

M. I. T. ANNUAL CATALOGUES AND BULLETINS

1896/97

01 OF 04

DONATED BY  
J. S. GUTRO  
DECEMBER 29, 1920

MASSACHUSETTS  
INSTITUTE OF TECHNOLOGY.  
BOSTON.



WITHDRAWN FROM  
CALIF. ACQUIS. 1921.

ANNUAL CATALOGUE.

1896-1897.

PUBLICATIONS  
OF  
THE MASSACHUSETTS INSTITUTE  
OF TECHNOLOGY.

---

**ANNUAL CATALOGUE**, issued in December, containing lists of Officers and Students; a full statement of the Courses of Instruction, a register of the Graduates with their professional positions, and an account of the Lowell School of Design.

**PROGRAMME**, identical with the Catalogue, but not containing the Schedule of Topics, the Registers of Students and of Graduates.

**SPECIAL DESCRIPTIVE CIRCULARS.**

**MASSACHUSETTS INSTITUTE OF TECHNOLOGY**: an illustrated pamphlet giving a general account of the laboratories and equipment.

Circulars on the Departments of *Civil Engineering; Mechanical Engineering; Mining Engineering; Physics and Electrical Engineering; Architecture; Chemistry and Chemical Engineering; Biology; General Studies; Naval Architecture.*

Circulars on *Opportunities for Teachers; Opportunities for College Graduates; Requirements for the Degree of Master of Science; The Lowell School of Design; Summer Courses.*

*Register of Scientific Periodicals* on file in the libraries of the Institute.

Any of the above publications will be sent free upon application to

H. W. TYLER, *Secretary.*  
491 *Boylston Street, Boston, Mass.*

---

**THE TECHNOLOGY QUARTERLY AND PROCEEDINGS OF  
THE SOCIETY OF ARTS.**

PUBLISHED BY THE SOCIETY OF ARTS.

Containing the results of scientific investigations in the different departments of the Institute, and the principal papers read before the Society of Arts. Subscription price, \$3.00 per annum. Address,

**TECHNOLOGY QUARTERLY,**  
*Massachusetts Institute of Technology.*

MASSACHUSETTS  
INSTITUTE OF TECHNOLOGY.  
BOSTON.

---

THIRTY-SECOND  
ANNUAL CATALOGUE

OF THE

Officers and Students,

WITH

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

1896 - 1897.

JOHN WILSON AND SON.

University Press, Cambridge.

1897.

CALENDAR FOR 1896-97.

School Year began . . . . .	Wednesday, Sept. 30, 1896.
Semi-annual Examinations begin . . . . .	Tuesday, Jan. 19, 1897.
Second Term begins . . . . .	Tuesday, Feb. 9, 1897.
Annual Examinations begin . . . . .	Tuesday, May 25, 1897.
Degrees conferred. — School Year ends . . . . .	Tuesday, June 8, 1897.
First Entrance Examinations . . . . .	{ Thursday, July 1, 1897, and
	{ Friday, July 2, 1897.
Examinations for Advanced Standing begin . . . . .	Friday, Sept. 17, 1897.
Second Entrance Examinations <sup>1</sup> . . . . .	{ Tuesday, Sept. 21, 1897, and
	{ Wednesday, Sept. 22, 1897.
School Year of 1897-98 begins . . . . .	Wednesday, Sept. 29, 1897.

CALENDAR FOR 1897-98.

School Year begins . . . . .	Wednesday, Sept. 29, 1897.
Semi-annual Examinations begin . . . . .	Tuesday, Jan. 18, 1898.
Second Term begins . . . . .	Tuesday, Feb. 8, 1898.
Annual Examinations begin . . . . .	Tuesday, May 24, 1898.
Degrees conferred. — School Year ends . . . . .	Tuesday, June 7, 1898.
First Entrance Examinations . . . . .	{ Thursday, June 30, 1898, and
	{ Friday, July 1, 1898.
Examinations for Advanced Standing begin . . . . .	Friday, Sept. 16, 1898.
Second Entrance Examinations <sup>1</sup> . . . . .	{ Tuesday, Sept. 20, 1898, and
	{ Wednesday, Sept. 21, 1898.
School Year of 1898-99 begins . . . . .	Wednesday, Sept. 28, 1898.

---

Stated Meetings of the Corporation . . . . .	{ Oct. 14 and Dec. 9, 1896.
	{ March 10 and June 4, 1897.
Stated Meetings of the Executive } Committee of the Corporation }	{ First and third Tuesdays of every month.

<sup>1</sup> See page 59.

## TABLE OF CONTENTS.

---

	PAGE
CALENDAR . . . . .	2, 146
ALPHABETICAL INDEX . . . . .	305

---

### MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

HISTORICAL SKETCH . . . . .	7
LOCATION AND EQUIPMENT . . . . .	9
MEMBERS OF THE CORPORATION . . . . .	11
EXECUTIVE AND VISITING COMMITTEES . . . . .	12
ADMINISTRATIVE OFFICERS . . . . .	15
OFFICERS OF INSTRUCTION . . . . .	15
FACULTY . . . . .	23
COURSES OF INSTRUCTION:	
<i>Regular Courses</i> : General Statement . . . . .	24
Statements and Schedules of Studies . . . . .	27
Five-year Regular Courses . . . . .	54
Graduate Courses . . . . .	54
<i>Special Students</i> . . . . .	56
<i>Summer Courses</i> . . . . .	57
REQUIREMENTS FOR ADMISSION:	
<i>Times of Examinations</i> : For Admission to 1st Year . . . . .	59
For Advanced Standing . . . . .	60
<i>Requirements</i> : Regular Courses, 1st Year . . . . .	60
Regular Courses, 2d, 3d, and 4th Years . . . . .	68
Special Students . . . . .	69
Divided Examinations . . . . .	66
REQUIREMENTS FOR GRADUATION . . . . .	70
SUBJECTS AND METHODS OF INSTRUCTION:	
Mathematics . . . . .	71
Drawing and Descriptive Geometry . . . . .	72
Chemistry . . . . .	73
The Kidder Laboratories of Chemistry . . . . .	76

	PAGE
SUBJECTS AND METHODS OF INSTRUCTION ( <i>continued</i> ).	
Physics . . . . .	77
The Rogers Laboratory of Physics . . . . .	78
Theoretical and Applied Mechanics . . . . .	80
Civil Engineering . . . . .	81
Mechanical Engineering . . . . .	85
Naval Architecture . . . . .	87
Electrical Engineering . . . . .	89
Chemical Engineering . . . . .	92
The Engineering Laboratories . . . . .	93
Shopwork . . . . .	96
Mining Engineering and Metallurgy . . . . .	97
The John Cummings Laboratory of Mining and Metallurgy . . . . .	97
Architecture . . . . .	101
Biology . . . . .	103
The Biological Laboratory . . . . .	105
Mineralogy . . . . .	106
Physical Geography and Geology . . . . .	106
The Geological Laboratory . . . . .	108
Modern Languages . . . . .	109
English . . . . .	110
History and Political Science . . . . .	111
Economics . . . . .	112
Military Science and Tactics . . . . .	114
Libraries . . . . .	115
SCHEDULE OF TOPICS . . . . .	116
REGULATIONS OF THE SCHOOL:	
School Year . . . . .	146
Calendar . . . . .	146
Status of Students . . . . .	146
Examinations . . . . .	147
Attendance Card . . . . .	148
Bond or Deposit . . . . .	148
Fees . . . . .	148
Scholarships . . . . .	149
Fellowships . . . . .	151
Residence and Expenses . . . . .	152
Attendance . . . . .	152
Conduct . . . . .	152
REGISTER OF STUDENTS:	
Graduate Students . . . . .	154
Regular Students . . . . .	158

CONTENTS.

5

PAGE

REGISTER OF STUDENTS ( <i>continued</i> ).	
Special Students . . . . .	178
Summary . . . . .	191
LOWELL FREE COURSES OF INSTRUCTION:	
Objects and Scope . . . . .	192
Conditions of Attendance . . . . .	192
Subjects for 1896-1897 . . . . .	193
LOWELL FREE SCHOOL OF PRACTICAL DESIGN:	
Brief Account of the School . . . . .	195
Course of Study . . . . .	195
Requirements for Admission . . . . .	196
Regulations of the School . . . . .	196
Register of Students . . . . .	197
ASSOCIATIONS OF THE ALUMNI . . . . .	199
GRADUATES AND THEIR OCCUPATIONS:	
Register by Classes . . . . .	201
Alphabetical Register . . . . .	278
Titles of Theses of Class of 1896 . . . . .	291



# Massachusetts Institute of Technology.

---

## HISTORICAL SKETCH.

The foundation of the Massachusetts Institute of Technology was laid in a "Memorial" prepared in 1859 by Professor William Barton Rogers, and presented, by a Committee, to the Legislature of 1860. In this Memorial, "reference is made to the expected early establishment of a comprehensive Polytechnic College, furnishing a complete system of industrial education supplementary to the general training of other institutions, and fitted to equip its students with every scientific and technical principle applicable to the industrial pursuits of the age."

