powelton Ave., Philadelphia, Pa.	II.	Assist. Engineer, with William Sellers & Co. (incorporated).
Samuel J. Mixter, M. D. 180 Marlboro' St., Boston, Mass.	VIII.	Demonstrator of Anatomy, Harvard Medical School.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
BENJAMIN A. OXNARD . . 24 N. Peters St., New Orleans, La.	III.	Secretary and Treasurer Louisiana Sugar Refining Co.
THOMAS D. PLIMPTON . . Walpole, Mass.	II.	General Store.
WILLIAM A. PRENTISS, Sci. and Holyoke, Mass.	Lit.	Of the Firm of Geo. W. Prentiss & Co., Manufacturers of Wire.
FRANCIS T. SARGENT . . . 47 and 49 Liberty St., New York, N. Y.	II.	Broker and Contractor.
WELLAND F. SARGENT . . 5316 Jefferson Ave., Hyde Park, Ill.	I.	Civil Engineer and Surveyor, Chicago, Ill.
WILLIAM H. SHOCKLEY . . Candalaria, Esmeralda Co., Nev.	III.	Superintendent and General Manager, Mount Diablo Mill and Mining Co.
JAMES B. STANWOOD . . . Cincinnati, Ohio.	II.	Director of Cincinnati Technical School and Mechanical Engineer.
†H. L. J. WARREN	III.	Mining Engineer and Stock-raiser.
WILLIAM R. WEBSTER . . 413 Walnut St., Phila., Pa.	III.	Civil Engineer and Bridge Inspector.
		1876.
CHARLES F. ALLEN . . . Care H. N. Allen, Osterville, Mass.	III.	Mining Engineer and Metallurgist.
THOMAS ASPINWALL . . . 12 Pearl St., Boston, Mass.	I.	Civil Engineer.
WILLIAM P. ATWOOD . . Belmont Ave., cor. Mansur St., Lowell, Mass.	V.	Chemist at the Hamilton Print Works.
THOMAS W. BALDWIN, A. B. Room 1, Exchange Block, Bangor, Me.	I.	Civil Engineer.
WALTER B. BARROWS . . Washington, D. C.	VII.	First Assist. Ornithologist, U. S. Dept. of Agriculture.
AARON D. BLODGETT . . . 383 Federal St., Boston, Mass.	II.	Manufacturing Electrician.
JOSHUA B. F. BREED . . . 209 W. St. Catherine St., Louisville, Ky.	I.	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, Ill.	I.	Treasurer, Diamond Prospecting Co.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
WILLIAM O. CROSBY . . . Boston, Mass.	VII.	Assistant Professor of Mineralogy and Lithology, Mass. Institute of Technology.
WILLIS E. DAVIS . Sci. and Lit. 211 Drum St., San Francisco, Cal.		Davis & Cowell, Manufacturers of Santa Cruz Lime.
*CLARENCE L. DENNETT .	II.	Died June 5, 1878.
CHARLES R. FLETCHER . . 82 Equitable Building, Boston, Mass.	V.	Consulting Chemist and Metallurgist.
JOHN R. FREEMAN. . . . 31 Milk St., Boston, Mass.	I.	Engineer and Assistant Chief of Inspection Dept., Assoc. Factory Mutual Ins. Co.
FRANCIS E. GALLOUPE . . 30 Kilby St., Boston, Mass.	II.	Mechanical Engineer.
*ROBERT H. GOULD Metallurgy.		Died Nov. 19, 1878.
JOHN B. HENCK, JR. . . 15 Blagden St., Boston, Mass.	VIII.	Secretary, Massachusetts Institute of Technology.
FRANK W. HODGDON . . Arlington, Mass.	I.	Asst. Engineer with the Harbor and Land Commissioners of Mass., Boston.
SUMNER HOLLINGSWORTH . Boston, Mass.	II.	President, Hollingsworth & Whitney Paper Co.
SILAS W. HOLMAN . . Boston, Mass.	VIII.	Associate Professor of Physics, Mass. Institute of Technology.
ALFRED E. HUNT . . . . 95 Fifth Ave., Pittsburgh, Pa.	III.	Of the Firm of Hunt & Clapp, Chemists and Metallurgical Engineers, Pittsburgh Testing Laboratory; Prest. of Pittsburgh Reduction Co.
WILLIAM W. JACQUES . 95 Milk St., Boston, Mass.	VIII.	Electrician of the Am. Bell Telephone Co., Instructor, Mass. Institute of Technology.
SAMUEL JAMES, JR. . . . Denver, Colo.	III.	Ore Buyer for Globe Smelting & Refining Co.
ALFRED C. KILHAM . . . North Springfield, Mo.	II.	Employed in Motive Power Dept., St. Louis & San Francisco R. R.
†J. AUSTIN KNAPP. . . . Brockton, Mass.	II.	Contractor and Manufacturer of Custom-Made Goodyear Welt Shoes.
THEODORE J. LEWIS . . . 212 North Thirty-fourth St., Philadelphia, Pa.	II.	With the Standard Steel Works, 220 South Fourth St.
ALBERT H. LOW . . . . P. O. Box 2395, Denver, Colo.	V.	Chemist.
CHARLES T. MAIN . . . . Lawrence, Mass.	II.	Superintendent, Lower Pacific Mills.
ARTHUR L. MILLS . . . . 2272 Ashland Ave., Toledo, Ohio.	I.	Chief Engineer, T. St. L. & K. C. R. R.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
WILLIAM E. NICKERSON . 111 North Ave., Cambridge, Mass.	V.	Chemist.
DAVID W. PHIPPS . . . . Box 426, 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, Sci. and Lit. Room 5, 125 Dearborn St., Chicago, Ill.		Real Estate.
THEODORE E. SCHWARZ . . 1537 Arapahoe St., Denver, Colo.	III.	Mining Engineer.
JULIUS H. SUSMANN . . . Newton Highlands, Mass.	III.	Out of business.
WALTER D. TOWNSEND . . Chemulpo, Korea.	III.	Of the Firm of Morse, Townsend & Co., Merchants.
CHARLES N. WAITE . . . Newton Upper Falls, Mass.	V.	Superintendent, Nelson Chemical Co.
HENRY M. WAITT . . . . Chicago, Ill.	I.	Bridge Engineer, with C. B. & Q. R. R.
*ROBERT C. WARE . . .	Phil.	Died June 25, 1883.
HENRY B. WOOD . . . . 14 Beacon St., Boston, Mass.	I.	Assistant Engineer, Sewer Department.

1877.

JOHN ALDEN . . . . . Lawrence, Mass.	V.	Chemist at the Pacific Mills.
CHARLES S. BACHELDER. . Watsonville, Cal.	V.	Chemist, Western Beet Sugar Co.
GEORGE BARTOL. . . . . Cleveland, Ohio.	III.	In charge of Mill and Forge Dept., Otis Iron & Steel Works.
†J. WILLIAMS BEAL . . . Mason Building, Boston, Mass.	IV.	Architect.
WILLIAM H. BEECHING . . 61 Blackstone St., Boston, Mass.	II.	Cork Manufacturer.
G. WALTER CAPEN . . . 45 Kilby St., Boston, Mass.	IV.	Architect.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
HENRY H. CARTER . . . 2 a Beacon St., Boston, Mass.	I.	Engineer in Charge, Improved Sewerage Construction.
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 . . . . 304 N. Eighth St., St. Louis, Mo.	IV.	Architect of Firm of Peabody, Stearns & Furber.
MARTIN GAY . . . . . W. New Brighton, Staten Island, N. Y.	I.	Assistant Engineer, Department of Public Works of New York City.
JOSEPH P. GRAY . . . . 125 Grand St., Lowell, Mass.	I.	Assistant Engineer in office of Proprietors of Locks and Canals on Merrimack River.
EDMUND GROVER . . . . Iron Gate, Va.	I.	With Iron Gate Land and Improvement Co.
RICHARD A. HALE. . . . Lawrence, Mass.	I.	Principal Assistant Engineer with the Essex Water Power Co.
†JOHN E. HARDMAN . . . 158 Stackpole St., Lowell, Mass.	III.	Mining Engineer; Manager, Oldham Gold Co., Oldham, N. S.
HENRY D. HIBBARD . . . Neville St., Pittsburgh, Pa.	III.	Consulting Engineer.
WALTER JENNEY . . . . 55 G St., So. Boston, Mass.	III.	Superintendent, Petroleum Refinery, Jenney Manufacturing Co.
*JOSEPH KIRK	II.	Died July, 1886.
GEORGE W. KITTREDGE . . Cleveland, Ohio.	I.	Assistant Chief Engineer, C., C., C., & St. L. R. R. Co.
CHARLES F. LAWTON . . . Niagara Falls, New York.	I.	Civil Engineer with the Cataract Construction Company.
BENJAMIN C. MUDGE . . . Room 30, Equitable Building, Boston, Mass.	I.	Contractor and Investment Broker.
CECIL H. PEABODY . . . Boston, Mass.	II.	Associate Professor of Steam Engineering, Mass. Institute of Technology.
ARTHUR L. PLIMPTON . . 81 Milk St., Boston, Mass.	I.	Principal Assistant Engineer, West End Street Railway.
HARRY C. SOUTHWORTH . Stoughton, Mass.	III.	
*CHARLES E. STEWART . .	I.	Died Oct. 7, 1877.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
THOMAS F. STIMPSON . . Providence, R. I.	III.	Overseer, Printing Dept., 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 . . Steelton, Dauphin Co., Pa.	III.	General Manager, Pennsylvania Steel Company.

1878.

WILLIAM B. ALLBRIGHT . Union Stock Yards, Chicago, Ill.	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, Mass.	IV.	In business.
ALFRED S. HIGGINS . . . 35 Howard St., Boston, Mass.	IV.	With R. R. Higgins & Co.
JULIAN A. KEBLER . . . 1657 Larimer St., Denver, Colo.	I.	General Manager, Colorado Fuel Co.
*FRANK H. MORGAN . . .	V.	Died Dec. 5, 1889.
†EVERELL J. NICHOLS . . Burlington, Iowa.	I.	
†FREDERICK H. PRENTISS . 2 Cortlandt St., New York, N. Y.	II.	Manager and Engineer, New York Steam Co.
JAMES RITCHIE . . . . . 95 Fifth Ave., Pittsburgh, Pa.	I.	Civil Engineer, Pittsburgh Testing Laboratory.
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 and Surgeon to Massachusetts State Prison.
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.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
ISAAC M. STORY . . . . . Somerville, Mass.	I.	Assistant Engineer, N. Y. & N. E. R. R.
*EDMUND TANEY	I.	Died May 1, 1890.
LINWOOD O. TOWNE . . . Newtonville, Mass.	III.	With Highland Foundry Co., Boston Highlands.
EMILE F. WILLIAMS . . . 81 Franklin St., Boston, Mass.	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.	With Norwich Dyeing and Bleaching Co.

1879.

WALTER S. ALLEN . . . . 13 Beacon St., Boston, Mass.	V.	Secretary, State Gas Commission.
SAMUEL T. BRALEY . . . . 14 Park St., Rutland, Vt.	II.	Mechanical Engineer.
JOHN W. CABOT . . . . . Bellaire, Ohio.	III.	Superintendent, Steel Works Department, Bellaire Nail Works.
HARRY H. CAMPBELL . . . Steelton, Dauphin Co., Pa.	III.	Asst. Superintendent, Pennsylvania Steel Co.
FRED. S. COFFIN . . . . . 152 Congress St., Boston, Mass.	III.	Manager, Wool Department, Stod Lovering & Co.
W. OTIS DUNBAR . . . . Altoona, Pa.	II.	In charge of Pennsylvania R. R. Test Room.
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.	Mining Engineer with the Colorado Fuel Co.
HORACE J. HOWE . . . . Elmira, N. Y.	I.	Assistant to Roadmaster, N. Y. L. E. & W. 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.	
WILLIAM W. MACFARLANE . 613 Fourteenth St., Chester, Pa.	V.	Superintendent Extract Dept., John M. Sharpless & Co., Manufacturer of Dye Stuffs.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
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 . Arequipa, Peru.	VIII.	In charge of Boyden Department, Harvard College Observatory.
†GEORGE F. RIGGS . . . . 19 Jay St., Cambridgeport, Mass.	I.	With U. S. Coast Survey.
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.	Assistant-General Master Car Builder, L. S. & M. S. Ry.

1880.