On May 28, 1860, a sub-committee, consisting of Professor Rogers and Messrs. E. B. Bigelow and J. M. Beebe, was appointed to "mature a plan for a polytechnic institution." To this sub-committee Messrs. M. D. Ross and C. H. Dalton were subsequently added, and for it Professor Rogers, during the summer of 1860, prepared an elaborate report entitled, "OBJECTS AND PLAN OF AN INSTITUTE OF TECHNOLOGY; including a Society of Arts, a Museum of Arts, and a School of Industrial Science, proposed to be established in Boston. . . . Addressed to manufacturers, merchants, mechanics, agriculturists, and other friends of enlightened industry in the Commonwealth." This report was printed and widely distributed.

On January 11, 1861, a public meeting of persons interested in the proposed Institution was held in Mercantile Hall, and a preliminary organization effected. Professor

Rogers was Chairman of this meeting, and John D. Runkle, Secretary. On April 10, 1861, the MASSACHUSETTS INSTITUTE OF TECHNOLOGY was incorporated by the Legislature, and a grant of the "new land" in the Back Bay was made, subject to certain conditions. The first meeting of the Institute for organization was held April 8, 1862. The civil war led to the postponement of the opening of the School of Industrial Science until 1865; but the Society of Arts was organized, began its meetings on December 17, 1862, and has maintained them ever since. A preliminary session of the School of Industrial Science was opened, fifteen students attending, on February 20, 1865. The regular courses of instruction began October 2, 1865.

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

A subsidiary school, known as the **LOWELL SCHOOL OF PRACTICAL DESIGN**, is maintained by the Corporation of the Institute. A statement of its scope and organization will be found on page 195.

**The Society of Arts** aims to awaken and maintain an interest in the practical applications of the sciences and to aid in their advancement. Meetings are held semi-monthly from October to May, at which, reports of inventions, discoveries, and matters of scientific and technical interest are presented. The "Technology Quarterly," including the proceedings of the Society and papers pre-

sented at its meetings, is regularly published. All communications concerning the Society should be addressed to the Secretary of the Society of Arts, Massachusetts Institute of Technology.

### LOCATION AND EQUIPMENT.

THE buildings of the Institute are not only favorably located for accessibility and convenience of students and instructors, but are in close proximity to the chief collections and libraries of Boston, in particular to the Museum of Fine Arts, the new Public Library, and the Museum of the Boston Society of Natural History. The free lecture courses of the Lowell Institute are held in the main building of the school. Several railroad stations and many street-car lines afford convenient access from the southern and western suburbs. Moreover, the advantages of location in a great manufacturing district, with which the school maintains close relations, are of the greatest value to technological students. Frequent short excursions enable them to make immediate connection between what they learn in the school and what they observe in the industrial establishments. The relations between principles and their applications are much better enforced than if the latter were reserved for vacation or some subsequent period. The architectural student, for example, not only has at his hand conspicuous examples of the best design and construction, but regularly receives suggestive criticism from men eminent in professional practice. To the student in economics and political science the various state and city institutions afford ample opportunities for individual investigation.

**Buildings.**—The buildings now occupied are the Rogers Building, on Boylston Street, devoted to instruction in mathematics, literature, history, political science, geology, mineralogy, and biology; the Walker Building, at the corner of Boylston and Clarendon streets, mainly devoted to the departments of chemistry, physics, and electricity, and to

instruction in language; the Engineering Building, on Trinity Place, devoted to the engineering laboratories and to instruction in mechanics and hydraulics, and in mechanical and civil engineering; the Architectural Building, immediately adjoining the Engineering Building; a series of Workshops, on Garrison Street, with a room devoted to the Lowell School of Design; and a Gymnasium and Drill-hall, on Exeter Street.

**Equipment.** — The foundation of all sound technological education requires not only thorough theoretical training, but also prolonged, well-directed laboratory drill which shall first give the student the power of close and accurate observation, and then bring him into direct contact with the material problems of his future profession.

The laboratories of the Institute are numerous and extensive; their equipment is correspondingly ample and is kept well up to the rapid advances in technical practice. Provision is made, not only for general exact training in the problems of physics and chemistry, but also, on the one hand, for highly specialized work in these and other sciences, on the other, for engineering tests and processes on a practical scale. Descriptions of the different laboratories and some account of their equipment, as well as of the libraries of the Institute, will be found on pages 71 to 115.

## Members of the Corporation.

---

### President.

FRANCIS A. WALKER.

### Secretary.<sup>1</sup>

FRANCIS H. WILLIAMS.

### Treasurer.

GEORGE WIGGLESWORTH.

JOHN D. RUNKLE.  
FREDERIC W. LINCOLN.  
WILLIAM ENDICOTT, JR.  
JOHN CUMMINGS.  
AUGUSTUS LOWELL.  
HOWARD A. CARSON.  
CHARLES J. PAINE.  
CHARLES FAIRCHILD.  
DAVID R. WHITNEY.  
LEWIS WM. TAPPAN, JR.  
HENRY D. HYDE.  
ALEXANDER S. WHEELER.  
JAMES P. TOLMAN.  
HOWARD STOCKTON.  
ELIOT C. CLARKE.  
NATHANIEL THAYER.  
CHARLES F. CHOATE.  
HENRY L. PIERCE.  
HIRAM F. MILLS.  
PERCIVAL LOWELL.

ARTHUR T. LYMAN.  
CHARLES MERRIAM.  
THORNTON K. LOTHROP.  
CHARLES C. JACKSON.  
SAMUEL M. FELTON.  
DESMOND FITZGERALD.  
SAMUEL CABOT.  
FRANCIS BLAKE.  
CHARLES W. HUBBARD.  
JAMES M. CRAFTS.  
THOMAS L. LIVERMORE.  
A. LAWRENCE ROTCH.  
WILLIAM H. FORBES.  
JOHN R. FREEMAN.  
GEORGE A. GARDNER.  
WILLIAM H. LINCOLN.  
J. B. SEWALL.  
THOMAS GAFFIELD.  
CHARLES L. LOVERING.  
A. LAWRENCE LOWELL.

### On the Part of the Commonwealth.

HIS EXCELLENCY GOV. ROGER WOLCOTT.

HON. WALBRIDGE A. FIELD, *Chief Justice of the Supreme Court.*

HON. FRANK A. HILL, *Secretary of the Board of Education.*

<sup>1</sup> Communications should be addressed to the Secretary of the Institute.  
(See page 15.)

## Committees of the Corporation.

---

### Executive Committee.

FRANCIS A. WALKER. } *Ex Officiis.*  
GEORGE WIGGLESWORTH. }  
JOHN CUMMINGS.            THOMAS L. LIVERMORE.  
FRANCIS H. WILLIAMS.      AUGUSTUS LOWELL.  
ALEXANDER S. WHEELER.

---

### Finance Committee.

WILLIAM ENDICOTT, JR.      CHARLES C. JACKSON.  
DAVID R. WHITNEY.          NATHANIEL THAYER.  
WILLIAM H. FORBES.

---

### Committee on the Society of Arts.

HOWARD A. CARSON.          GEORGE A. GARDNER.  
HIRAM F. MILLS.

---

### Committee on the Lowell School of Industrial Design.

PERCIVAL LOWELL.            JOHN D. RUNKLE.  
WILLIAM H. LINCOLN.

---

### Auditing Committee.

CHARLES C. JACKSON.          JAMES P. TOLMAN.  
CHARLES FAIRCHILD.

---

### Committee on Nominations.

AUGUSTUS LOWELL.            FREDERIC W. LINCOLN.  
HOWARD STOCKTON.          DAVID R. WHITNEY.  
GEORGE A. GARDNER.

---

### Trustees of the Museum of Fine Arts.

FREDERIC W. LINCOLN.      FRANCIS A. WALKER.  
A. LAWRENCE ROTCH.

## Visiting Committees.

---

### Department of Civil Engineering.

HOWARD A. CARSON.	ELIOT C. CLARKE.
CHARLES F. CHOATE.	DESMOND FITZGERALD.
JOHN R. FREEMAN.	

### Departments of Mechanical Engineering and Applied Mechanics.

HIRAM F. MILLS.	FRANCIS BLAKE.
DESMOND FITZGERALD.	JAMES P. TOLMAN.

### Department of Mining and Geology.

THOMAS L. LIVERMORE.	JAMES P. TOLMAN.
CHARLES FAIRCHILD.	CHARLES L. LOVERING.

### Department of Architecture.

THORNTON K. LOTHROP.	JOHN R. FREEMAN.
ELIOT C. CLARKE.	A. LAWRENCE ROTCH.

### Department of Physics and Electrical Engineering.

FRANCIS BLAKE.	CHARLES W. HUBBARD.
A. LAWRENCE ROTCH.	

### Departments of Literature, History, and Political Economy.

FRANK A. HILL.	CHARLES C. JACKSON.
J. B. SEWALL.	A. LAWRENCE LOWELL.

### Department of Modern Languages.

J. B. SEWALL.	NATHANIEL THAYER.
FRANK A. HILL.	THORNTON K. LOTHROP.

### Department of Mathematics.

PERCIVAL LOWELL.	HOWARD A. CARSON.
HOWARD STOCKTON.	DESMOND FITZGERALD.

### Departments of Chemistry and Biology.

SAMUEL CABOT.	JAMES M. CRAFTS.
THOMAS GAFFIELD.	

### Department of Chemical Engineering.

ARTHUR T. LYMAN.	SAMUEL CABOT.
HIRAM F. MILLS.	CHARLES W. HUBBARD.

### Department of Naval Architecture.

CHARLES J. PAINE.	WILLIAM H. FORBES.
HOWARD STOCKTON.	WILLIAM H. LINCOLN.

## Administrative Officers.

---

<i>President</i> . . . . .	FRANCIS A. WALKER.
<i>Treasurer</i> . . . . .	GEORGE WIGGLESWORTH.
<i>Secretary</i> . . . . .	HARRY W. TYLER.
<i>Librarian</i> . . . . .	ROBERT P. BIGELOW.
<i>Bursar</i> . . . . .	ALBERT M. KNIGHT.

---

## Officers of Instruction.

- FRANCIS A. WALKER, PH.D., LL.D.,  
*President.*
- JOHN D. RUNKLE, PH.D., LL.D.,  
*Walker Professor of Mathematics.*
- GEORGE A. OSBORNE, S.B.,  
*Professor of Mathematics.*
- JAMES M. CRAFTS, S.B.,  
*Professor of Organic Chemistry.*
- ROBERT H. RICHARDS, S.B.,  
*Professor of Mining Engineering and Metallurgy.*
- WILLIAM H. NILES, PH.B., A.M.,  
*Professor of Geology and Geography.*
- CHARLES R. CROSS, S.B.,  
*Thayer Professor of Physics; Director of the Rogers Laboratory.*
- GAETANO LANZA, C.E.,  
*Professor of Theoretical and Applied Mechanics; in charge of the Department of Mechanical Engineering.*
- GEORGE F. SWAIN, S.B.,  
*Hayward Professor of Civil Engineering.*
- FRANCIS W. CHANDLER,  
*Professor of Architecture.*
- ALPHONSE N. VAN DAELL, LL.D.,  
*Professor of Modern Languages.*



- WILLIAM T. SEDGWICK, Ph.D.,  
*Professor of Biology.*
- DAVIS R. DEWEY, Ph.D.,  
*Professor of Economics and Statistics.*
- SILAS W. HOLMAN, S.B.,  
*Professor of Physics.*
- WEBSTER WELLS, S.B.,  
*Professor of Mathematics.*
- CECIL H. PEABODY, S.B.,  
*Professor of Marine Engineering and Naval Architecture.*
- HARRY W. TYLER, Ph.D.,  
*Professor of Mathematics.*
- ARLO BATES, A.M., Litt. D.,  
*Professor of English.*
- JOHN BIGELOW, JR., CAPT. U.S. ARMY.  
*Professor of Military Science and Tactics.*
- DESIRÉ DESPRADELLE,  
*Professor of Architectural Design.*
- PETER SCHWAMB, S.B.,  
*Professor of Mechanism ; Director of the Workshops.*
- C. FRANK ALLEN, S.B.,  
*Professor of Railroad Engineering.*
- ALFRED E. BURTON, S.B.,  
*Professor of Topographical Engineering.*
- DWIGHT PORTER, Ph.B.,  
*Professor of Hydraulic Engineering.*
- HEINRICH O. HOFMAN, E.M., Ph.D.,  
*Associate Professor of Mining and Metallurgy.*
- THOMAS E. POPE, A.M.,  
*Associate Professor of General Chemistry.*
- ELEAZER B. HOMER, S.B.,  
*Associate Professor of Architecture.*
- GEORGE T. DIPPOLD, Ph.D.,  
*Associate Professor of Modern Languages.*
- HENRY P. TALBOT, Ph.D.,  
*Associate Professor of Analytical Chemistry.*
- CHARLES F. A. CURRIER, A.M.,  
*Associate Professor of History.*
- LINUS FAUNCE, S.B.,  
*Associate Professor of Drawing.*
- WILLIAM O. CROSBY, S.B.,  
*Assistant Professor of Structural and Economic Geology.*

- JEROME SONDERICKER, C.E.,  
*Assistant Professor of Applied Mechanics.*
- ALLYNE L. MERRILL, S.B.,  
*Assistant Professor of Mechanism.*
- DANA P. BARTLETT, S.B.,  
*Assistant Professor of Mathematics.*
- EDWARD F. MILLER, S.B.,  
*Assistant Professor of Steam Engineering.*
- FRANK VOGEL, A.M.,  
*Assistant Professor of Modern Languages.*
- WILLIAM L. PUFFER, S.B.,  
*Assistant Professor of Electrical Engineering.*
- FREDERICK H. BAILEY, A.M.,  
*Assistant Professor of Mathematics.*
- FRED L. BARDWELL, S.B.,  
*Assistant Professor of General Chemistry.*
- AUGUSTUS H. GILL, Ph.D.,  
*Assistant Professor of Gas Analysis.*
- ARTHUR A. NOYES, Ph.D.,  
*Assistant Professor of Organic Chemistry.*
- S. HOMER WOODBRIDGE, A.M.,  
*Assistant Professor of Heating and Ventilation.*
- HARRY E. CLIFFORD, S.B.,  
*Assistant Professor of Theoretical Physics.*
- RICHARD W. LODGE,  
*Assistant Professor of Mining and Metallurgy.*
- FREDERICK S. WOODS, Ph.D.,  
*Assistant Professor of Mathematics.*
- THEODORE HOUGH, Ph.D.,  
*Assistant Professor of Biology.*
- WILLIAM Z. RIPLEY, Ph.D.,  
*Assistant Professor of Sociology and Economics.*
- JOSEPH J. SKINNER, Ph.D.,  
*Assistant Professor of Mathematics.*
- GEORGE H. BARTON, S.B.,  
*Assistant Professor of Geology.*
- ARTHUR G. ROBBINS, S.B.,  
*Assistant Professor of Highway Engineering.*
- WILLIAM H. LAWRENCE, S.B.,  
*Assistant Professor of Architecture.*
- HENRY K. BURRISON, S.B.,  
*Instructor in Mechanical Drawing.*

- ELLEN H. RICHARDS, A.M., S.B.,  
*Instructor in Sanitary Chemistry.*
- CHARLES L. ADAMS,  
*Instructor in Freehand Drawing.*
- PETER S. BURNS, Ph.D.,  
*Instructor in General Chemistry.*
- JOHN W. SMITH,  
*Instructor in Industrial Chemistry and Textile Coloring.*
- GEORGE W. HAMBLET, S.B.,  
*Instructor in Mechanical Engineering.*
- FRANK A. LAWS, S.B.,  
*Instructor in Electrical Measurements.*
- NATHAN R. GEORGE, JR., A.M.,  
*Instructor in Mathematics.*
- HARRY M. GOODWIN, Ph.D.,  
*Instructor in Physics.*
- WILLIAM LINCOLN SMITH, S.B.,  
*Instructor in Electrical Engineering.*
- LEONARD M. PASSANO, A.B.,  
*Instructor in Mathematics.*
- CHARLES H. L. N. BERNARD,  
*Instructor in Modern Languages.*
- JOSEPH BLACHSTEIN,  
*Instructor in Modern Languages.*
- WILLIS R. WHITNEY, Ph.D.,  
*Instructor in Sanitary Chemistry.*
- CARLETON A. READ, S.B.,  
*Instructor in Mechanical Engineering.*
- JAMES SWAN, S.B. (*Absent*),  
*Instructor in Naval Architecture.*
- G. RUSSELL LINCOLN, S.B.,  
*Instructor in Sanitary Chemistry.*
- LOUIS DERR, M.A., S.B.,  
*Instructor in Physics.*
- GEORGE V. WENDELL, S.B. (*Absent*),  
*Instructor in Physics.*
- LÉON E. BERNARD,  
*Instructor in Modern Languages.*
- ROBERT P. BIGELOW, Ph.D.,  
*Instructor in Biology; Librarian of the Institute.*
- BENJAMIN E. CARTER, JR., A.M.,  
*Instructor in Mathematics.*
- HENRY G. PEARSON, A.B.,  
*Instructor in English.*