GEORGE H. BARTON . . . Boston, Mass.	III.	Instructor in Determinative Mineralogy Mass. Institute of Technology.
CHARLES H. BROWN . . . Wellington, Conn.	I.	
EDWIN E. CHASE . . . . Central City, Colo.	I.	United States Deputy Surveyor and Mining Engineer.
FREDERICK W. CLARK . . 243 State St., Chicago, Ill.	III.	Vice-Pres. and Engineer, Jonathan Clark & Sons, General Contractors.
GEORGE W. HAMILTON . . 14 Beacon St., Boston, Mass.	I.	With the Sewer Department.
LORING R. MILLEN . . . . 16 Beaver, St., New York, N. Y.	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 . . . . . Windsor Hotel, Montreal, P. Q.	I.	With Dominion Bridge Co.
JOHN H. ALLEN . . . . El Paso, Tex.	III.	Metallurgist, El Paso Smelting Works.
*JAMES S. ATKINSON . . .	II.	Died Dec. 17, 1883.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
AMOS BINNEY, A. B. . . . Walpole, Mass.	V.	Real Estate Agent, 31 Milk St., Boston.
DAVID S. BISSELL . . . . Pittsburgh, Pa.	III.	President, Duquesne Forge Co., Iron and Steel Forgings.
FRANK H. BRIGGS . . . . 57 High St., Boston, Mass.	IX.	Broker in Merchandise, W. L. Montgomery & Co.
†FRANK E. CAME . . . . Windsor Hotel, Montreal, P.Q.	I.	Assistant Engineer and Agent, Dominion Bridge Company.
†FRANK D. CHASE . . . Parral, Mexico.	III.	Chemist and Assayer.
BENJAMIN G. COLLINS . . Edgartown, Mass.	II.	
HARRY H. CUTLER . . . Waltham, Mass.	II.	Manufacturing Electrician.
F. GRAEF DARLINGTON . . 676 Delaware St., Indianapolis, Ind.	IX.	Superintendent, Eastern Div. C. St. L. & P. R. R., Pennsylvania Line.
JOHN DUFF, M. D. . . . . 14 Sheafe St., Charlestown, Mass.	V.	Physician.
†DAVID S. GODDARD . . . Lowell, Mass.	III.	With Coburn Shuttle 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., Limited.
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, Indigo and Ammonia Dept., Cochrane Chemical Co.
GEORGE A. MOWER . . 75 Queen Victoria St., London, Eng.	II.	General Manager, Sturtevant Blower Company, London, England.
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 . . . 417 No. Market St., Ottumwa, Iowa.	I.	Assistant Engineer, C. B. & Q. R. R.
†NATHANIEL W. SHED . . Pittsburgh, Pa.	V.	
WILLIAM R. SNEAD . . . 318 W. Chestnut St., Louisville, Ky.	IV.	General Manager, The Snead Co. Iron Works.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
HAROLD E. STEARNS . . . Montreal, P. Q.	II.	Treasurer, Dominion Wadding Co.
EDWARD R. WARREN . . Crested Butte, Colo.	VII.	United States Deputy Mineral Surveyor.
CHARLES M. WILKES. . . 203 First Nat'l Bank Building, Chicago, Ill.	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 . . . 621 E. Fifteenth St., Davenport, Iowa.	II.	Secretary of the Bettendorf Metal Wheel Co.
EDWARD F. ELY, A. B. . . New York, N. Y.	IV.	Architect.
GEORGE FAUNCE, A. B. . . Mansfield Valley, Allegheny Co., Pa.	III.	Assistant Superintendent of Pennsylvania Lead Co.'s Works.
*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. Boston, Mass.	VII.	Instructor in Biology, Mass. Institute of Technology.
FRANCIS P. HALL . . . . Emporia, Kan.	V.	Stock-raising.
GEORGE L. HEINS . . . . Temple Court, 7 Beekman St., New York, N. Y.	IV.	Architect.
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.	Gen. Supt. of the 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, Mass.	III.	With the Thomson-Houston Electric Co.
†FRANK C. MORRISON . . 89 Court St., Boston, Mass.	I.	Engineer and Draughtsman.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
JAMES P. MUNROE . . . . 179 Devonshire St., Boston, Mass.	III.	Of the Firm of Jas. S. Munroe & Co., Paper Manufacturers.
CARRIE L. RICE . . . . . 2534 Arapahoe St., Denver, Colo.	V.	Teacher of Chemistry and Algebra, Denver High School.
WILLIAM T. RIPLEY . . . Tacoma, Washington.	II.	Manufacturer.
HENRY F. ROSS . . . . . Jamaica Plain, Mass.	III.	With Boston Thread & Twine Co.
JOHN H. ROSS . . . Jamaica Plain, Mass.	Elective.	Superintendent, Boston Thread & Twine Co.
†GRENVILLE T. SNELLING . 15 Rue de Buci, Paris, France.	IV.	*Dessinateur supplémentaire au Conservation du Plan de Paris pour l'Exposition de* 1889.
WALTER B. SNOW . . . . Watertown, Mass.	II.	Chief Draughtsman with B. F. Sturtevant & Co., Jamaica Plain.
ANTHONY C. WHITE . . 127 Purchase St., Boston, Mass.	VIII.	With American Bell Telephone Co.

1883.

HERBERT T. BARDWELL . . Parker Hill Ave., Boston, Mass.	I.	Civil Engineer.
GEORGE H. BRYANT . . . Auburn, Ala.	II.	Professor of Mechanic Arts, Alabama Polytechnic Institute.
HARVEY S. CHASE . . . 4 Post Office Square, Boston, Mass.	II.	Agent.
FRANK E. LAVIS . . . . 4 Cushman St., Plymouth, Mass.	II.	Gen. Manager, Atlantic Covering Co.
JOHN G. EPPENDORFF . . Buffalo, N. Y.	IV.	Interior Decorator and Designer.
GEORGE J. FORAN . . . . Sanborn Ave., Dorchester, Mass.	II.	With Geo. F. Blake Manufacturing Co., East Cambridge, Mass.
WILLIAM B. FULLER . . . City Hall Building, Duluth, Minn.	I.	City Engineer.
HORACE B. GALE . . . . 3012 Lucas Ave., St. Louis, Mo.	II.	Professor of Dynamic Engineering, Washington University.
GEORGE H. GUSTIN . . . . 114 Jefferson Ave., Elizabeth, N. J.	III.	Chemist, Bowker Fertilizer Co.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
†FREDERIC O. HARRIMAN . Jaltipan, Mex.	I.	Civil Engineer and Contractor.
†JAMES H. HUTCHINGS . . 1672 Washington St., Boston, Mass.	II.	Real Estate.
H. WARD LEONARD . . . Edison Building, New York, N. Y.	III.	General Manager, Edison General Electric Co.
HARVEY M. MANSFIELD . Fairfield, Me.	III.	Superintendent, Somerset Fibre Co.
ROBERT W. SCOTT . . . 716 Sansom St., Philadelphia, Pa.	II.	Manager, Phila. Heliographic Co., Manufacturers of Blue Print Paper.
GEORGE A. SMITH . . . . Arlington, Mass.	V.	Of the Firm of Thos. Strahan & Co., Manufacturers of Wall Paper, Chelsea, Mass.
FRANK TENNEY . . . . . Steelton, Dauphin Co., Pa.	III.	Purchasing Agent, 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.	Supt., Upton Glue Works, Peabody.
DAVID WESSON . . . . . 225 Eighteenth St., Chicago, Ill.	V.	Chemist, with N. K. Fairbank & Co.

1884.

CHARLES B. APPLETON . . Brookline, Mass.	II.	In Engineer's Office, Atlantic Works, East Boston.
HENRY F. BALDWIN . . . 164 Dearborn St., Chicago, Ill.	II.	Chief Engineer, Chicago & Eastern Ill. 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 Dept., Northern Pacific R. R.
HENRY A. BOARDMAN . . Providence, R. I.	V.	With the Silver Spring Bleaching and Dyeing Co.
CHARLES C. BOTHFELD . . Pittsburgh, Pa.	I.	With Pittsburgh Testing Laboratory.
W. FRANK CARR, B. S. . . 501 Wright Block, Minneapolis, Minn.	I.	Carr & Smith, Civil and Hydraulic Engineers; Proprietors of Dunham System House Drainage.
CHRISTOPHER J. CARVEN . 1604 Dorchester Ave., Dorchester, Mass.	I.	Assistant, Boston Water Works.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
ROSCOE L. CHASE . . . . Arnold Print Works, North Adams, Mass.	V.	Professor of Chemistry, Pennsylvania Museum and School of Industrial Art.
ALFRED O. DOANE . . . Newtonville, Mass.	III.	Assistant City Engineer, City of Newton.
ALFRED L. FITCH . . . . 107 W. Monroe St., Chicago, Ill.	II.	With E. T. Harris.
GEORGE L. R. FRENCH . . Northampton, Mass.	I	Division Roadmaster, B. & M. R. R.
AUGUSTUS H. GILL, Ph. D. Boston, Mass.	V.	Instructor in Gas Analysis and Sanitary Chemistry, Mass. Institute of Technology.
FRANK M. HAINES . . . Portland, Ore.	III.	Land Dept., Northern Pacific R. R.
GEORGE H. HEYWOOD . . 3135 Vernon Ave., Chicago, Ill.	III.	Treasurer, Heywood & Morrill Rattan Co., 1251 West Taylor St.
JAMES G. HOLDER, Ph. G. . 119 Broad St., Lynn, Mass.	V.	Apothecary.
GEORGE F. KNAPP. . . . Lock Box 43, Steelton, Dauphin Co., Pa.	V.	Supt., Blast Furnaces, Pennsylvania Steel Co.
*AMY STANTIAL LUND . .	V.	Died Feb. 11, 1888.
CAPT. D. A. LYLE, U. S. A. Washington, D. C.	III.	Care Bureau of Ordnance.
PHILIP S. MORSE, A. B. . . Salt Lake City, Utah.	III.	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 . . Boston, Mass.	II.	Instructor in Mechanical Engineering, Mass. Institute of Technology.
WILLIAM J. RICH . . . . Washington, D. C.	III.	Fourth Assistant Examiner, U. S. Patent Office.
FRANKLIN B. RICHARDS . Buena Vista, Rockbridge Co., Va.	III.	General Manager, Buena Vista Iron Co.
C. SNELLING ROBINSON . . 113 Eastern Ave., Joliet, Ill.	III.	Chief Chemist, Joliet Works, Illinois Steel Co.
THEODORE W. ROBINSON . 341 Superior St., Bay View Station, Milwaukee.	III.	Superintendent, Blast Furnace Dept., Illinois Steel Co.
A. LAWRENCE ROTCH . . 3 Commonwealth Avenue, Boston, Mass.	II.	Proprietor, Blue Hill Meteorological Observatory, Readville, Mass.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
JOSIAH P. RYDER . . . . 25 Saratoga St., East Boston, Mass.	V.	Teacher, East Boston High School.
ALFRED STEBBINS, JR. . . 915 Valencia St., San Francisco, Cal.	III.	Assistant Engineer, Central Pacific R. R. Co.
ELLIOT T. STURGIS . . . 50 Pearl St., Boston, Mass.	III.	With the Engineering Dept., New England Telephone & Telegraph Co.
ALICE BROWN TYLER . . Ashfield St., Roslindale, Mass.	V.	
HARRY W. TYLER, Ph. D. . Ashfield St., Roslindale, Mass.	V.	Assistant Professor of Mathematics, Mass. Institute of Technology.
NAHUM WARD . . . . . Mt. Seaver Ave., Roxbury,	V.	Chemist, with N. Ward Co.
WILLIAM M. WHITNEY . . Winchendon, Mass.	II.	With Baxter D. Whitney, Manufacturer Wood-working Machinery.
FRANCIS C. WILLIAMS, JR. Lincoln, Neb.	I.	Division Engineer, Burlington & Missouri River R. R.

1885.

CHARLES R. ALLEN . . . New Bedford, Mass.	V.	Teacher of Science in New Bedford High School.
DAVID BAKER . . . . . Sparrow's Pt., Md.	III.	Supt., Blast Furnace Dept., Maryland Extension, Pennsylvania Steel Co.
EDWARD R. BENTON, Ph. D. Newton Centre, Mass.	IV.	Superintendent for McKim, Mead & White, Architects.
HEYWOOD COCHRAN . . . Louisville, Ky.	II.	Draughtsman, with Louisville Bridge and Iron Co.
EDWARD H. DEWSON, JR. . Ellis, Kansas.	II.	District Foreman, U. P. R. R.
FREDERICK FOX, JR., S.M., Ph.D. 202 Brookline St., Boston, Mass.	V.	With State Board of Health.
THOMAS W. FRY . . . . 15 and 17 N. Clinton St., Chicago, Ill.	II.	With Diamond Prospecting Co.
ROBERT R. GOODRICH . . Elkhorn, McDowell Co., W. Va.	III.	Mining Engineer.
WALTER K. HARRINGTON . Green Bay, Wis.	I.	Supt. of Green Bay & Fort Howard Water Works Co.
ELEAZER B. HOMER . . . Boston, Mass.	IV.	Assistant Professor of Architecture, Mass. Institute of Technology.
*FRANK H. LORD	II.	Died Dec. 31, 1890.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
TRACY LYON . . . . . Corner Fourth and Wacouta Streets, 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.	Instructor in Mechanical Engineering, Mass. Institute of Technology.
*EBEN G. MERRILL . . .	I.	Died Oct. 12, 1887.
EVERETT MORSS . . . . 323 Marlboro' St., Boston, Mass.	III.	With Morss & Whyte, Wire Workers.
FREDERICK H. NEWELL . Washington, D. C.	III.	Chief Hydrographer, U. S. Geol. Survey.
JOSEPH E. NUTE . . . . 11 Maple 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 American Telephone & Telegraph Co.
RICHARD H. PIERCE, A. B. Room 8, New Insurance Building, Milwaukee, Wis.	VI.	Agent for Edison General Electric Co.
NEWBERT M. RANDALL . . Steelton, Pa.	III.	Assistant Chemist, Pennsylvania Steel Co.
OTIS T. STANTIAL . . . . 281 Webster Ave., Chicago, Ill.	III.	Chemist, Wm. Deering & Co.
HENRY P. TALBOT, Ph.D. . Boston, Mass.	V.	Instructor in Analytical Chemistry, Massachusetts Institute of Technology.
GEORGE P. VANIER . . . Steelton, Pa.	III.	Chemist, Pennsylvania Steel Co.
ERASTUS WORTHINGTON, JR. Dedham, Mass.	I.	Civil Engineer, Water Works and Sewerage Construction.

1886.

GEORGE F. ABORN . . . . Warren, Mass.	II.	With the Knowles Pump Works.
ARTHUR C. ANTHONY . . 27 Kilby St., Boston, Mass.	III.	Special Agent for the Commonwealth Insurance Co. of New York.
DANA P. BARTLETT . . . Boston, Mass.	VI.	Instructor in Mathematics, Mass. Institute of Technology.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
BIRNEY C. BATCHELLER. . 71 Broadway, New York, N. Y.	II.	Superintendent of the Pneumatic Dynamite Gun Co.
WILLIAM L. BRAINERD . . 230 La Salle St., Chicago, Ill.	IV.	Architect, of firm of Brainerd & Packard.
JOHN K. BURGESS . . . . Howland Falls, Me.	II.	Howland Falls Pulp Co.
CHARLES L. BURLINGHAM . 193 Thirtieth St., Chicago, Ill.	III.	Out of business.
WM. H. CHADBOURN, JR. . Care Seaboard Air Line, Raleigh, N. C.	III.	Consulting Engineer, W. C. & C. R. R.; Assistant Engineer, Seaboard Air Line.
WILLIAM L. CHURCH . . 139 Adams St., Chicago, Ill.	VI.	General Superintendent of Chicago Edison Co.
HARRY E. H. CLIFFORD . Boston, Mass.	VI.	Instructor in Physics, Mass. Institute of Technology.
LOUIS R. COBB . . . . . Chicago, Ill.	I.	Engineering Dept., Chicago Sanitary District.
FRANCIS H. CRANE . . . 12 P. O. Square, Boston, Mass.	VI.	Consulting Engineer, Emerson Power Scale Co.
LOUIS F. CUTTER . . . . Winchester, Mass.	I.	Leveller, Improved Sewerage, City of Boston.
CHARLES C. DOE . . . . 224 Commonwealth Ave., Boston, Mass.	VII.	
ORRIN S. DOOLITTLE . . 148 No. Fourth St., Reading, Pa.	V.	Chemist, Philadelphia & Reading R. R. Co.
JAMES C. DUFF . . . . . La Salle, Ill.	V.	Chemist, Matthiessen & Hegeler Zinc Co.
GEORGE W. FARMER . . . 915 Monroe St., Topeka, Kan.	II.	General Air Brake Inspector, A. T. & S. F. R. R.
*EDWARD S. FOSS	V.	Died Oct. 3, 1890.
FRED E. FOSS, A. B. . . . 203 First Nat. Bank Building, Chicago, Ill.	I.	Resident Engineer, Chicago Union Transfer Ry. Co.
THEODORE R. FOSTER . . Galesburg, Ill.	II.	Asst. to Master Mechanic, Galesburg Div., C. B. & Q. R. R.
ALEX. S. GARFIELD . . . Box 1641, Boston, Mass.	II.	
D. LEWIS K. HATHAWAY . Warren, Mass.	II.	Draughtsman at Knowles Pump Works.

NAME AND RESIDENCE	COURSE.	OCCUPATION.
EDWARD E. HIGGINS . . Box 3067, New York, N. Y.	VI.	With Edison General Electric Co., Edison Building.
WILLIAM J. HOPKINS . . . 620 Atlantic Ave., Boston, Mass.	VI.	With Thomson-Houston Elec. Co., Railway Dept.
WALTER R. INGALLS . . 229 Ocean St., Lynn, Mass.	III.	Mining Engineer.
WILLIAM F. JORDAN . . . Rochester, N. Y.	I.	Assistant Engineer, Buffalo, Rochester & Pittsburgh R. R.
C. BELLE KENNEY . . . . 111 Saratoga St., East Boston, Mass.	V.	Teacher of Chemistry, High School, Portsmouth, N. H.
†JOHN A. McC. LAWRENCE, 1364 South Thirteenth St., Denver, Colo.	II.	
ALBERT E. LEACH . . . . 87 Milk St., Boston, Mass.	II.	Solicitor of Patents, with W. B. H. Dowse, Counsellor-at-Law.
FRANK L. LOCKE . . . . 36 Hancock St., Boston, Mass.	I.	In City Engineer's Office, Boston, Mass.
WILSON H. LOW . . . . Eighteenth and Blackwell Streets, Chicago, Ill.	V.	Chemist, with N. K. Fairbank & Co.
ELGOOD C. LUFKIN . . . Lima, Ohio.	II.	Chief Engineer, Chicago Division, National Transit Co.
JAMES P. LYNDE . . . . 37 and 39 Main St., Palmer, Mass.	IX.	Druggist
ALEX. R. McKIM . . . . Wilmington, Del.	I.	Draughtsman, Edge Moor Bridge Works.
HARRY B. MERRIAM . . . Buena Vista, Colo.	I.	Road Master, Union Pacific Railway.
HENRY P. MERRIAM . . . 11 Charlton St., New York, N. Y.	VI.	With The American Fuse Manufacturing Co.
EDWARD F. MILLER . . . Boston, Mass.	II.	Instructor in Mechanical Engineering, Mass. Institute of Technology.
EDGAR H. MUMFORD. . . 200 McDougal Av., Detroit, Mich.	II.	Superintendent, Russel Wheel & Foundry Co.
ARTHUR A. NOYES, S. M., Ph.D. Newburyport, Mass.	V.	Instructor in Analytical Chemistry, Mass. Institute of Technology.
EDWARD L. PIERCE, JR. . Bennington, N. H.	II.	With the Monadnock Paper Mills.
†GEORGE F. REYNOLDS . . Care Charles S. Levy, Johannesburg, So. Africa.	II.	With the M. C. Bullock Manufacturing Co.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
CHARLES F. RICHARDSON . 7 Walnut St, Boston, Mass.	II.	Lawyer.
ARTHUR G. ROBBINS . . . Boston, Mass.	I.	Instructor in Civil Engineering, Mass. Institute of Technology.
L. KIMBALL RUSSELL . . . Arlington, Mass.	V.	
JOHN F. SEAVEY . . . . Lowell, Mass.	II.	In City Engineer's Office.
WILLIAM E. SHEPARD . . 67 College St., Middletown, Conn.	VI.	Electrician, of the Schuyler Electric Co.
JAMES E. SIMPSON . . . . 163 Haverhill St., Lawrence, Mass.	III.	With J. R. Simpson & Co.
THEODORE STEBBINS . . . Boston, Mass.	VI.	Railway Department, Thomson-Houston Elec. Co.
AUGUSTUS B. STOUGHTON . 914 Walnut St., Philadelphia, Pa.	II.	Attorney-at-Law, Patents and Patent Cases.
WILLIAM M. TAYLOR . . . Indianapolis, Ind.	II.	Secretary of Chandler & Taylor.
CHARLES D. TURNBULL . . 67 Chauncy St., Boston, Mass.	II.	In Treasurer's Office of the Cochrane Carpet Co.
DAVID VAN ALSTINE . . . 44½ Prytania St., New Orleans, La.	II.	General Foreman, Louisville & Nashville R. R.
MAURICE A. VIELÉ, B. S. . 324 St. Nicholas Ave., New York, N. Y.	II.	Engineer Corps, new Croton Aqueduct.
†C. MORRIS WILDER . . . Cincinnati, Ohio.	VI.	Electrical Engineer, Weir Frog Co.
ELWOOD J. WILSON . . . . Cliff, Custer Co., Idaho.	III.	Superintendent, Idaho Copper Co.
CHARLES WOOD . . . . . 200 W. Fourth St., Cincinnati, Ohio.	I.	Acting Chief Engineer, C. H. & D. R. R.
CHARLES H. WOODBURY . . 125 Johnson St., Lynn, Mass.	II.	Artist.
VERNOR F. WORCESTER . . 36 Pine St., Rutland, Vt.	II.	In Draughting Department, Howe Scale Co.
FRED. R. YOUNG . . . . . 157 Summer St., Boston, Mass.	III.	In business.

1887.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
GEORGE A. ARMINGTON . . 1 Woodward Pl., Cleveland, Ohio.	II.	With Otis Steel Co., Limited.
SIDNEY R. BARTLETT . . . 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 Maine Sts., Louisville, Ky.	I.	Assistant Engineer, Maintenance of Way, Louisville Division, P. C. C. & St. L. R. R.
WALTER C. BRACE . . . . Box 237 Rico, Dolores Co., Colo.	III.	Manager, Rico Ore Market.
DWIGHT BRAINERD . . . . 103 St. François Xavier, Montreal, P. Q.	IX.	Secretary, Hamilton Powder Co.
HENRY B. BRAINERD . . . 103 St. François Xavier, Montreal, P. Q.	IX.	Dominion Cartridge Co.
HENRY F. BRYANT . . . . Room 2, Town Hall, Brookline, Mass.	I.	With A. H. French, Civil Engineer.
FRANK G. BURGESS . . . . 222 Sutter St., San Francisco, Cal.	I.	Engineering Dept., Southern Pacific R.R.
JULIAN A. CAMERON . . . Graniteville, Mass.	II.	With Abbot Worsted Mills.
FRANK D. CARNEY . . . . Steelton, Pa.	III.	With Pennsylvania Steel Co.
WINTHROP COLE . . . . 51 Jefferson St., Newton, Mass.	II.	With E. D. Leavitt, Mechanical Engineer, Cambridgeport, Mass.
HENRY J. CONANT . . . . 85 Water St., Boston, Mass.	II.	With the Evans Friction Cone Co.
HELEN COOLEY . . . . . Los Angeles, Cal.	V.	Teacher of Chemistry, State Normal School.
RALPH E. CURTIS . . . . Portland, Me.	II.	Draughtsman with Portland Co.
WILLIAM C. CUSHING, M. A. Indianapolis, Ind.	I.	Engineer, Maintenance of Way, C. St. L. & P. R. R. First Div.
SARAH L. DAY, A. B. . . . 280 Newbury St., Boston, Mass.	V.	Water Analyst, State Board of Health.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
WALTER C. FISH . . . . 620 Atlantic Ave., Boston, Mass.	VI.	With Thomson-Houston Electric Co.
JOHN M. FOX . . . . . 77 State St., Portland, Me.	VI.	With Eureka Electric Co., 18 Broadway, New York City.
JOSEPH B. GAY . . . . . 68 Devonshire St., Boston, Mass.	IV.	With Hartwell & Richardson, Architects.
WALTER H. GLEASON . . . 12 Faneuil Hall Market, Boston, Mass.	V.	With W. Gleason & Co., Fruit Commissioners.
WILLIAM S. HADAWAY, JR. 71 Pinckney St., Boston, Mass.	VIII.	Supt., Schaefer Electric Mfg. Co., Cambridgeport, Mass.
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. . . . . 620 Atlantic Ave., Boston, Mass.	II.	Thomson-Houston Motor Co.
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.	In charge of Color Shop and Dye Houses, Passaic Print Works.
WILLIAM D. LIVERMORE . 45 Soley St., Charlestown, Mass.	V.	Chemist, Washington Mills, Lawrence, Mass.
PHILIP A. MOSMAN . . . 489 Milwaukee St., Milwaukee, Wis.	III.	With Illinois Steel Co.
SAMUEL P. MULLIKEN, Ph.D. 216 High St., Newburyport, Mass.	V.	
GEORGE L. NORRIS . . . Pencoyd, Pa.	III.	Chemist, Pencoyd Iron Works.
GEO. W. PATTERSON, JR., A.B. Ann Arbor, Mich.	VI.	Instructor in Physics, University of Michigan.
QUINTARD PETERS . . . . 488 Peachtree St., Atlanta, Ga.	IX.	Secretary, Peters Land Co.
HERBERT A. RICHARDSON . 14 Central St., Room 33, Lowell, Mass.	V.	Chemist for White Brothers & Co., Lowell, Mass.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
FRANZ H. SCHWARZ . . . Lawrence, Mass.	II.	Draughtsman, Pacific Mills.
HENRY D. SEARS . . . . 89 State St., Boston, Mass.	VI.	Purchasing Agent, Thomson Electric Welding Co.
FRANK E. SHEPARD . . . 1622 Arapahoe St., Denver, Colo.	II.	Mechanical Engineer of the firm of Thomas, Shepard & Searing.
CHARLES P. SMITH . . . Norwich, Conn.	II.	Draughtsman, C. B. Rogers & Co., Manufacturers of Wood-working Machinery.
HARRY E. SMITH . . . . Milwaukee, Wis.	V.	Chemist, C. M. & St. P. Ry.
J. WALDO SMITH . . . . Newfoundland, N. J.	I.	Resident Engineer, East Jersey Water Co.
HENRY SOUTHER, JR. . . Steelton, Pa.	III.	Pennsylvania Steel Co.
HOLLON C. SPAULDING . . 620 Atlantic Ave., Boston, Mass.	II.	General Manager, Thomson-Houston Motor Co.
TIMOTHY W. SPRAGUE . . 620 Atlantic Ave., Boston, Mass.	III.	With Thomson-Houston Motor Co.
JAMES H. STANWOOD . . . 35 Rutland Sq., Boston, Mass.	I.	Instructor in Civil Engineering, Mass. Institute of Technology.
HENRY F. STODDARD . . Bushwick Ave. and Siegle St., Brooklyn, N. Y.	II.	With Wm. Walls' Sons, Cordage Manufacturers.
GILES TAINTOR . . . . . 44 Front St., Worcester, Mass.	VI.	Assistant Manager, Worcester Telephone Exchange.
EDWARD G. THOMAS . . . 69 Arapahoe Building, Denver, Colo.	II.	Of the firm of Thomas, Shepard & Searing, Mechanical and Electrical Engineer.
FREDERICK THOMPSON . . . 1322 N. Y. Ave., Washington, D. C.	I.	Asst. Engineer, Richmond & Danville R. R. System.
†WALTER S. THOMPSON . . Tacoma, Wash.	I.	Draughtsman.
GREENLEAF R. TUCKER . . Boston, Mass.	V.	Asst. Professor of General and Pharmaceutical Chemistry, Mass. College of Pharmacy; Chemist, Boston City Hospital.
H. JUDSON TUCKER . . . Masonic Temple, Denver, Colo.	VI.	With the Edison General Electric Co.
ALEXANDER H. TWOMBLY . Gardiner, Me.	II.	Mechanical Engineer with S. D. Warren & Co.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
RALPH VOSE . . . . . 25 Sunnyside St., Hyde Park, Mass.	VI.	Electrician, with Schaefer Electric Mfg. Co., Cambridgeport, Mass.
WALTER G. WHITMORE . . 44 Broad St., New York, N. Y.	VI.	Asst. District Engineer, Eastern District, Edison General Electric Co.
GRANGER WHITNEY . . . 408 E St., Sparrow's Point, Md.	III.	With Pennsylvania Steel Co.
WILLIAM A. WHITNEY . . Sunapee, N. H.	I.	Superintendent, Lake Sunapee Wood Pulp Co.
HERBERT A. WILCOX . . Soudan, St. Louis Co., Minn.	III.	Mining Engineer, Minnesota Iron Co.
SIDNEY WILLIAMS . . . . 15 Arlington St., Boston, Mass.	I.	