- FRANK H. THORP, Ph.D.,  
*Instructor in Industrial Chemistry.*
- CHARLES E. FULLER, S.B.,  
*Instructor in Mechanical Engineering.*
- WILLIAM A. JOHNSTON, S.B.,  
*Instructor in Mechanical Engineering.*
- CHARLES F. PARK, S.B.,  
*Instructor in Mechanical Engineering.*
- JOHN O. SUMNER, A.B.,  
*Instructor in History.*
- WILLIAM H. WALKER, Ph.D.,  
*Instructor in Analytical Chemistry.*
- SAMUEL P. MULLIKEN, Ph.D.,  
*Instructor in Organic Chemistry.*
- GEORGE W. ROLFE, A.M.,  
*Instructor in Analytical Chemistry.*
- L. KIMBALL RUSSELL, S.B.,  
*Instructor in General Chemistry.*
- ERVIN KENISON, S.B.,  
*Instructor in Mechanical Drawing and Descriptive Geometry.*
- CHARLES L. NORTON, S.B.,  
*Instructor in Physics.*
- KILBURN S. SWEET, S.B.,  
*Instructor in Civil Engineering.*
- F. JEWETT MOORE, Ph.D.,  
*Instructor in Analytical Chemistry.*
- W. FELTON BROWN,  
*Instructor in Freehand Drawing.*
- FREDERICK H. KEYES, S.B.,  
*Instructor in Mechanical Engineering.*
- JUSTUS ERHARDT,  
*Instructor in Modern Languages.*
- HENRY FAY, Ph.D.,  
*Instructor in Analytical Chemistry.*
- HARRY W. GARDNER, S.B.,  
*Instructor in Architecture.*
- GEORGE B. HAVEN, S.B.,  
*Instructor in Mechanical Engineering.*
- FRANK P. MCKIBBEN, S.B.,  
*Instructor in Civil Engineering.*
- JOSEPH W. PHELAN, S.B.,  
*Instructor in General Chemistry.*
- ALEXANDER W. MOSELEY, S.B.,  
*Instructor in Mechanical Engineering.*

- WILLIAM J. DRISKO, S.B.,  
*Instructor in Physics.*
- JAMES F. NORRIS, PH.D.,  
*Instructor in Organic Chemistry.*
- SAMUEL C. PRESCOTT, S.B.,  
*Instructor in Biology.*
- ARCHER T. ROBINSON,  
*Instructor in English.*
- ARTHUR W. WEYSSE, PH.D.,  
*Instructor in Biology.*
- FRANKLIN H. ROBBINS, S.B.,  
*Assistant in Mechanical Drawing.*
- JESSE H. BOURNE, S.B.,  
*Assistant in Mechanical Engineering.*
- CARL H. CLARK, S.B.,  
*Assistant in Naval Architecture.*
- FREDERICK A. HANNAH, S.B.,  
*Assistant in Mechanical Engineering.*
- FREDERIC W. HOWE, B.S.,  
*Assistant in General Chemistry.*
- CHARLES R. WALKER, S.B.,  
*Assistant in General Chemistry.*
- FRANK B. MASTERS, S.B.,  
*Assistant in Mechanical Engineering.*
- CHARLES M. SPOFFORD, S.B.,  
*Assistant in Civil Engineering.*
- REUBEN E. BAKENHUS, S.B.,  
*Assistant in Civil Engineering.*
- EDWARD M. BRAGG, S.B.,  
*Assistant in Mechanical Engineering.*
- GEORGE K. BURGESS, S.B.,  
*Assistant in Physics.*
- WILLIAM D. COOLIDGE, S.B.,  
*Assistant in Physics.*
- LEONARD H. GOODHUE, S.B.,  
*Assistant in Analytical Chemistry.*
- AMADEUS W. GRABAU, S.B.,  
*Assistant in Geology.*
- HARRISON W. HAYWARD, S.B.,  
*Assistant in Industrial Chemistry.*
- MINOR S. JAMESON, S.B.,  
*Assistant in Civil Engineering.*
- RALPH R. LAWRENCE, S.B.,  
*Assistant in Physics.*

- CLARENCE W. PERLEY, S.B.,  
*Assistant in Biology.*  
WILLIAM L. ROOT, S.B.,  
*Assistant in Oil and Gas Analysis.*  
HAROLD C. STEVENS, S.B.,  
*Assistant in Civil Engineering.*  
ALBERT J. WELLS, S.B.,  
*Assistant in Mechanical Drawing.*

## INSTRUCTORS AND ASSISTANTS IN THE MECHANIC ARTS.

- THEODORE B. MERRICK,  
*Instructor in Woodwork and Foundry-work.*  
JAMES R. LAMBIRTH,  
*Instructor in Forging.*  
ROBERT H. SMITH,  
*Instructor in Machine-Tool Work.*  
MINOT A. BRIDGHAM,  
*Assistant in Woodwork.*  
EVERETT H. MASTERS,  
*Assistant in Forging.*  
IRA G. STUDLEY,  
*Assistant in Machine-Tool Work.*

## INSTRUCTOR IN GYMNASTICS.

- HERMAN BOOS.

## TEACHERS AND LECTURERS FOR THE CURRENT YEAR.

- TRUMAN H. BARTLETT, *on Modelling.*  
LOUIS BELL, Ph.D., *on the Electrical Transmission and Utilization of Power.*  
GEORGE W. BLODGETT, S.B., *on the Applications of Electricity to Railway Signalling.*  
HENRY CARMICHAEL, Ph.D., *on Electrolysis of Brine.*  
WILLIAM R. COPELAND, A.B., *on Bacteriology of Water and Sewage Purification.*  
HOWARD C. FORBES, S.B., *on Commercial Electrical Testing.*  
JOHN R. FREEMAN, S.B., *on the Hydraulics of Fire Protection, and on Fireproof Construction.*  
HOLLIS FRENCH, S.B., *on Electrical Engineering Practice and Specifications.*  
DAVID A. GREGG, *on Pen and Ink Drawing.*  
HAMMOND V. HAYES, Ph.D., *on Telephone Engineering.*  
ERNEST F. HENDERSON, Ph.D., *on German History.*  
HENRY M. HOWE, A.M., S.B., *on Metallurgy.*  
DANIEL D. JACKSON, S.B., *on the Microscopical Examination of Water Supplies.*  
CHARLES D. JENKINS, S.B., *on Illuminating Gas, and on Pottery and Tiles.*  
SIMEON C. KEITH, JR., S.B., *on Industrial Biology.*  
ERNEST A. LE SUEUR, S.B., *on the Industrial Applications of Electro-Chemistry.*  
ARTHUR D. LITTLE, *on Paper.*  
JAMES W. LOVELAND, S.B., *on Manufacture of Soaps.*  
SAMUEL W. MEAD, *on Architectural Design.*  
WALTER S. MOODY, *on Transformers.*  
ODIN B. ROBERTS, S.B., A.M., LL.B., *on the Nature and Function of Patents for Inventions.*  
LOUIS J. SCHILLER, *on Sugar and Sugar Refining.*  
FRANK G. STANTIAL, S.B., *on Sulphuric Acid.*  
ELIHU THOMSON, *on Recent Developments in Applied Electricity.*  
ROSS TURNER, *on Water Color.*  
C. HOWARD WALKER, *on the History of Ornament.*

---

N. B.—For additional occasional lectures on special subjects, see pages 83 to 90.

## Faculty.

---

FRANCIS A. WALKER, *President.*

JOHN D. RUNKLE.	ELEAZER B. HOMER.
GEORGE A. OSBORNE.	GEORGE T. DIPPOLD.
JAMES M. CRAFTS.	HENRY P. TALBOT.
ROBERT H. RICHARDS.	CHARLES F. A. CURRIER.
WILLIAM H. NILES.	LINUS FAUNCE.
CHARLES R. CROSS.	WILLIAM O. CROSBY.
GAETANO LANZA.	JEROME SONDERICKER.
GEORGE F. SWAIN.	ALLYNE L. MERRILL.
FRANCIS W. CHANDLER.	DANA P. BARTLETT.
ALPHONSE N. VAN DAELL.	EDWARD F. MILLER.
WILLIAM T. SEDGWICK.	FRANK VOGEL.
DAVIS R. DEWEY.	WILLIAM L. PUFFER.
SILAS W. HOLMAN.	FREDERICK H. BAILEY.
WEBSTER WELLS.	FRED L. BARDWELL.
CECIL H. PEABODY.	AUGUSTUS H. GILL.
HARRY W. TYLER, <i>Secretary.</i>	ARTHUR A. NOYES.
ARLO BATES.	S. HOMER WOODBRIDGE.
JOHN BIGELOW, JR.	HARRY E. CLIFFORD.
D. DESPRADELLE.	RICHARD W. LODGE.
PETER SCHWAMB.	FREDERICK S. WOODS.
C. FRANK ALLEN.	THEODORE HOUGH.
ALFRED E. BURTON.	WILLIAM Z. RIPLEY.
DWIGHT PORTER.	JOSEPH J. SKINNER.
HEINRICH O. HOFMAN.	GEORGE H. BARTON.
THOMAS E. POPE.	ARTHUR G. ROBBINS.
	WILLIAM H. LAWRENCE.