1888.

HENRY D. BATES . . . . Boston, Mass.	IV.	Engaged in publishing the "Technology Architectural Review."
HENRY F. BIGELOW . . . Clinton, Mass.	IV.	Architect.
HERBERT S. BIRD . . . . 601 North Eighteenth St., Omaha, Neb.	V.	Asst. Chemist, Laboratory U. P. R. R.
WINSLOW BLANCHARD . . Harley St., Dorchester, Mass.	II.	With the Metropolitan Sewerage Commission of Massachusetts.
ARTHUR T. BRADLEE . . 202 Devonshire St., Boston, Mass.	II.	With Harding, Whitman & Co.
BENJAMIN G. BUTTOLPH . 165 West Canton St., Boston, Mass.	II.	With Boston Manufacturers' Mutual Fire Ins. Co.
ELBRIDGE S. CARLETON . . Rochdale, Mass.	IV.	With Cutting & Forbush, Architects.
DAVID A. CENTER . . . . 7 Sumner St., Cambridge, Mass.	VI.	Student in Mathematics at Harvard University.
STEPHEN CHILD . . . . 19 Chapin Block, Buffalo, N. Y.	I.	Asst. Superintendent, Barber Asphalt Paving Co.
GEORGE E. CLAFLIN . . . St. Louis, Mo.	VI.	District Engineer, Westinghouse Electric Co.
SYLVANUS H. COBB . . . 232 Fairmount Ave , Hyde Park, Mass.	VI.	With Electrical Safety Co.

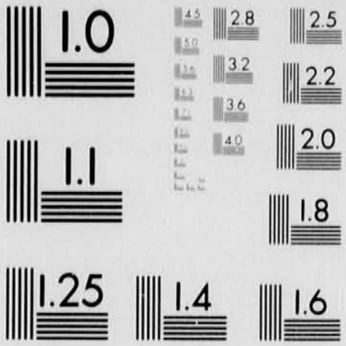
NAME AND RESIDENCE.	COURSE.	OCCUPATION.
RUSSELL H. COLBY . . . Fox and Root Sts., Aurora, Ill.	V.	Supt.'s Asst., C. & A. Smelting & Refining Co.
FRED B. COLE . . . . . Central Sq., Cambridgeport, Mass.	II.	With E. D. Leavitt, Mechanical Engineer.
BERTRAND R. T. COLLINS . 87 Appleton St., Boston, Mass.	II.	Instructor in Mechanical Engineering, Mass. Institute of Technology.
EDWARD COLLINS, JR. . . 985 Adams St., Mattapan, Mass.	VI.	Instructor in Physics, Mass Institute of Technology.
ARTHUR J. CONNER . . . Box 2853, Boston, Mass.	V.	Treasurer, New England Chemical Co.
RICHARD DEVENS . . . . Stamford, Conn.	II.	With Yale & Towne Manufacturing Co.
EDGAR F. DUTTON . . . 534 Warren St., Boston, Mass.	VI.	With F. M. Kimball & Co., Electrical Engineers, in charge of Experimental and Testing Dept.
HENRY F. EASTMAN . . . 138 Appleton St., Lowell, Mass.	II.	With Middlesex Mch. Co. of Lowell, Mass.
ALFRED B. ELLSWORTH . . Union Bridge Co., Athens, Pa.	I.	Resident Engineer, Pittsburgh Testing Laboratory.
RICHARD EPPES, JR. . . . City Point, Va.	II.	Manager, Appomattox Plantations.
LOUIS A. FERGUSON . . . 139–141 Adams St., Chicago, Ill.	VI.	Electrician, Chicago Edison Electric Co.
BERTRAM P. FLINT . . . Pencoyd, Pa.	II.	Pencoyd Iron Works.
THEODORE A. FOQUE . . . 40 Eastman Ave., Minneapolis, Minn.	II.	Engineer of Tests, Minn., St. Paul & Sault Ste. Marie R. R.
STEJIRO FUKUZAWA . . . Hiogo, Japan.	I.	Sanyo Railway Co.
J. EDWARD FULLER, JR. . 452 Main St., Worcester, Mass.	IV.	Building Supt. for J. G. Vandreuil, 91 Foster St.
WILLIAM H. GERRISH . . 126 Pawtucket St., Lowell, Mass.	II.	Superintendent, Lancaster Slate Co.
IRVING G. GREENE . . . 41 Munroe St, Roxbury, Mass.	I.	
HAROLD G. GROSS . . . . 23 Union Park, Boston, Mass.	VII.	Student, Harvard Medical School.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
GEORGE W. HAMBLET . . 500 Lowell St., Lawrence, Mass.	II.	Assistant in Mechanical Engineering, Mass. Institute of Technology.
WILLIAM L. HARRIS . . . 6 Louisburg Square, Boston, Mass.	VII.	Student, Harvard Medical School.
GEORGE L. HARVEY . . . 1702 Prairie Ave., Chicago, Ill.	II.	With Harvey Steel Car Co.
CHARLES F. HASTINGS . . 229 Walnut St., Steelton, Pa.	III.	With Pennsylvania Steel Co.
SAVORY C. HATHAWAY, JR. Fort Payne, Ala.	VI.	Secretary and Treasurer, Fort Payne Furnace Co.
GEORGE L. HEATH. . . . So. Lake Linden, Mich.	V.	With Calumet & Hecla Smelting Co.
EDWARD W. HERRICK . . Northampton, Mass.	II.	With B. F. Sturtevant, Jamaica Plain, Mass.
EDWARD C. HOLTON . . . Winchester, Mass.	V.	Assistant in General Chemistry, Mass. Institute of Technology.
HENRY J. HORN, JR. . . . Helena, Mont.	I.	Chief Draughtsman, N. P. & M. R. R.
FRANK M. JAMES . . . . 36 East Third St., St. Paul, Minn.	II.	Real Estate.
ARTHUR W. JONES . . . . 180 Summer St., Boston, Mass.	VI.	Engineer of the Thomson-Houston International Electric Co.
EDWIN O. JORDAN . . . . Worcester, Mass.	VII.	Fellow in Biology, Clark University.
WILLIAM T. KEOUGH . . . East Boston, Mass.	II.	With the Atlantic Works.
GEORGE S. LEE . . . . . Wave Ave., Revere, Mass.	I.	With F. L. Fuller, Civil Engineer, 12 Pearl St., Boston.
JAMES W. LOVELAND . . . 25 Princeton St., East Boston, Mass	V.	Chemist, Curtis, Davis & Co., Cambridgeport, Mass.
ARTHUR S. MANN . . . . 2 Central Sq., Cambridgeport, Mass.	II.	With E. D. Leavitt, Mechanical Engineer.
GEORGE V. MCLAUTHLIN . Boston, Mass.	V.	Assistant in Biology, Mass. Institute of Technology.
CHARLES G. MERRELL . . . Box 786, Cincinnati, Ohio.	V.	Supt., W. S. Merrell Chemical Co.
FRANK A. MOORE . . . . 121 East Twenty-first Street, New York, N. Y.	IV.	With R. M. Hunt, Architect.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
HARRY C. MOORE . . . . Greytown, Nicaragua.	II.	Mechanical Engineer, Nicaragua Canal Construction Co.
ADDISON D. NICKERSON . . Kenova, W. Va.	I.	Draughtsman, Ohio Extension N. & W. R. R
EDWIN R. PEARSON . . . . Cambridgeport, Mass.	VI.	With the Schaefer Electric Manufacturing Co.
CHARLES A. PETERSON, A. B. Boston, Mass.	VI.	
HERBERT F. PIERCE . . . South Braintree, Mass.	I.	With F. L. Fuller, Civil Engineer, 12 Pearl St., Boston.
GEORGE B. POOL . . . . . 3604 Washington St., Jamaica Plain, Mass.	VI.	Expert with Thomson Electric Welding Co.
JOHN RAY . . . . . 537 Sixteenth St., Denver, Colo.	II.	Asst. Superintendent, Construction Edison General Electric Co.
RUSSELL ROBB . . . . . 89 State St., Boston, Mass.	VI.	With Thomson Electric Welding Co.
ODIN B. ROBERTS, A. B. . . 81 Mt. Vernon St., Boston, Mass.	II.	Student, Harvard Law School.
ANNIE W. SABINE, M. A. 53 Trowbridge St., Cambridge, Mass.	VIII.	Student.
FREDERICK H. SAFFORD . . Wolfeborough, N. H.	VI.	Instructor in Science and Mathematics, Brewster Free Academy.
ALFRED H. SAWYER . . . Box 522, Concord, Mass.	II.	With B. F. Sturtevant Blower Works, Jamaica Plain.
FREDERICK L. SAYER . . . 95 Liberty St., New York, N. Y.	II.	With the Geo. F Blake Manufacturing Co.
WALTER K. SHAW . . . . Lexington, Mass.	II.	Cotton Business, 48 Congress St., Boston.
IVAR L. SJÖSTRÖM . . . . Chehalis, Wash.	I.	Topographer, Northern Pacific R. R.
CLARENCE W. SMITH, A. B. 86 Prospect St., Cambridge, Mass.	V.	
EDWARD M. SMITH . . . . North Hampton, N. H.	II.	Engineering Dept. B. & M. R. R.
FRANK O. STETSON . . . . Salem, Va.	V.	Chemist, Salem Furnace Co.
CHARLES A. STONE . . . . 4 Post Office Sq., Boston, Mass.	VI.	With Mass. Electrical Engineering Co.
JOHN M. SULLY . . . . . Chattanooga, Tenn.	III.	With Nier, Hartford & Mitchell, Civil Engineers and Metallurgists.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
MARION TALBOT, A. M. . . 66 Marlboro' St., Boston, Mass.	IX.	Instructor in Domestic Science, Wellesley College; Secretary of the Association of Collegiate Alumnæ.
WALTER I. TOWNE . . . . 50 Pearl St., Boston, Mass.	VI.	With N. E. Telephone and Telegraph Co.
CLARENCE B. VORCE . . . 10 W. Second St., Elyria, O.	I.	Engineering Corps L. S. & M. S. R. R.
A. SYDNEY WARREN . . . Norway, Mich.	III.	Asst. Superintendent, Aragon Mining Co.
EDWIN S. WEBSTER . . . 4 Post Office Sq., Boston, Mass.	VI.	Mass. Electrical Engineering Co.
CHARLES L. WEIL . . . . East Cambridge, Mass.	II.	With Geo. F. Blake Mfg. Co.
ARTHUR S. WILLIAMS . . . 18 Cortlandt St., New York, N. Y.	VI.	With American Telephone and Telegraph Co.
AMOS E. WOODWARD . . . Jefferson City, Mo.	III.	Assistant Geologist, Geological Survey of Missouri.
JOHN E. YOUNG . . . . . 404 Washington Block, Tacoma, Wash.	I.	Vice-President and Treasurer, Excelsior Pile Coating Co.
		1889.
GEORGE M. BASFORD . . . Omaha, Neb.	II.	In Testing Department Union Pacific R. R.
EDWARD J. BEACH . . . . 1183 Locust St., Dubuque, Iowa.	V.	Superintendent, James Beach's Soap Factory.
†ARTHUR B. BELLOWS . . . 95 Fifth Ave., Pittsburgh, Pa.	II.	Inspector, PittsLurgh Testing Laboratory.
WILLARD G. BIXBY . . . . 45 Summer St., Salem, Mass.	II.	With American Bell Telephone Co., 127 Purchase St., Boston.
ZENAS W. BLISS . . . . . P. O. Box 1545, Providence, R. I.	II.	With Providence Machine Co.
CHARLES N. BORDEN . . . 89 Rock St., Fall River, Mass.	II.	Travelling in Europe.
FREDERICK W. BRADLEY . 27 Front St., Schenectady, N. Y.	VI.	Electrical Engineer, Edison General Electric Co.
FREDERICK H. BRAINERD . 3179 Ashland Ave., Chicago, Ill.	III.	In Laboratory of the Union Steel Works.
LUTHER W. BRIDGES . . . Warren, Mass.	II.	Draughtsman, with Knowles Steam Pump Works.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
JOSEPH N. BULKLEY . . . Lynn, Mass.	VI.	With Thomson-Houston Electric Co.
FRANK H. CILLEY . . . . 677 Dudley St., Dorchester, Mass.	I.	Student.
FRED CRABTREE . . . . . McKeesport, Penn.	V.	Chemist, Mononghahela Furnace Co.
HENRY A. CRAIGIN . . . . Omaha, Neb.	II.	Chief Inspector, Union Pacific System.
CHARLES H. CROMWELL . . Baltimore, Md.	II.	With Columbian Iron Works & Dry Dock Co.
ROLAND N. CUTTER . . . Box 78, Mullan, Idaho.	I.	Draughtsman, Northern Pacific & Montana R. R.
FRANK L. DAME . . . . . Portland, Ore.	VI.	District Engineer, Westinghouse Electric Co.
WILLIAM S. DAVENPORT . . 2 Homer Place, Roxbury, Mass.	V.	Assistant in General Chemistry, Mass. Institute of Technology.
ARTHUR L. DAVIS . . . . Welden House, St. Albans, Vt.	II.	Engineer, Vermont Construction Co.
CHARLES B. DODGE . . . 16 Hancock St., Boston, Mass.	IX.	With George H. Chapin, Real Estate, 257 Washington St.
NATHAN DURFEE . . . . 33 St. James Ave., Boston, Mass.	II.	Engineering Dept., Metropolitan Sewerage Commission.
HARRISON G. DYAR . . . Rhinebeck, N. Y.	V.	Entomologist.
ARTHUR V. EDWARDS . . Milton, Mass.	IV.	Draughtsman, with Brigham & Spofford, Architects, Boston, Mass.
JONATHAN P. B. FISKE . . Auburndale, Mass.	VI.	With Thomson-Houston Electric Co., Lynn.
ALFRED W. FRENCH . . . West Roxbury, Mass.	I.	Assistant in Civil Engineering, Mass. Institute of Technology.
EDWARD V. FRENCH . . . 18 Park St., Lynn, Mass.	II.	Instructor in Mechanical Engineering, Mass. Inst. of Technology.
HOLLIS FRENCH . . . . 200 Commonwealth Ave., Boston, Mass.	VI.	With Thomson-Houston Electric Co., Lynn, Mass.
EARL W. GANNETT . . Omaha Savings Bank, Omaha, Neb.	VI.	Travelling in Europe.
JAMES P. GILBERT . . . . Milwaukee, Wis.	V.	In Laboratory of the C. M. & St. P. R. R.
BENJAMIN W. GUPPY. . . Jamaica Plain, Mass.	I.	Assistant Engineer, B. & M. R. R.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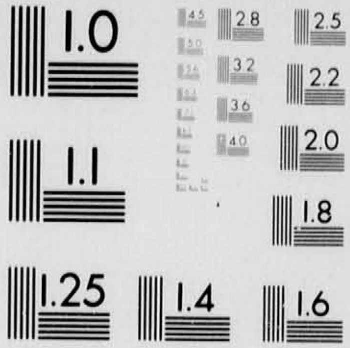
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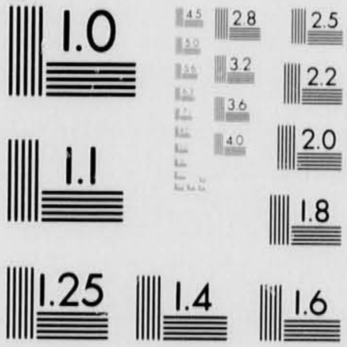
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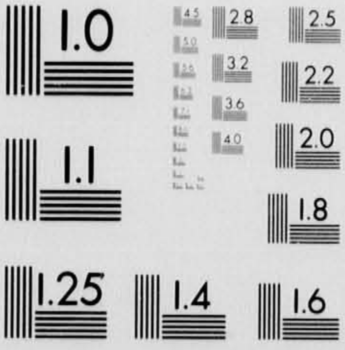
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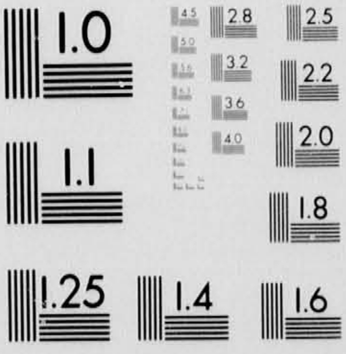
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M.I.T. ANNUAL CATALOGUES AND BULLETINS
1890/91

03 OF 03

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
HENRY M. HOBART . . . 2 Westland Ave., Boston, Mass.	VI.	With Thomson-Houston Electric Co.
FRANKLIN W. HOBBS . . Boylston St., Brookline, Mass.	II.	Assistant in Descriptive Geometry, Mass. Institute of Technology.
GEORGE U. G. HOLMAN . 403 Sibley St., St. Paul, Minn.	VI.	With Northwest Thomson-Houston Electric Co.
RICHARD HOOKER . . . . 19 Whiting St., Roxbury, Mass.	IV.	Draughtsman, with Longfellow, Alden & Harlow, Boston, Mass.
FREDERICK L. HOPKINS . . Providence, R. I.	V.	Chemist, Silver Spring Bleaching & Dyeing Co.
HARRY H. HUNT . . . . 74 Prospect St., Melrose, Mass.	VI.	With Thomson-Houston Electric Co.
EDWARD S. HUTCHINS . . Phœnix House, Bath, Me.	II.	With Bath Iron Works.
LEWIS E. JOHNSON . . . . Wilmington, Del.	II.	With Edgemoor Bridge Co.
WILLIAM S. JOHNSON . . 13 Beacon St., Boston, Mass.	I.	With the Massachusetts State Board of Health.
WALTER H. KILHAM . . . Beverly, Mass.	IV.	Instructor in Architecture, Mass. Institute of Technology.
ARTHUR D. KINSMAN . 291 Webster Ave., Muskegon, Mich.	VIII.	Instructor in Mathematics and Natural Science in High School.
LEWIS H. KUNHARDT . . 89 Franklin St., Melrose Highlands, Mass.	II.	Plan Department, Associated Mutual Insurance Co., Boston, Mass.
GEORGE B. LAUDER . . . Westinghouse Electric Co., Pittsburgh, Pa.	VI.	Engineering Corps Westinghouse Electric Co.
FRANK A. LAWS . . . . Boston, Mass.	VI.	Assistant in Physics, Mass. Institute of Technology.
WILLIAM W. LEWIS . . . Box 183, Taunton, Mass.	II.	Foreman of Draughting Room, Taunton Locomotive Mfg. Co.
JOHN W. LINZEE, JR., A.B. . 3 Ashburton Pl., Boston, Mass.	I.	Draughtsman, Boston Manufacturer's Mutual Fire Insurance Co.
HARRISON LORING, JR. . . 789 Broadway, So. Boston, Mass.	II.	With Harrison Loring, City Point Works, So. Boston.
SAMUEL H. MILDRAM . . Wood St., Neponset, Mass.	I.	Surveyor and Draughtsman, Associated Mutual Factory Insurance Companies.
WILLIAM E. MOTT . . . Burlington, N. J.	I.	

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
CLAYTON W. PIKE . . . Philadelphia, Pa.	VI.	Instructor in Electrical Engineering, University of Pennsylvania.
CHARLES W. POWER . . . 39 West Housatonic St., Pittsfield, Mass.	VI.	With D. M. Collins & Co., Proprietors of Berkshire Knitting Mills.
FRED W. RANNO . . . . Toledo, Ohio.	I.	Assistant on Engineering Corps, L. S. & M. S. R. R.
GEORGE L. RICHARDSON . San Rafael, Cal.	I.	With Geo. M. Dodge, County Surveyor.
GEORGE W. ROUNDS . . . 620 Atlantic Ave., Boston, Mass.	VI.	Railway Dept., Thomson-Houston Elec. Co.
RICHARD L. RUSSEL . . . Pottsville, Pa.	I.	Assistant Engineer, Norfolk & Western R. R.
FRANK E. SANBORN . . . Brooklyn, N. Y.	II.	Instructor in Mechanics, Pratt Institute.
ALBERT SAUVEUR . . . . South Chicago, Ill.	III.	With the Illinois Steel Co., South Works.
EDWARD V. SHEPARD . . 61 Lafayette St., Salem, Mass.	I.	With I. K. Harris, Civil Engineer & Surveyor, Lynn, Mass.
WILLIAM G. SNOW . . . Watertown, Mass.	II.	With B. F. Sturtevant, Jamaica Plain, Mass.
DELIA STICKNEY . . . . 8 Centre Street, Cambridgeport, Mass.	V.	Instructor in Chemistry, Cambridge English High School.
G. GOODWIN STONE . . . Chicago, Ill.	III.	Illinois Steel Co., South Works.
RALPH SWEETLAND . . . Natick, Mass.	II.	With Thomson-Houston Co.
SANFORD E. THOMPSON . . Care Alpena Sulphite Fibre Co., Alpena, Mich.	I.	With the Manufacturing Investment Co. of New York.
FRANK H. THORP . . . . 285 Columbus Ave., Boston, Mass.	V.	Assistant in Industrial Chemistry, Mass. Institute of Technology.
WILLIAM B. THURBER, M. S. Plymouth, Mass.	IX.	With New England Telephone and Telegraph Co.
ARTHUR E. TRUESDELL . . Box 1024, Sioux City, Ia.	VI.	With Sioux City Electric Co.
WILLIAM W. UNDERHILL . 45 Kilby St., Boston, Mass.	II.	With Smead Warming & Ventilating Co.
CHARLES H. WARNER . . New York, N. Y.	VI.	With Thomson-Houston Electric Co.
GEORGE C. WHIPPLE . . . 242 Chestnut St., Chelsea, Mass.	I.	Biologist, Boston Water Works.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
JASPER WHITING . . . . 3179 Ashland Ave., Chicago, Ill.	III.	With Illinois Steel Co.
†FRANK P. WHITNEY . . Adams St., Dorchester, Mass.	VI.	In Railway Dept., Thomson-Houston Electric Co.
ROBERT C. WILLIAMS . . Crystal Falls, Mich.	III.	Mining Engineer and Chemist, Kniffle Mfg. Co.
ARTHUR L. WILLISTON . . Portland, Oregon.	II.	Assistant to Division Engineer of Pacific Division, U. P. R. R.
VICTOR WINDETT . . . . 2522 Calumet Ave., Chicago, Ill.	II.	With Illinois Steel Co.
CAROLINE A. WOODMAN, A.M. Wellesley, Mass.	VII.	Instructor in Physiology, Wellesley College.
WALTER G. WUICHET . . 346 W. First St., Dayton, Ohio.	II.	Draughtsman, with Stilwell Bierce Manufacturing Co., Dayton, O.

1890.