## Courses of Instruction.

---

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

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

These subjects have been arranged in thirteen distinct "Courses," each of four years' duration. For the satisfactory completion of any one of these, the degree of Bachelor of Science is conferred by the Institute. Of the thirteen courses, eight give their students scientific and practical training for the various engineering professions; four others, namely, those in Chemistry, Physics, Biology, and Geology, with a larger

proportion of pure science, afford preparation either for professional practice, for teaching, or for scientific investigation. The Course in General Studies combines thorough general scientific training with a wide range of philosophic studies. While the Institute of Technology is primarily and essentially a school of applied science, its curriculum has always comprised a certain, not inconsiderable, amount of literary, historical, and economic study. There has been no time since the foundation of the Institute when its degree could be attained without studies in these lines carried through at least three years.

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

**Schedules and Descriptions of the Professional Courses.** — The following pages 27 to 53 contain schedules showing the distribution of studies throughout each of the regular courses. Each schedule is preceded by a brief description.

**Choice of Courses.**<sup>1</sup> At the end of the first half-year, which is the same for all courses, the student selects, subject to the approval of the Faculty, the course which he will thenceforth pursue, and his work becomes more specialized thereafter as it progresses.

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 27 to 53), the statements made in regard to the various branches of study (for example, Mathematics, Language, Chemistry, Physics, etc.) in the paragraphs descriptive of the "Subjects and Methods of Instruction," pages 71 to 115.

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

<sup>1</sup> A special circular in regard to the choice of courses will be sent on application.

selection of the branch of his intended profession to which he will specially devote his energies in the later years of his study. Thus in Civil Engineering, page 29, he may elect sanitary and hydraulic engineering, geodesy, or an advanced course in railroad engineering and management; in Mechanical Engineering, page 31, he may choose either marine engineering, locomotive construction, or mill engineering; and similarly for other courses. Inspection of the course descriptions and schedules, pages 27 to 53, will show the nature and effect of the options. In cases where numbers are prefixed, the selection of later options is positively determined by that of earlier ones, owing to the requirement of certain subjects as preparation for the former; in others, a wide choice is offered throughout all the years, the difference in this respect arising largely from the nature of the topics involved.

**Graduate Courses** of study may be pursued, either with or without reference to advanced degrees, by graduates of the Institute or by other persons of equivalent training. (See page 54.)

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

**Subjects and Methods of Instruction.** — The statements on pages 71 to 115 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.

## SCHEDULES OF FIRST-YEAR STUDIES IN THE REGULAR COURSES.

### FIRST TERM.

(Common to all Courses.)

Algebra, or Solid Geometry . . . . . 20, 21	Freehand Drawing . . . . . 80
Plane Trigonometry . . . . . 22	French <sup>1</sup> (or German <sup>2</sup> ) . . . . . 151-(161)
General Chemistry; Chemical Laboratory . . . . . 240	Rhetoric and English Composition . . . . . 120
Mechanical Drawing . . . . . 70	Military Tactics.

### SECOND TERM.

COURSES I., II., III. (2), VI., X., XI., XIII.	Freehand Drawing . . . . . 82
Plane Trigonometry . . . . . 22	French <sup>1</sup> (or German <sup>2</sup> ) . . . . . 151-(161)
Analytic Geometry . . . . . 27	French <sup>1</sup> sight-reading . . . . . 152
General Chemistry; Qualitative Analysis; Chemical Laboratory . . . . . 241	United States History . . . . . 180
Mechanical Drawing and Descriptive Geometry . . . . . 71, 72	Military Tactics.
Freehand Drawing . . . . . 81	
French <sup>1</sup> (or German <sup>2</sup> ) . . . . . 151-(161)	
United States History . . . . . 180	
Military Tactics.	

#### COURSES III. (1), V., VIII., XII.

Plane Trigonometry . . . . . 22	
Analytic Geometry <sup>3</sup> . . . . . 27	
General Chemistry; Qualitative Analysis; Chemical Laboratory . . . . . 241	
Mechanical Drawing . . . . . 74	
Freehand Drawing . . . . . 81	
French <sup>1</sup> (or German <sup>2</sup> ) . . . . . 151-(161)	
United States History . . . . . 180	
Military Tactics.	

#### COURSE IV.

Plane Trigonometry . . . . . 22	
Analytic Geometry . . . . . 27	
Mechanical Drawing and Descriptive Geometry . . . . . 71, 73	

#### COURSE VII.

Plane Trigonometry; Elements of Plane Analytic Geometry . . . . . 22, 23	
General Chemistry; Qualitative Analysis; Chemical Laboratory . . . . . 241	
Microscopy . . . . . 603	
Mechanical Drawing . . . . . 75	
Freehand Drawing . . . . . 81	
French <sup>1</sup> (or German <sup>2</sup> ) . . . . . 151-(161)	
United States History . . . . . 180	
Military Tactics.	

#### COURSE IX.

Plane Trigonometry; Elements of Analytic Geometry . . . . . 22, 23	
Mechanical Drawing; Chart and Map Making . . . . . 75	
Freehand Drawing . . . . . 81	
United States History . . . . . 180	
Logic and Argumentative Composition . . . . . 121	
French <sup>1</sup> (or German <sup>2</sup> ) . . . . . 151-(161)	
French <sup>1</sup> sight-reading . . . . . 152	
Military Tactics.	

For descriptions of the methods, etc., used in the above instruction, see the corresponding pages under Subjects and Methods of Instruction, pages 71 to 115. Numbers at the right refer to the first column of the Schedule of Topics (pages 116-145), where details are given as to the methods of instruction, etc.

<sup>1</sup> Students entering on French take German in their second and third years.

<sup>2</sup> Students entering on German take French in their second and third years.

<sup>3</sup> For V. (option 2) and XII., briefer course, 23.

### I.—CIVIL ENGINEERING.

This course is designed to give the student 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 use of engineering instruments and with the usual problems of practice.

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

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

In the summer vacation following the third year, four weeks are devoted to a course of field-work in geodesy, topography, hydraulics, and geology, open to all students, and required of those taking the geodetic option. (See pages 81 to 85.)

**I.—CIVIL ENGINEERING.**

FIRST YEAR. SEE PAGE 27.

**SECOND YEAR.**

FIRST TERM.	SECOND TERM.
Surveying and Plotting . . . . . 360	Surveying and Plotting . . . . . 360
Topographical Drawing . . . . . 362	Mechanism . . . . . 430
Elements of Astronomy . . . . . 363	Physical Geography . . . . . 560
Differential Calculus; Spherical Trigonometry . . . . . 29	Integral Calculus . . . . . 32
Physics: Mechanics, Wave Motion, Electricity (lectures) . . . . . 300	Physics: Electricity, Optics (lectures) . . . . . 300
Descriptive Geometry . . . . . 78	German (or French) . . . . . 160 (150)
German (or French) . . . . . 160 (150)	English Literature and Composition . . . . . 125
English Literature . . . . . 125	
European History . . . . . 181	

**THIRD YEAR.**

FIRST TERM.	SECOND TERM.
R. R. and Highway Engineering; Field-work and Drawing 372, 373, 374	R. R. and Highway Engineering; Field-work and Drawing 372, 373, 374
Advanced Surveying . . . . . 370	Advanced Surveying . . . . . 370
Stereotomy . . . . . 375	Theory of Structures . . . . . 376
Structural Geology . . . . . 505	Stratigraphic Geology . . . . . 508
Physics: Heat . . . . . 310	Physical Laboratory . . . . . 311
Physical Laboratory . . . . . 311	Strength of Materials; Theory of Elasticity . . . . . 50
General Statics; Stresses in Frames; Strength of Materials . . . . . 50	German (or French) . . . . . 161 (151)
German (or French) . . . . . 161 (151)	Political Economy and Industrial History . . . . . 205
Political Economy . . . . . 205	Business Law . . . . . 235
Business Law . . . . . 235	