ARTHUR H. ADAMS . . . Newton, Mass.	II.	Graduate Student, Mass. Institute Technology.
CHARLES H. ALDEN, JR. . 2 Park Square, Boston, Mass.	IV.	Draughtsman with Cram & Wentworth, Architects.
FRANK W. ATWOOD . . . Lonsdale, R. I.	V.	Assistant Manager, Lonsdale Bleachery.
ARTHUR W. AYER . . . . 71 Broadway, Room 69, New York, N. Y.	II.	With Pneumatic Dynamite Gun Co.
CYRUS C. BABB . . . . . Washington, D. C.	I.	U. S. Geological Survey.
JOSEPH B. BAKER . . . . Girard Building, Philadelphia, Pa.	VI.	Electrical Engineer with C. M. Blanchard, Electrical Contractor.
HIRAM E. BALDWIN . . . Pittsburgh, Pa.	I.	Inspector, Pittsburgh Testing Laboratory.
SPAULDING BARTLETT . . Webster, Mass.	V.	
JOHN L. BATCHELDER, JR. 356 Federal Street, Boston, Mass.	VII.	With Batchelder Bros.
CHARLES B. BEASOM . . . Hamilton Building, Fifth Ave., Pittsburgh, Pa.	II.	Construction Superintendent, Pittsburgh Metallurgical Co.
ELIZABETH E. BICKFORD . Baltimore, Md.	VII.	Teacher of Science in Bryn Mawr School.
JOHN B. BLOOD . . . . . 70 Elm St., Lynn, Mass.	VI.	Engineer with Thomson-Houston Co.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
AUSTIN D. BOSS . . . . Boston, Mass.	II.	Assistant in Mechanical Drawing, Mass. Institute of Technology.
EDWARD F. BRAGG . . . 226 Devonshire Street, Boston, Mass.	II.	With Boston Woven Hose Co.
LOTTIE A. BRAGG . . . . Braggville, Mass.	V.	Instructor in Chemistry, Wellesley College.
EDWARD D. BROWN . . . Reading, Mass.	VI.	With American Bell Telephone Co., Boston, Mass.
ERNEST H. BROWNELL, A. B. Wilmington, Del.	I.	Assistant Engineer, U. S. Engineer's Office.
EDWARD C. BURNHAM, A. B. 14 Hawes St., Pawtucket, R. I.	II.	In Draughting Office, R. I. Locomotive Works, Providence, R. I.
GARY N. CALKINS . . . . 102 Charles St., Boston, Mass.	IX.	Assistant Biologist, State Board of Health, Lecturer Mass. Institute of Technology.
MORTEN CARLISLE . . . . 403-405 Sibley Street, St. Paul, Minn.	VI.	With N. W. Thomson-Houston Electric Co.
CHESTER V. CARLTON . . Lincoln, Neb.	I.	Assistant Engineer, B. & M. R. R. R. Engineering Department.
JAMES A. CARNEY . . . . Lowell, Mass.	V.	
GEORGE D. CHAPMAN . . 17 St. James Ave., Boston, Mass.	II.	Assistant in Mechanical Drawing, Mass. Institute of Technology.
FRANK L. CHASE . . . . Box 143, Olympia, Wash.	I.	Assistant Engineer, U. P. R. R.
JAMES CLARK, JR. . . . 1214 Third St., Louisville, Ky.	VI.	With Ohio Valley Telephone Co.
WILLIAM H. COLLINS . . 270 Pine St., Providence, R.I.	V.	With Silver Spring Bleaching and Dyeing Co.
WALTER F. COOK . . . . 332 Boston St., Dorchester, Mass.	IX.	With T. D. Cook & Co., 23 Avon St., Boston.
JOHN G. CRANE . . . . 38 E. Utica St., Buffalo, N.Y.	I.	With the Barber Asphalt Paving Co.
DARRAGH DE LANCEY . . Rochester, N. Y.	II.	Mechanical Engineer, the Eastman Company.
ALEXANDER J. DELANO . . 231 Dudley St., Boston, Mass.	I.	Engineering Corps, L. S. & M. S. Ry. M. S. Division.
JOHN O. DEWOLF . . . . 14 Winthrop St., Boston, Mass.	II.	Assistant in Mechanical Engineering, Mass. Institute of Technology.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
FREDERICK H. DODGE . . 1130 Huron St., Toledo, O.	II.	Secretary of the Toledo White Lime Co.
FRANCIS W. DUNBAR . . . 18 Cortlandt St., New York, N. Y.	VI.	Inspector, American Telephone and Telegraph Co.
PIERRE S. DU PONT . . . Wilmington, Del.	V.	With E. du Pont, De Nemours & Co.
EDWIN F. DWELLEY . . . 25 Baltimore St., Lynn, Mass.	I.	Civil Engineer with Isaac K. Harris, Civil Engineer and Surveyor.
ELWOOD A. EMERY, B. L. . Chicago, Ill.	IV.	With Burnham & Root.
WILLIAM H. FENN . . . 11 E. Franklin St., Baltimore, Md.	I.	Assistant to Engineer of Bridges B. & O. R. R.
WILLIAM P. FLINT . . . Box 714, Cheyenne, Wyo.	II.	Apprentice in the U. P. R. R. Machine Shops.
SAMUEL D. FLOOD . . . . 6 Mullin St., Watertown, N. Y.	II.	Draughtsman, Eames Vacuum Brake Co.
GEORGE W. FULLER . . . West Medway, Mass.	V.	Assistant Biologist, Mass. State Board of Health; Lecturer on Sanitary Biology, Massachusetts Institute of Technology.
GEORGE L. GILMORE . . . Lexington, Mass.	II.	With Gilmore & Haigh, Middlesex Bleaching and Dye Works, Somerville, Mass.
JOHN W. GLIDDEN . . . De Kalb, Ill.	II.	Manager of the De Kalb Roller Mill.
HARRY M. GOODWIN . . Townsend St., Roxbury, Mass.	VIII.	Assistant in Physics, Mass. Institute of Technology.
FRANK M. GREENLAW . . 16 Ashland St., Malden, Mass.	VI.	With Thomson Electric Welding Co., Federal St., Lynn, Mass.
GEORGE E. HALE . . . 4545 Drexel Boulevard, Chicago, Ill.	VIII.	Astronomer, Kenwood Observatory.
JOHN R. HALL . . . . . 249 West Twenty-third St., New York, N. Y.	VI.	With the Metropolitan Telephone & Telegraph Co.
PHILIP M. HAMMETT, A. B. 1015 Chestnut Ave., Altoona, Pa.	II.	In Locomotive Shops, P. R. R. Motive Power Dept.
CHARLES HAYDEN . . . . 166 Newbury St., Boston, Mass.	IX.	
SOPHIA G. HAYDEN . . . Forest Hill and Washington Sts., Jamaica Plain, Mass.	IV.	Teacher of Mechanical Drawing, Eliot School.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
FRANK HAYES . . . . . Milwaukee, Wis.	II.	In the E. P. Allis Reliance Works.
HARRY E. HAYES, A. B. . 3 Columbus Sq., Boston, Mass.	VI.	Assistant in Mechanical Engineering, Mass. Institute of Technology.
SCHUYLER HAZARD . . . Indianapolis, Ind.	I.	Assistant Engineer, Peoria Division, C. C. C. & St. L. Ry.
FREDERICK S. HOLLIS . . Newton Highlands, Mass.	V.	Water Analyst, Boston Water Works.
SIDNEY E. HORTON . . . Windsor Locks, Conn.	II.	With the Dwight Slate Machine Co., Hartford, Conn.
FRANCIS H. KENDALL . . Belmont, Mass.	I.	Assistant in Civil Engineering, Mass. Institute of Technology.
HARRY A. KENNICOTT . . Lincoln, Neb.	I.	Draughtsman, Engineer's Office, B. & M. R. R. R.
FRANKLIN KNIGHT . . . . Lynn, Mass.	I.	Assistant in Civil Engineering, Mass. Institute of Technology.
BERTRAM A. LENFEST . . Wakefield, Mass.	II.	Assistant in Mechanical Engineering, Mass. Institute of Technology.
ERNEST A. LE SUEUR . . Bellows Falls, Vt.	VI.	Russell Paper Company.
BERTRAM H. MANN . . . Swissvale, Pa.	VI.	At the works of the Union Switch and Signal Co.
GEORGE B. MCCONNELL . 153 Blue Hill Ave., Roxbury, Mass.	I.	
GEORGE E. MERRICK . . . Holyoke, Mass.	V.	Chemist for the Merrick Thread Co.
FREDERICK METCALF . . . 20 Exchange Pl., Providence, R. I.	II.	Draughtsman with the Rodney Hunt Machine Co., of Orange, Mass.
BURDETT MOODY . . . . Lead City, S. D.	I.	With the Homestake Mining Company.
STEPHEN W. MOORE . . 133 Hunnewell Ave., Newton, Mass.	II.	Draughtsman for H. H. Cummings & Co., Boston, Mass.
CHARLES NEAVE, B. A. . . Lynn, Mass.	VI.	Electrician.
ALLAN H. NEWELL . . . Washington St. Wharf, San Francisco, Cal.	II.	Stevedore.
NORMAN G. NIMS . . . . 151 Appleton St., Boston, Mass.	IV.	Draughtsman, with Andrews, Jaques & Rantoul, Architects.
ALMON E. NORRIS . . . . Cambridgeport, Mass.	II.	With Edward Kendall & Sons, Machinists and Boiler Makers.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
CLARENCE G. NORRIS . . . 1322 West Jefferson St., Louisville, Ky.	I.	Assistant Engineer on P. C. and St. L. R R., Louisville Division.
HARRY L. NOYES . . . . 55 Buffalo St., Niagara Fall, N. Y.	I.	With the Cataract Construction Company.
JOSEPH K. NOYES . . . . 13 Ferry St., Binghamton, N. Y.	I.	Assistant City Engineer.
GEORGE A. PACKARD . . . South Strafford, Vermont.	III.	Furnace Manager Elizabeth Mining Co.
WILLIAM R. PEYTON . . . 503 W. First St, Duluth, Minn.	II.	
WILLIAM B. POLAND . . . Boston, Mass.	I.	Graduate Student, Mass. Institute of Technology.
EDWARD B. RAYMOND . . Lynn, Mass.	VI.	With the Thomson-Houston Electric Co.
CALVIN W. RICE . . . . Lynn, Mass.	VI.	Experimental Work of the Special Motor Dept., Thomson-Houston Electric Co.
KNIGHT C. RICHMOND, B. P. Stanton House, Chattanooga, Tenn.	II.	Draughtsman with Nier, Hartford & Mitchell.
WILLIAM Z. RIPLEY . . . 618 Centre St., Newton, Mass.	I.	Graduate Student, Mass. Institute of Technology.
HAROLD B. ROBERTS . . . Forest Hill & Washington Sts., Jamaica Plain, Mass.	II.	Graduate Student Mass. Inst. Technology.
EDWARD ROBINSON . . . 243 West Canton St., Boston, Mass.	II.	Assistant in Mechanical Engineering, Mass. Institute of Technology.
ALLEN H. ROGERS . . . . Cliff, Custer Co., Idaho.	III.	Assistant Engineer, Idaho Copper Co.
MINNIE H. ROGERS . . . Pond St., Jamaica Plain, Mass.	IX.	Teacher, Private School.
LOUIS SCHMIDT . . . . . Clifton Heights, Cincinnati, Ohio.	V.	Chemist, with Karl Langenbeck, Chemist.
ADELAIDE SHERMAN . . . 17 Upton St., Boston, Mass.	V.	
CHARLES W. SHERMAN . . Kingston, Mass.	I.	Graduate Student, Mass. Institute of Technology.
EDMUND T. SIMPSON . . . Lowell, Mass.	V.	In business.

NAME AND RESIDENCE.	COURSE.	OCCUPATION.
HOWARD C. SLATER . . . 302 Columbus Ave.,Boston, Mass.	II.	Assistant in Mechanical Engineering, Mass. Institute of Technology.
WILLIAM L. SMITH . . . 360 Marlboro' St., Boston, Mass.	VI.	Assistant in Physics, Mass. Institute of Technology.
GEORGE A. SONNEMANN . Wardner, Idaho.	III.	With Bunker Hill and Sullivan Mining and Concentrating Co.
MARTIN O. SOUTHWORTH . Stoughton, Mass.	VI.	Special Motor Dept., Thomson-Houston Electric Co.
SAMUEL STORROW, A. B. . Box 70, Vancouver, Wash.	I.	With Geo. S. Morrison, Civil Engineer.
BENTON STURGES . . . . Care Dunlap Smith & Co., Corner Dearborn & Monroe Sts., Chicago, Ill.	IX.	Mortgages and Real Estate Investments.
THOMAS J. STURTEVANT . South Framingham, Mass.	VI.	Marine Engineering.
FREDERICK W. SWANTON . 45 Milford St., Boston, Mass.	VI.	Assistant in Physics, Mass. Institute of Technology.
JOHN H. TOWNE . . . . Stamford, Conn.	IX.	With Yale & Towne Mfg. Co.
ELTON D. WALKER . . . 302 Columbus Ave., Boston, Mass.	I.	Assistant in Civil Engineering, Mass. Institute of Technology.
ROBERT T. WALKER . . . 14 Winthrop St., Roxbury, Mass.	IV.	Draughtsman, with Longfellow, Alden & Harlow.
FRANKLIN W. WHITE . . Lawrence Experimental Station, Lawrence, Mass.	VII.	Assistant Bacteriologist, Mass. State Board of Health.
WILLIS R. WHITNEY . . . 41 Union Park, Boston, Mass.	V.	Assistant in General Chemistry, Mass. Institute of Technology.
ARTHUR R. WILSON . . . Oakland, California.	I.	Assistant City Engineer.
ANDREW W. WOODMAN . 87 Walnut St., Chelsea, Mass.	I.	With Boston Bridge Works.

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.

It should be noticed that the graduates comprise but about one fifth of all the students who have in the past been connected with this school.

SUMMARY.

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

Total	759
Deduct names counted twice	2
	757

ALPHABETICAL LIST OF GRADUATES.