**FOURTH YEAR.**

FIRST TERM.	SECOND TERM.
Theory of Structures: Bridges and similar Structures 394, 397 (or 396)	Theory of Structures: Bridges and similar Structures 394, 397 (or 396)
Hydraulics . . . . . 390	Thesis.
Industrial Electricity <sup>1</sup> . . . . . 316	<i>Options.</i>
Strength of Materials; Theory of Elasticity <sup>2</sup> . . . . . 56	{ Hydraulic Engineering . . . . . 401
Elements of Dynamo Machinery <sup>2</sup> . . . . . 340	{ Elements of Geodesy . . . . . 407
<i>Options.</i>	{ Bridge & Sanitary Design 398, 404
{ Sanitary and Hydraulic Eng. . . . . 392	{ Foundations <sup>1</sup> . . . . . 409
{ Bridge Design . . . . . 398	1. { Sanitary Science and the Public Health . . . . . 629
{ Hydraulic Measurements . . . . . 393	{ Machinery and Motors <sup>2</sup> . . . . . 60
1. { Practical Astronomy . . . . . 385	{ Steam Engineering <sup>1</sup> . . . . . 459
{ Steam Engineering <sup>1</sup> . . . . . 459	{ Engineering Laboratory . . . . . 402
{ Metallurgy of Iron . . . . . 487	{ Railroad and Highway Engineering . . . . . 385
{ R. R. & Highway Eng. . . . . 335, 385	{ Bridge & Railroad Design 398, 403
{ Railroad Design . . . . . 403	{ Building Construction . . . . . 540
{ Railroad Management . . . . . 386	2. { Foundations <sup>1</sup> . . . . . 409
2. { Bridge Design . . . . . 398	{ Machinery and Motors <sup>2</sup> . . . . . 60
{ Steam Engineering <sup>1</sup> . . . . . 459	{ Steam Engineering <sup>1</sup> . . . . . 459
{ Metallurgy of Iron . . . . . 487	{ Engineering Laboratory . . . . . 402
{ Bridge Design . . . . . 390	{ Hydraulic Engineering . . . . . 401
3. { Geodesy and Astronomy . . . . . 387, 388	{ Geodesy . . . . . 387
{ Hydraulic Measurements . . . . . 393	3. { Differential Equations . . . . . 43
{ Method of Least Squares . . . . . 42	{ Physical Laboratory . . . . . 325
{ Physical Laboratory . . . . . 325	

<sup>1</sup> For classes entering after 1893.

<sup>2</sup> For classes entering before 1894.

## II. — MECHANICAL ENGINEERING.

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

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

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

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

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

Engineering laboratory work. This begins with drill in steam-engine tests in the second term of the third year, and is continued throughout the fourth year, including tests of boilers, pumps, power, etc., and a large amount of investigation. (See pages 85 and 93.)

## II.—MECHANICAL ENGINEERING.

FIRST YEAR. SEE PAGE 27.

## SECOND YEAR.

FIRST TERM.	SECOND TERM.
Principles of Mechanism . . . . . 420	Mechanism: Gear-Teeth; Machine Tools; Cotton Machinery . . . . . 427
Drawing . . . . . 422	Drawing . . . . . 423
Carpentry and Wood-turning . . . . . 98	Pattern Work . . . . . 99
Differential Calculus . . . . . 29	Foundry (elective) . . . . . 108
Physics: Mechanics, Wave Motion, Electricity (lectures) . . . . . 300	Integral Calculus . . . . . 32
Descriptive Geometry . . . . . 78	Physics: Electricity, Optics (lectures) . . . . . 300
German (or French) . . . . . 160 (150)	German (or French) . . . . . 160 (150)
English Literature . . . . . 125	English Literature and Composition . . . . . 125
European History . . . . . 181	

## THIRD YEAR.

FIRST TERM.	SECOND TERM.
Steam Engineering; Valve Gears; Thermodynamics . . . . . 433	Steam Engineering; Boilers . . . . . 433
Drawing . . . . . 438	Drawing, Design, and use of Surveying Instruments . . . . . 438, 371
Electricity . . . . . 316, 317	Engineering Laboratory . . . . . 443
Forging . . . . . 100	Forging; Chipping and Filing . . . . . 100, 102
Elements of Differential Equations . . . . . 36	Physical Laboratory . . . . . 311
Physics: Heat . . . . . 310	Strength of Materials; Kinematics and Dynamics . . . . . 52
Physical Laboratory . . . . . 311	German (or French) . . . . . 161 (151)
General Statics . . . . . 51	Political Economy and Industrial History . . . . . 205
German (or French) . . . . . 161 (151)	Business Law . . . . . 235
Political Economy . . . . . 205	
Business Law . . . . . 235	

## FOURTH YEAR.

FIRST TERM.	SECOND TERM.
Steam Engineering . . . . . 450	Hydraulic Motors . . . . . 400
Machine Design . . . . . 453	Engineering Laboratory . . . . . 455
Hydraulics . . . . . 391	Machine-Tool Work . . . . . 104
Dynamics of Machines . . . . . 451	Strength and Stability of Structures; Theory of Elasticity . . . . . 59
Engineering Laboratory . . . . . 455	Foundations <sup>1</sup> . . . . . 465
Chipping and Filing; Machine-Tool Work . . . . . 103, 104	Shop Management <sup>1</sup> . . . . . 466
Strength of Materials; Friction . . . . . 57	Political Economy and Industrial History <sup>2</sup> . . . . . 203
Heating and Ventilation . . . . . 338	Thesis.
Elements of Dynamo Machinery <sup>2</sup> . . . . . 340	
Metallurgy of Iron . . . . . 487	
<i>Options.</i>	<i>Options.</i>
1. Marine Engineering . . . . . 461	1. Marine Engineering . . . . . 461
2. Locomotive Construction . . . . . 460	2. Locomotive Construction . . . . . 460
3. Mill Engineering . . . . . 462	3. Mill Engineering . . . . . 462

<sup>1</sup> For classes entering since 1893.<sup>2</sup> For classes entering before 1894.



### III.—MINING ENGINEERING AND METALLURGY.

The mining and metallurgical engineer has of necessity demands made upon him in a great variety of lines. The policy of the school is to give him the underlying principles of mathematics, physics, chemistry, mineralogy, geology, mining engineering, and metallurgy, as well as some practical knowledge of mechanical, civil, and electrical engineering. Thus equipped, he can after graduation take up specialized work, with the expectation of carrying it on successfully.

The first option is such a general course, adapted to the needs of students who prefer not to make an immediate choice between professional specialties. Students who have not a serious reason for doing otherwise are advised to take this option.

The second option is arranged with reference to mechanism and the steam engine, the time necessary being taken from surveying, geology, and mining engineering. This course is adapted especially for the iron and steel metallurgist.

In each option, valuable opportunities are offered for observation and field-work in the summer schools of mining and metallurgy, and in mineralogical excursions, as well as in the ample laboratories of the Institute. (See pages 97 to 101.)

For students able to devote an additional year to the course, valuable collateral instruction in other engineering branches, or a combination of the two options, may be arranged. In view of the exceedingly varied demands likely to be made upon the professional mining engineer, such an extension of the course offers particular advantages.

III.—MINING ENGINEERING AND METALLURGY.

FIRST YEAR. SEE PAGE 27.

SECOND YEAR.

FIRST TERM.		SECOND TERM.	
Theoretical Chemistry . . . . .	245	Mineralogy and Blowpipe Analysis . . . . .	561, 562
Differential Calculus . . . . .	29	Integral Calculus . . . . .	32
Physics: Mechanics, Wave Motion, Electricity (lectures) . . . . .	300	Physics: Electricity, Optics (lectures) . . . . .	300
German (or French) . . . . .	160 (150)	German (or French) . . . . .	160 (150)
English Literature . . . . .	125	English Literature and Composition	125
European History . . . . .	181		
<i>Options.</i>		<i>Options.</i>	
1. { Surveying and Plotting . . . . .	360	1. { Surveying and Plotting . . . . .	360
{ Topographical Drawing . . . . .	362	{ Physical Geography . . . . .	560
{ Blowpipe Silver Assay . . . . .	480	{ Mechanism: Gear-Teeth; Machine Tools . . . . .	428
2. { Descriptive Geometry . . . . .	78	2. { Drawing . . . . .	424
{ Principles of Mechanism . . . . .	420		
{ Blowpipe Silver Assay (elective)	480		

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

THIRD YEAR.