NAME.	COURSE.	CLASS.
Abbott, Ira	I.	1881
Aborn, George P.	II.	1886
Adams, Arthur H.	II.	1890
Alden, Charles H., Jr.	IV.	1890
Alden, John	V.	1877
Allbright, 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
Bardwell, Fred L.	V.	1884
Bardwell, Herbert T.	I.	1883
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
Batchelder, John L.	VII.	1890
Batcheller, Birney C.	II.	1886
Bates, Henry D.	IV.	1888
Beach, Edward J.	V.	1889
Beal, Foster E. L.	I.	1871
Beal, J. Williams	IV.	1877
Beasom, Charles B.	II.	1890
Beeching, William H.	II.	1877
Bellows, Arthur B.	II.	1889
Benton, Edward R.	IV.	1885
Bickford, Elizabeth E.	VII.	1890
Bigelow, Henry F.	IV.	1888
Binney, Amos	V.	1881
Bird, Herbert S.	V.	1888
Bissell, David S.	III.	1881
Bixby, Willard G.	II.	1889
Blake, William B.	I.	1887
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
Borden, Charles N.	II.	1889
Boss, Austin D.	II.	1890
Bothfeld, Charles C.	I.	1884
Boyden, Amos J.	IV.	1875
Brace, Walter C.	III.	1887
Bradlee, Arthur T.	II.	1888
Bradley, Frederick W.	VI.	1889
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, William L.	IV.	1886
Braley, Samuel T.	II.	1879
Breed, Joshua B. F.	I.	1876
Brewster, Benjamin E.	III.	1872
Bridges, Luther W.	II.	1889
Briggs, Frank H.	IX.	1881

NAME.	COURSE.	CLASS.
Brotherton, William E.	V.	1873
Brown, Charles H.	I.	1880
Brown, Edward D.	VI.	1890
Brownell, Ernest H.	I.	1890
Bryant, George H.	II.	1883
Bryant, Henry F.	I.	1887
Bulkley, Joseph N.	VI.	1889
Burgess, Frank G.	I.	1887
Burgess, John K.	II.	1886
Burlingham, Charles L.	III.	1886
Burnet, Moses D.	III.	1875
Burnham, Edward C.	II.	1890
Burrison, Henry K.	I.	1875
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, Harry H.	III.	1879
Capen, G. Walter	IV.	1877
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
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, Edwin E.	I.	1880
Chase, Frank D.	III.	1881
Chase, Frank L.	I.	1890
Chase, Harvey S.	II.	1883
Chase, Roscoe L.	V.	1884
Child, Stephen	I.	1888
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
Clifford, Harry E. H.	VI.	1886
Cobb, Louis R.	I.	1886
Cobb, Sylvanus H.	VI.	1888
Cochran, Heywood	II.	1885
Coffin, Fred S.	III.	1879
Colby, Russell H.	V.	1888
Cole, Fred B.	II.	1888
Cole, Winthrop	II.	1887
Collins, Benjamin G.	II.	1881
Collins, Bertrand R. T.	II.	1888
Collins, Edward, Jr.	VI.	1888
Collins, William H.	V.	1890
Conant, Henry J.	II.	1887
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 G.	I.	1890
Cromwell, Charles H.	II.	1889
Crosby, William O.	VII.	1876
Cross, Charles R.	Sci. and Lit.	1870
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
Dame, Frank L.	VI.	1889
Dan, Takuma	III.	1878
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 Lancey, Darragh	II.	1890
Delano, Alexander J.	I.	1890
Dennett, Clarence L.	II.	1876
Devens, Richard	II.	1888
De Wolf, John O.	II.	1890
Dewson, Edward H., Jr.	II.	1885
Doane, Alfred O.	III.	1884
Doane, George E.	I.	1874
Dodge, Charles B.	IX.	1889
Dodge, Frederick H.	II.	1890
Dodge, Frank S.	I.	1875
Dodge, William B.	I.	1872

NAME.	COURSE.	CLASS.
Doe, Charles C.	VII.	1886
Doolittle, Orrin S.	V.	1886
Dorr, Edgar S.	I.	1875
Dowse, William B.	IV.	1874
Duff, James C.	V.	1886
Duff, John	V.	1881
Dunbar, Francis W.	VI.	1890
Dunbar, W. Otis	II.	1879
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
Ellsworth, Alfred B.	I.	1888
Ely, Edward F.	IV.	1882
Emerson, Joseph S.	I.	1874
Emery, Elwood A.	IV.	1890
Emmerton, Frederic A.	V.	1872
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
Felton, Samuel M., Jr.	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, 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
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
Freeman, John R.	I.	1876
French, Alfred W.	I.	1889
French, Charles A.	III.	1882
French, Edward V.	II.	1889
French, George L. R.	I.	1884
French, Hollis	VI.	1889
Frost, Howard V.	V.	1882
Fry, Thomas W.	II.	1885
Fukuzawa, Stejiro	I.	1888
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
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
Gay, Joseph B.	IV.	1887
Gay, Martin	I.	1877
Gerrish, William H.	II.	1888
Gilbert, James P.	V.	1889
Gill, Augustus H.	V.	1884
Gilman, Charles C.	III.	1868
Gilmore, Geo. L.	II.	1890
Gleason, Walter H.	V.	1887
Glidden, John W.	II.	1890
Goddard, David S.	III.	1881
Goodale, Charles W.	III.	1875
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
Greene, Charles E.	I.	1868
Greene, Irving G.	I.	1888
Greenlaw, Frank M.	VI.	1890
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

NAME.	COURSE.	CLASS.
Hall, Albert F.	II.	1868
Hall, Francis P.	V.	1882
Hall, John R.	VI.	1890
Hamblet, George W.	II.	1888
Hamilton, George W.	I.	1880
Hammatt, Edward A. W.	I.	1875
Hammett, Philip M.	II.	1890
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, William L.	VII.	1888
Hartwell, Ernest G.	IV.	1879
Harvey, George L.	II.	1888
Hastings, Charles F.	III.	1888
Hathaway, D. Lewis K.	II.	1886
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
Heywood, George H.	III.	1884
Hibbard, Henry D.	III.	1877
Hibbard, Thomas	II.	1875
Higgins, Alfred S.	IV.	1878
Higgins, Edward E.	VI.	1886
Hildreth, William O.	II.	1887
Hinman, Charles W.	III.	1870
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.	1876
Holton, Edward C.	V.	1888
Homer, Eleazer B.	IV.	1885
Hongma, Aechirau	I.	1874
Hooker, Richard	IV.	1889
Hopkins, Frederick L.	V.	1889
Hopkins, William J.	VI.	1886
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
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
Ingalls, Walter R.	III.	1886
Jackson, Frank H.	III.	1874
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, Lewis E.	II.	1889
Johnson, William S.	I.	1889
Jones, Arthur W.	VI.	1888
Jones, Edward A.	II.	1887
Jordan, Edwin O.	VII.	1888
Jordan, William F.	I.	1886
Kebler, Julian A.	I.	1878
Kendall, Charles B.	V.	1887
Kendall, Francis H.	I.	1890
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, 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
Koehler, Walter J.	V.	1881

NAME.	COURSE.	CLASS.
Kunhardt, Lewis H.	II.	1889
Lane, Fred H.	II.	1879
Lauder, George B.	VI.	1889
Lawrence, John A. McC.	II.	1886
Laws, Frank A.	VI.	1889
Lawton, Charles F.	I.	1877
Leach, Albert E.	II.	1886
Lee, George S.	I.	1888
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
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
Lund, Amy Stantial	V.	1884
Lund, James	V.	1881
Lyle, David A.	III.	1884
Lynde, James P.	IX.	1886
Lyon, Tracy	II.	1885
Macfarlane, William W.	V.	1879
MacRae, Hugh	III.	1885
Main, Charles T.	II.	1876
Mann, Arthur S.	II.	1888
Mann, Bertram H.	VI.	1890
Manning, Harry G.	II.	1882
Mansfield, George W.	III.	1882
Mansfield, Harvey M.	III.	1883
Martin, Henry	V.	1885
Mason, Sampson D.	I.	1870
May, William C.	V.	1873
McConnell, George B.	I.	1890
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, N. Frederick	V.	1870
Metcalf, Arthur H.	II.	1879
Metcalf, Frederick	II.	1890
Mildram, Samuel H.	I.	1889
Millen, Loring R.	III.	1880
Miller, Edward F.	II.	1886
Miller, Edwin C.	II.	1879
Miller, William T.	Elective.	1880
Mills, Arthur L.	I.	1876
Minot, Charles S.	V.	1872
Mixter, Samuel J.	VIII.	1875
Moody, Burdett	I.	1890
Moore, Frank A.	IV.	1888
Moore, Harry C.	II.	1888
Moore, Stephen W.	II.	1890
Morgan, Frank H.	V.	1878
Morrison, Frank C.	I.	1882
Morse, Frank B.	I.	1873
Morse, Philip S.	III.	1884
Morss, Everett	III.	1885
Mosman, Philip A.	III.	1887
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
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
Noyes, Arthur A.	V.	1886
Noyes, Harry L.	I.	1890
Noyes, Joseph K.	I.	1890
Nute, Joseph E.	I.	1885
O'Grady, Marcella I.	IX.	1885
Ordway, Evelyn W.	V.	1881
Owen, Edward H., Jr.	II.	1879
Oxnard, Benjamin A.	III.	1875

NAME.	COURSE.	CLASS.
Packard, George A.	III.	1890
Parker, Theodore	I.	1881
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, Herbert B.	I.	1874
Peters, Quintard	IX.	1887
Peterson, Charles A.	VI.	1888
Peyton, William R.	II.	1890
Phillipps, George	III.	1873
Phillips, Henry A.	IV.	1873
Phipps, David W.	Phil.	1876
Pickering, William H.	VIII.	1879
Pickernell, Frank A.	VI.	1885
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
Power, Charles W.	VI.	1889
Pratt, George H.	V.	1871
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
Randall, Newbert M.	III.	1885
Ranno, Fred W.	I.	1889
Ray, John	II.	1888
Raymond, Edward B.	VI.	1890
Reynolds, George F.	II.	1886
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
Richmond, Knight C.	II.	1890
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
Robinson, C. Snelling	III.	1884
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
Ross, Henry F.	III.	1882
Ross, John H.	Elective.	1882
Rotch, A. Lawrence	II.	1884
Rounds, George W.	VI.	1889
Russel, Richard L.	I.	1889
Russell, L. Kimball	V.	1886
Ryder, Josiah P.	V.	1884
Sabine, Annie W.	VIII.	1888
Safford, Frederick H.	VI.	1888
Sanborn, Frank E.	II.	1889
Sargent, Francis T.	II.	1875
Sargent, Welland F.	I.	1875
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
Shailer, Robert A.	I.	1873
Shaw, Edward S.	I.	1874
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
Sherman, Adelaide	V.	1890

NAME.	COURSE.	CLASS.
Sherman, Charles W.	I.	1890
Shockley, William H.	III.	1875
Sillsbee, Francis H.	II.	1874
Simpson, Edmund T.	V.	1890
Simpson, James E.	III.	1886
Sjöström, Ivar L.	I.	1888
Slater, Howard C.	II.	1890
Small, Nathaniel C.	V.	1880
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
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, Hollon C.	II.	1887
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
Stickney, Delia	V.	1889
Stimpson, Thomas F.	III.	1877
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
Swanton, Frederick W.	VI.	1890
Sweetland, Ralph	II.	1889
Sweetser, Arthur W.	I.	1874
Taintor, Giles	VI.	1887
Talbot, Henry P.	V.	1885
Talbot, Marion	IX.	1888
Taney, Edmund	I.	1878
Taylor, William M.	II.	1886
Tenney, Frank	III.	1883
Thomas, Edward G.	II.	1887
Thompson, Frederick	I.	1887
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
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, Harry W.	V.	1884
Underhill, William W.	II.	1889
Underwood, George R.	V.	1883
Van Alstine, David	II.	1886
Vanier, George P.	III.	1885
Very, Frank W.	V.	1873
Vielé, Maurice A.	II.	1886
Vorce, Clarence B.	I.	1888
Vose, Ralph	VI.	1887
Waite, Charles N.	V.	1876
Waitt, Arthur M.	II.	1879
Waitt, Henry M.	I.	1876
Walker, Elton D.	I.	1890
Walker, Robert T.	IV.	1890

NAME.	COURSE.	CLASS.
Ward, Clarence S.	III.	1872
Ward, Nahum	V.	1884
Ware, Robert C.	Sci. and Lit.	1874
Warner, Charles H.	VI.	1889
Warren, A. Sydney	III.	1888
Warren, Edward R.	VII.	1881
Warren, H. L. J.	III.	1875
Webster, Edwin S.	VI.	1888
Webster, William R.	III.	1875
Weeks, Isaiah S. P.	I.	1871
Weil, Charles L.	II.	1888
Wells, Webster	I.	1873
Wesson, David	V.	1883
Whipple, George C.	I.	1889
Whitaker, Channing	II.	1869
White, Anthony C.	VIII.	1882
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
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
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
Windett, Victor	II.	1889
Winslow, Arthur	III.	1881
Wood, Charles	I.	1886
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, 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, MAY, 1890.

ARTHUR HENRY ADAMS,

An Experimental Investigation of the Slip of Leather Belts on Cast-iron Pulleys. (*With S. D. Flood.*)

CHARLES HENRY ALDEN, JR.,

A Design for the Plumbing System of a City House.

FRANK WILEY ATWOOD,

Oil of Maize.

ARTHUR WHITTIER AYER,

An Experimental Study of the Effect of Kiln-drying on the Transverse Strength of Spruce.

CYRUS CATES BABB,

A Discussion of the Topography of Schoharie, N. Y., and of Camden, Me.

JOSEPH BLACK BAKER,

Experiments on Commercial Storage Batteries. (*With T. J. Sturtevant.*)

HIRAM ELLSWORTH BALDWIN,

Design for a Three-hinged Arch.

SPAULDING BARTLETT,

An Investigation of Several Methods for Setting Indigo Vats.

JOHN LANGDON BATCHELDER, JR.,

A Sanitary Bacteriological Study of the Milk Supply of Boston.

CHARLES BOARDMAN BEASOM,

Design for a Compound Engine.