FIRST TERM.		SECOND TERM.	
Assaying . . . . .	482	Quantitative Analysis (lectures and laboratory) . . . . .	260
Qualitative Analysis (lectures and laboratory) . . . . .	251	Physical Laboratory . . . . .	313
Physics: Heat . . . . .	310	Strength of Materials; Kinematics and Dynamics . . . . .	52
Physical Laboratory . . . . .	313	German (or French) . . . . .	161 (151)
General Statics . . . . .	51	Political Economy and Industrial History . . . . .	205
German (or French) . . . . .	161 (151)	Business Law . . . . .	235
Political Economy . . . . .	205		
Business Law . . . . .	235	<i>Options.</i>	
<i>Options.</i>		1. { Mining Engineering . . . . .	481
1. { Structural & Chemical Geology	566	{ Historical Geology . . . . .	569
{ Electricity . . . . .	316, 317	2. { Steam Engineering; Boilers	433
2. { Steam Engineering; Thermodynamics; Valve-Gears . . . . .	433	{ Engineering Laboratory . . . . .	443
{ Drawing . . . . .	439		

SUMMER COURSE IN PRACTICAL METALLURGY OR MINING (ELECTIVE).

FOURTH YEAR.

FIRST TERM.		SECOND TERM.	
Mining Engineering . . . . .	493	Mining Engineering . . . . .	493
Memoirs . . . . .	495	Memoirs . . . . .	495
Metallurgy (non-ferrous) . . . . .	488	Metallurgy (non-ferrous) . . . . .	494
Metallurgy of Iron . . . . .	487	Metallurgical Laboratory . . . . .	492
Metallurgical Laboratory . . . . .	492	Quantitative Analysis (lectures and laboratory) . . . . .	269, 274
Quantitative Analysis (lectures and laboratory) . . . . .	269, 274	Thesis.	
Heat Measurements <sup>1</sup> . . . . .	328	<i>Options.</i>	
Strength of Materials; Friction . . . . .	57	1. { Quantitative Analysis (additional) <sup>1</sup> . . . . .	274
Elements of Dynamo Machinery <sup>2</sup> . . . . .	340	{ Political Economy and Industrial History <sup>2</sup> . . . . .	205
<i>Options.</i>		2. { Engineering Laboratory . . . . .	456
1. { Quantitative Analysis (additional) <sup>1</sup> . . . . .	274		
{ Electrical Measurements <sup>2</sup> . . . . .	323		
{ Political Economy <sup>2</sup> . . . . .	205		
2. { Hydraulics . . . . .	391		

<sup>1</sup> For classes entering after 1893.

<sup>2</sup> For classes entering before 1894.

#### IV.—ARCHITECTURE.

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

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

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

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

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

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

Persons applying for admission as special students in architecture must be college graduates, or twenty-one years of age with not less than two years' office experience. They will be required to pass, before entrance, examinations<sup>1</sup> in plane geometry, and freehand and mechanical drawing (including projections, isometric and the elements of descriptive geometry); and must include in their work at the Institute the regular courses in freehand drawing, solid geometry, and descriptive geometry, unless already proficient in these subjects. (See page 101.)

<sup>1</sup> See "Advanced Standing Examinations," Calendar, page 2

## IV.—ARCHITECTURE.

FIRST YEAR. SEE PAGE 27.

## SECOND YEAR.

FIRST TERM.		SECOND TERM.	
Orders . . . . .	510	Design . . . . .	514
Materials . . . . .	512	Perspective . . . . .	513
Shades and Shadows . . . . .	511	Stereotomy . . . . .	515
Freehand Drawing . . . . .	83	Freehand Drawing . . . . .	83
Differential Calculus . . . . .	29	Integral Calculus . . . . .	32
Physics: Mechanics, Wave Mo- tion, Electricity (lectures) . . . . .	300	Physics: Electricity, Optics (lec- tures) . . . . .	300
German (or French) . . . . .	160 (150)	German (or French) . . . . .	160 (150)
English Literature . . . . .	125	English Literature and Composi- tion . . . . .	125
European History . . . . .	181		

## THIRD YEAR.

FIRST TERM.		SECOND TERM.	
Design . . . . .	522	Design . . . . .	522
Ancient Architecture . . . . .	517	Mediaeval Architecture . . . . .	517
Specifications and Working Drawings . . . . .	520	Specifications and Working Drawings . . . . .	520
Freehand Drawing . . . . .	84	Water Color . . . . .	523
Building Stones . . . . .	564	Freehand Drawing . . . . .	84
Heating and Ventilation . . . . .	309	Pen and Ink . . . . .	516
General Statics . . . . .	51	Strength of Materials . . . . .	53
German (or French) . . . . .	161 (151)	German (or French) . . . . .	161 (151)
Political Economy . . . . .	205	Political Economy and Industrial History . . . . .	205
Business Law . . . . .	235	Business Law . . . . .	235

## FOURTH YEAR.

FIRST TERM.		SECOND TERM.	
Design . . . . .	532	Design: Thesis . . . . .	532
Architecture of the Renaissance . . . . .	541	Architecture of the Renaissance . . . . .	541
Constructive Design . . . . .	536	History of Painting and Sculpture . . . . .	542
History of Construction . . . . .	530	Business Relations, Contracts, etc. . . . .	537
Heating and Ventilation <sup>1</sup> . . . . .	339	History of Ornament . . . . .	531
Color and Acoustics . . . . .	329	Modelling . . . . .	539
History of Ornament . . . . .	531	Water Color . . . . .	534
Modelling . . . . .	539	Pen and Ink . . . . .	524
Water Color . . . . .	534	Life Class . . . . .	535
Pen and Ink . . . . .	524	Sanitary Science and the Public Health . . . . .	629
Life Class . . . . .	535	History and Literature of the Re- naissance and the Reformation . . . . .	185
Strength of Materials . . . . .	58		
History and Literature of the Re- naissance and the Reformation . . . . .	185		

<sup>1</sup> For classes entering before 1894.

## V.—CHEMISTRY.

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

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

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

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

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

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

## V. — CHEMISTRY.

FIRST YEAR. SEE PAGE 27.

## SECOND YEAR.

FIRST TERM.		SECOND TERM.	
Qualitative Analysis (lectures and laboratory) . . . . .	246	Quantitative Analysis (lectures and laboratory) . . . . .	255
Theoretical Chemistry . . . . .	245	Mineralogy and Blowpipe Analysis . . . . .	561, 562
Physics: Mechanics, Wave Motion, Electricity (lectures) . . . . .	300	Physics: Electricity, Optics (lectures) . . . . .	300
German (or French) . . . . .	160 (150)	German (or French) . . . . .	160 (150)
English Literature . . . . .	125	English Literature and Composition . . . . .	125
European History . . . . .	181		
<i>Options.</i>		<i>Options.</i>	
1. Differential Calculus . . . . .	29	1. Integral Calculus . . . . .	32
2. { Elements of Differential and Integral Calculus . . . . .	28	2. { Physical Geography . . . . .	560
		{ General Biology . . . . .	604
		{ Microscopy . . . . .	603

## THIRD YEAR.

FIRST TERM.		SECOND TERM.	
Quantitative Analysis (lectures and laboratory) . . . . .	269, 271	Quantitative Analysis (lectures and laboratory) . . . . .	269, 271
Industrial Chemistry . . . . .	266	Elements of Organic Chemistry . . . . .	264
Theoretical Chemistry . . . . .	263	Industrial Chemistry . . . . .	266
Physics: Heat . . . . .	310	Assaying . . . . .	483
Physical Laboratory . . . . .	311	Physical Laboratory . . . . .	311
German (or French) . . . . .	161 (151)	German (or French) . . . . .	161 (151)
Political Economy . . . . .	205	Political Economy and Industrial History . . . . .	205
Business Law . . . . .	235	Business Law . . . . .	235
<i>Options.</i>		<i>Options.</i>	
Structural and Chemical Geology . . . . .	566	Electricity . . . . .	319
Sanitary Chemistry . . . . .	277	Historical Geology . . . . .	569
Industrial Chemical Laboratory . . . . .	267	Sanitary Chemistry . . . . .	277
		Industrial Chemical Laboratory . . . . .	267

## FOURTH YEAR.

FIRST TERM.		SECOND TERM.	
Organic Chemistry (lectures) . . . . .	282	Organic Chemistry (lectures) . . . . .	282
Organic Analysis . . . . .	279	Gas Analysis . . . . .	290
Organic Preparations and Reactions . . . . .	285	Theoretical Chemistry . . . . .	265
Elements of Non-Ferrous Metallurgy <sup>1</sup> . . . . .	489	Electrical and Heat Measurements . . . . .	353
Metallurgy of Iron . . . . .	487	Memoirs . . . . .	295
Sugar Analysis <sup>1</sup> . . . . .	292	Thesis.	
Testing of Oils . . . . .	286	<i>Options.</i>	
Industrial Electricity . . . . .	316	Physico-Chemical Laboratory . . . . .	351
<i>Options.</i>		Non-Ferrous Metallurgy . . . . .	494
Sanitary Chemistry . . . . .	287		
Textile Coloring . . . . .	288		
Bacteriology . . . . .	628		
Industrial Biology . . . . .	619		
Non-Ferrous Metallurgy, Ore Dressing, and Metallurgical Laboratory . . . . .	490, 492		

<sup>1</sup> Omitted by students taking 490, 492.