ELIZABETH EMMA BICKFORD,

A Study of the Zoögloea Stage of Bacteria.

JOHN BALCH BLOOD,

The Efficiency of Alternating Current Transformers. (*With W. L. Smith and F. W. Swanton.*)

AUSTIN DUNHAM BOSS,
A Design for a Thread Mill. (*With E. F. Bragg.*)

EDWARD FRANKLIN BRAGG,
A Design for a Thread Mill. (*With A. D. Boss.*)

LOTTIE ALMIRA BRAGG,
Distribution of Nitrogen and Phosphorus in the Products of Modern Milling.

EDWARD DEXTER BROWN,
An Experimental Study of the Waste Field of Dynamos. (*With F. M. Greenlaw.*)

ERNEST HENRY BROWNELL, A. B.,
A Study of the Flow of Water in the Proposed Cape Cod Ship Canal.

EDWARD CLIFTON BURNHAM, A. B.,
Tests on the Lift and Discharge of a Safety-valve.

GARY NATHAN CALKINS,
Supreme Court Cases Affecting the Principle of Sovereignty, from 1791 to 1833.

MORTEN CARLISLE,
The Effect of Projecting Teeth in Ring Armatures. (*With J. Clark, Jr.*)

CHESTER VERNON CARLTON,
A Discussion of Various Forms of Easement or Transition Curves.

JAMES ANDREW CARNEY,
A Study of Brom- and Nitroso-Phenols.

GEORGE DANIEL CHAPMAN,
A Design for an Automatic Rack-Cutter, including some Tests on Milling Cutters.

FRANK LINTEN CHASE,
A Discussion of Column Formulas.

JAMES CLARK, JR.,
The Effect of Projecting Teeth in Ring Armatures. (*With M. Carlisle.*)

WILLIAM HENRY COLLINS,
Nature of the Union between Benzidine Colors and Cellulose.

WALTER FREEMAN COOK,
A Comparison of Retail Prices in Boston and Vicinity.

JOHN GOODING CRANE,
Design for a Lock Gate for a Ship Canal.

DARRAGH DE LANCEY,
The Design, Construction, and Testing of a Torsion Dynamometer. (*With K. C. Richmond.*)

ALEXANDER JAMES DELANO,

A Study of Wooden and Metal Railroad Ties.

JOHN OVIATT DE WOLF,

A Theoretical and Experimental Study of the Deflection of Locomotive Parallel-Rods.

FREDERICK HOLMES DODGE,

Some Experiments to Determine the Effect of Repeated Bending on Wrought Iron and Steel.

FRANCIS WILLIAM DUNBAR,

An Experimental Investigation of the Various Electrical Methods of Testing Shunt Motors. (*With M. O. Southworth.*)

PIERRE SAMUEL DU PONT,

Determination of Silicon in Commercial Aluminum.

EDWIN FORREST DWELLEY,

A Project for a Railroad to Connect the Village of Brant Rock, Mass., with the Old Colony Railroad. (*With C. G. Norris.*)

ELWOOD ALLEN EMERY, B. L.,

Design for a College of Music.

WILLIAM HENRY FENN,

A Discussion of the Application of Movable Dams to the Rivers of the United States.

WILLIAM PARKER FLINT,

A Study of the Balancing of the Drivers of the Eight-Wheel Locomotive by Means of Counterweights.

SAMUEL DOUGLAS FLOOD,

An Experimental Investigation of the Slip of Leather Belts on Cast-iron Pulleys. (*With A. H. Adams.*)

GEORGE WARREN FULLER,

The Determination of Organic Nitrogen in Well Waters.

GEORGE L. GILMORE,

An Investigation of the Temperature of the Gases in the Tubes of a Horizontal Multitubular Boiler.

JOHN WILLARD GLIDDEN,

Experiments on Explosive Mixtures.

HARRY MANLY GOODWIN,

Some Experimental Researches in Acoustics.

FRANK MURRAY GREENLAW,

An Experimental Study of the Waste Field of Dynamos. (*With E. D. Brown.*)

GEORGE ELLERY HALE,
Photography of the Solar Prominences.

JOHN RICHARDSON HALL,
Efficiency Test of a Thomson-Houston Arc Lighting Dynamo. (*With E. B. Raymond.*)

PHILIP MELANCTHON HAMMETT, A. B.,
An Experimental Investigation of the Flow of Steam through an Orifice.

CHARLES HAYDEN,
An Historical and Statistical Study of Taxation in Massachusetts.

SOPHIA GREGORIA HAYDEN,
Design for a Museum of Fine Arts.

FRANK HAYES,
A Design of the Reciprocating Parts and Valve Motions of a Special Form of Compound Engine.

HARRY EDGAR HAYES, A. B.,
The Influence of the Strength of the Core on the Action of the Magneto Telephone Transmitter and Receiver.

SCHUYLER HAZARD,
A Project for Carrying Congress Street over the Tracks of the New York and New England Railroad at South Boston. (*With F. H. Kendall.*)

FREDERICK STEARNS HOLLIS,
The Action of Alumina on Ammonia in Natural Waters.

SIDNEY ELLSWORTH HORTON,
Experiments on the Efficiency of Steam-Pipe Coverings.

FRANCIS HOWE KENDALL,
Project for Carrying Congress Street over the Tracks of the New York and New England Railroad at South Boston. (*With S. Hazard.*)

HARRY ADAMS KENNICOTT,
A Comparison of Various Sewer Cross-Sections with Respect to Velocity and Discharge.

FRANKLIN KNIGHT,
A Project for Abolishing the Grade Crossing at Bridge Street, Northampton, Mass. (*With W. Z. Ripley.*)

BERTRAM AUGUSTUS LENFEST,
Experiments on Surface Condensation. (*With S. W. Moore.*)

H. WARD LEONARD,
Modern Methods of Distributing and Utilizing Electric Energy, with Special Reference to Mining Work.

ERNEST ARTHUR LE SUEUR,
An Investigation of the Manner of Decomposition in a Certain Class of Electrolytic Cells.

BERTRAM HASKELL MANN,

The Insulation Resistance of the Rail Circuits in Railroad Block-Signals.

GEORGE BANCROFT MCCONNELL,

Water-Waste: Its Cause, Detection, and Prevention.

GEORGE EDWARD MERRICK,

Experiments on the Electrolysis of a Solution of Common Salt, together with some Experiments on the Effect of the Base on the Bleaching Efficiency of Certain Hypochlorites.

FREDERICK METCALF,

Strength and Elasticity of Fine Worsted Wool Fibres.

BURDETT MOODY,

A Study of Bridge Floors.

STEPHEN WALLACE MOORE,

Experiments on Surface Condensation. (*With B. A. Lenfest.*)

CHARLES NEAVE, B. A.,

Efficiency of Induction Coils used in Telephony.

ALLAN HOVEY NEWELL,

Experimental Determination of the Modulus of Elasticity of the Skin of Cast-iron Beams.

NORMAN GRANVILLE NIMS,

Design for a Chamber of Commerce and Exchange.

ALMON EVANS NORRIS,

Design for an Automatic Tandem Compound Engine.

CLARENCE GEORGE NORRIS,

A Project for a Railroad to connect the Village of Brant Rock, Mass., with the Old Colony Railroad. (*With E. F. Dwelley.*)

HARRY LINCOLN NOYES,

Brakes for Railway Trains; with a Discussion of the Value of the Westinghouse Freight Brake to the Boston and Albany Railroad.

JOSEPH KARR NOYES,

A Review of the Plans of a Deck Plate Girder Bridge over the Chenango River, at Binghamton, N. Y.

GEORGE ARTHUR PACKARD,

The Extraction of Silver from Argentiferous Blende, and from Chloride and Sulphide of Silver.

WILLIAM ROWZEE PEYTON,

Strength of Western White Pine.

WILLIAM BABCOCK POLAND,

An Investigation into the Causes of Failure of Dams.

EDWARD BRACKETT RAYMOND,

Efficiency Test of a Thomson-Houston Arc Lighting Dynamo. (*With J. R. Hall.*)

CALVIN WINSOR RICE,

Tests of Commercial Registering Current Meters.

KNIGHT CHENEY RICHMOND, B. P.,

The Design, Construction, and Testing of a Torsion Dynamometer. (*With Darragh de Lancey.*)

WILLIAM ZEBINA RIPLEY,

A Project for Abolishing the Grade Crossing at Main Street, Northampton, Mass. (*With F. Knight.*)

HAROLD BARNES ROBERTS,

Investigation of the Valve Gears of the Triple Expansion Engine in the Mechanical Engineering Laboratory.

EDWARD ROBINSON,

Experiments on an Otto Gas Engine. (*With H. C. Slater.*)

ALLEN HASTINGS ROGERS,

Concentration of Copper in Calumet & Hecla By-Products.

MINNIE HEMPEL ROGERS,

A Study in International Law: The Doctrine of Non-Intervention as Exemplified in the History of the United States.

LOUIS SCHMIDT,

The Examination of a Crude Petroleum from Texas.

ADELAIDE SHERMAN,

The Action of Nitrous Acid on Para-bromaniline.

CHARLES WINSLOW SHERMAN,

A Discussion of the Distribution of the Velocity of Water Flowing in Pipes and in Jets.

EDMUND THOMAS SIMPSON,

Experiments on the Rate of Formation of the Mono-Sulphonic Acids of the Aromatic Series.

HOWARD COLFAX SLATER,

Experiments on an Otto Gas Engine. (*With Edward Robinson.*)

WILLIAM LINCOLN SMITH,

The Efficiency of Alternating Current Transformers. (*With J. B. Blood and F. W. Swanton.*)

GEORGE ADOLPH SONNEMANN,

Pan Amalgamation of a Manganiferous Silver Ore.

MARTIN OTIS SOUTHWORTH,

An Experimental Investigation of the Various Electrical Methods of Testing Shunt Motors. (*With F. W. Dunbar.*)

SAMUEL STORROW, A. B.,

A Design for a Cantilever Highway Bridge.

BENTON STURGES,

Dissensions in the Churches of the United States, caused by Anti-Slavery Agitation, as illustrated especially in the Presbyterian and Methodist Episcopal Denominations.

THOMAS JOSEPH STURTEVANT,

Experiments on Commercial Storage Batteries. (*With J. B. Baker.*)

FREDERICK WORCESTER SWANTON,

The Efficiency of Alternating Current Transformers. (*With J. B. Blood and W. L. Smith.*)

JOHN HENRY TOWNE,

The Basis of Compensation of Labor.

ELTON DAVID WALKER,

A Design of a Profile for a Masonry Dam, with a Discussion of the Relative Merits of Curved and Straight Dams.

ROBERT TURNER WALKER,

A Design for a Cathedral and Clergy House, with Approaches.

FRANKLIN WARREN WHITE,

An Investigation of the Effects of Electricity upon Micro-organisms.

WILLIS RODNEY WHITNEY,

A Study of Methods for the Determination of Nitrates in Natural Waters.

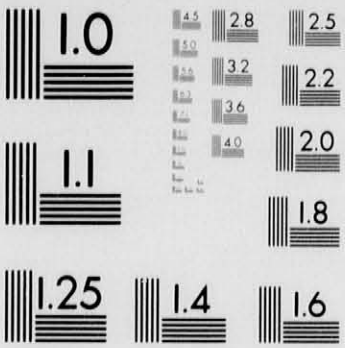
ARTHUR ROBERTS WILSON,

A Discussion of Experiments on the Flow of Water through Hose and Nozzles, and on the Height of Jets.

ANDREW WHITNEY WOODMAN,

A Study of the Methods of Connecting Floor Beams to Trusses.

Alphabetical Index.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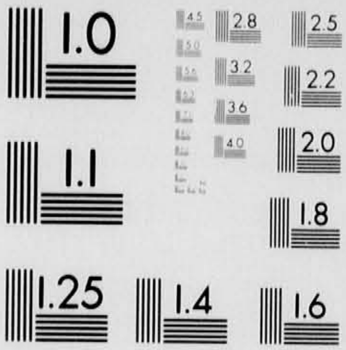
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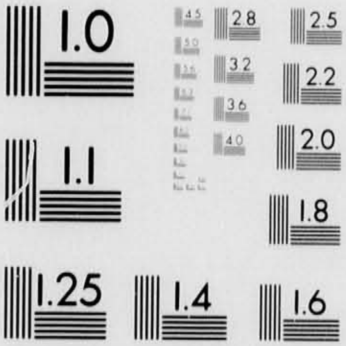
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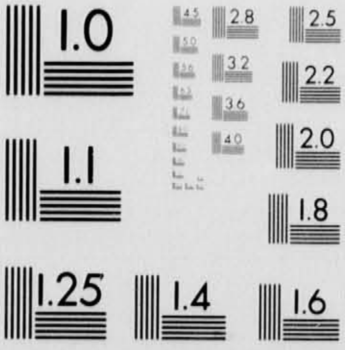
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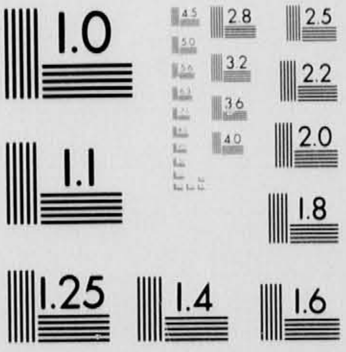
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