## VI.—ELECTRICAL ENGINEERING.

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

The work in engineering runs parallel with the electrical subjects, since in all branches of electrical engineering a sound knowledge of mechanics and motors, of measurements of power and of the means of its transmission, etc., is essential. Thus, the second year includes the studies of mechanism, shopwork, and drawing, and the third year, applied mechanics, steam engineering, and hydraulics. Certain of these subjects are also continued in the fourth year.

An extended course in physics begins with the second year, and is continued, by lectures, recitations, and laboratory work, to the end of the third year. A portion of this is devoted to electricity; and at the middle 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 fourth year. Work in the physical laboratory begins at the middle of the second year, and leads up to electrical measurements and testing. Extended courses on the technical applications of electricity to the telegraph, telephone, electric lighting, the electrical generation, transmission, and utilization of power, etc., are given, chiefly in the fourth year. Electrical study and research occupy the principal position in this year. A series of advanced mathematical topics also forms an important part of the work. (See pages 77 and 89.)

A new course of lectures upon the industrial applications of electro-chemistry has been instituted, and also a course relating to the economics of corporations. Provision will be made for any who desire to pursue the study of chemistry to a greater extent than is provided for in the course scheme.

## VI.—ELECTRICAL ENGINEERING.

FIRST YEAR. SEE PAGE 27.

## SECOND YEAR.

FIRST TERM.	SECOND TERM.
Physics: Mechanics, Wave Motion, Electricity (lectures) . . . 300	Physics: Electricity, Optics (lect.) 300
Acoustics . . . . . 302	Physical Laboratory: Mechanics, Optics . . . . . 303
Principles of Mechanism . . . . 420	Physical Measurements (lectures) 305
Differential Calculus . . . . . 29	Theoretical Electricity . . . . . 306
Descriptive Geometry . . . . . 78	Mechanism: Gear-Teeth; Machine Tools . . . . . 428
Carpentry and Metal-turning . 97, 106	Drawing . . . . . 425
German (or French) . . . . . 160 (150)	Integral Calculus . . . . . 32
English Literature . . . . . 125	Carpentry and Wood-turning . . . 97
European History . . . . . 181	German (or French) . . . . . 160 (150)
	English Literature and Composition 125

## THIRD YEAR.

FIRST TERM.	SECOND TERM.
Physics: Heat (lectures) . . . . 310	Physical Laboratory: Heat and Electrical Measurements . . . . 313
Physical Laboratory: Optics, Heat . . 313	Theoretical Electricity . . . . . 315
Theoretical Electricity . . . . . 315	Electrical Measuring Instruments and Methods . . . . . 319
Methods of Telegraphy . . . . . 314	Steam Engineering: Boilers . . . . 433
Elements of Industrial Electricity 316	Engineering Laboratory . . . . . 443
Steam Engineering: Valve-Gears; Thermodynamics . . . . . 433	Drawing . . . . . 440
Drawing . . . . . 440	Strength of Materials; Kinematics and Dynamics . . . . . 52
Differential Equations . . . . . 35	German (or French) . . . . . 161 (151)
General Statics . . . . . 51	Political Economy and Industrial History . . . . . 205
German (or French) . . . . . 161 (151)	Business Law <sup>1</sup> . . . . . 235
Political Economy . . . . . 205	
Business Law <sup>1</sup> . . . . . 235	

## FOURTH YEAR.

FIRST TERM.	SECOND TERM.
Technical Applications of Electricity to Telephony, Electric Lighting, Electrical Generation and Transmission of Power, Railroad Signals, etc. . . . . 333, 335	Technical Applications of Electricity; Telephone Engineering, Electro-Motors, Dynamo Design . . . . . 333, 334, 336, 343, 344
General Electrical Testing; Testing of Dynamo Machines 327, 336	Theory of Periodic Currents . . . . 332
Electrical Measuring Instruments and Methods . . . . . 322	Discussion of the Precision of Measurements . . . . . 342
Theory of Periodic Currents . . . . 332	Engineering Laboratory . . . . . 455
Photometry . . . . . 337	Differential Equations <sup>3</sup> . . . . . 43
Steam Engineering . . . . . 450	Economics of Corporations <sup>2</sup> . . . 217
Dynamics of Machines . . . . . 452	Thesis.
Hydraulics . . . . . 391	
Engineering Laboratory . . . . . 455	
Strength of Materials; Friction . . 57	
Method of Least Squares . . . . . 42	

NOTE.— Students having the requisite preparation and ability may pursue more advanced courses in the mathematical theory of electricity and other subjects. With this end in view, competent students may take Fourier's Series and allied topics, also Energetics and Electro-Chemistry, as extra studies. The study of Advanced German is advised.

<sup>1</sup> Alternate years. <sup>2</sup> For classes entering after 1893. <sup>3</sup> For classes entering before 1894.



## BIOLOGY.

The course in biology affords a training in those sciences which pertain to living things. Those who take it usually intend to become physicians, or teachers, or to fill positions connected with public works or the civil service, or to engage in some of the various fermentation industries as experts in bacteriology or microscopy.

Some of the best medical schools are already requiring for admission special training such as this course affords, and it is generally conceded that for the scientific or professional study of medicine no preparation can equal a well-considered and liberal education in which chemistry, physics and biology, comparative anatomy and embryology, comparative physiology and microscopic anatomy, bacteriology and sanitary science, are prominent features.

The need for thoroughly trained teachers of the natural sciences was never greater than to-day, and for several years a large number of teachers in actual service have resorted to the Institute for instruction in biology. There is good reason to believe that the public school service now offers an inviting career to educated teachers, and that the course in biology, owing to its broad and comprehensive character, affords a good preparation for persons intending to teach, or to direct teaching, in the so-called "nature studies," or the natural sciences.

The course in biology is also adapted for those who desire to enter the civil service with boards of health, water boards, or sewer departments on the sanitary side, as bacteriologists or microscopists, as well as for such as intend to devote themselves to processes connected with dairying, vinegar-making, pickling, canning, cold-storage, or other food-making, fermentation, or food-preserving industries.

The subjects of study and their sequence are shown on the opposite page. Abundant opportunities for the regular practical work of the course are provided in the various laboratories of the Institute, especially the chemical, physical, geological, physiological, and bacteriological.

Opportunities are also provided for special advanced work in general bacteriology, industrial biology, and sanitary science; in physiology and hygiene; and, to some extent, in zoölogy and botany. (For more detailed information see pp. 103-106, and the special circular on Biology.)

## VII.—BIOLOGY.

FIRST YEAR. SEE PAGE 27.

## SECOND YEAR.

FIRST TERM.	SECOND TERM.
General Biology . . . . . 600	General Botany . . . . . 606
Qualitative Analysis (lectures and laboratory) . . . . . 246	General Zoölogy . . . . . 605
Theoretical Chemistry . . . . . 245	Quantitative Analysis (lectures and laboratory) . . . . . 255
Physics: Mechanics, Wave Motion, Electricity (lectures) . . . . . 300	Mineralogy and Blowpipe Analysis . . . . . 561, 562
German (or French) . . . . . 160 (150)	Physical Geography . . . . . 560
English Literature . . . . . 125	Physics: Electricity, Optics (lectures) . . . . . 300
European History . . . . . 181	German (or French) . . . . . 160 (150)
	English Literature and Composition . . . . . 125

## THIRD YEAR.

FIRST TERM.	SECOND TERM.
Comparative Anatomy . . . . . 612	Comparative Anatomy and Embryology . . . . . 612
Anthropology . . . . . 615	Cryptogamic Botany . . . . . 616
Quantitative Analysis (lectures and laboratory) . . . . . 269, 270	Sanitary Chemistry . . . . . 277
Elements of Organic Chemistry . . . . . 262	Historical Geology . . . . . 569
Structural and Chemical Geology . . . . . 566	Physical Laboratory . . . . . 311
Physics: Heat . . . . . 310	German (or French) . . . . . 161 (151)
Physical Laboratory . . . . . 311	Political Economy and Industrial History . . . . . 205
German (or French) . . . . . 161 (151)	Business Law . . . . . 235
Political Economy . . . . . 205	
Business Law . . . . . 235	

## FOURTH YEAR.

FIRST TERM.	SECOND TERM.
Comparative Physiology . . . . . 620	Comparative Physiology . . . . . 620
Physiological Laboratory . . . . . 621	Physiological Laboratory . . . . . 621
Theoretical Biology . . . . . 624	Theoretical Biology . . . . . 624
Microscopic Anatomy . . . . . 622	Microscopic Anatomy . . . . . 622
Bacteriology . . . . . 628	Sanitary Science and the Public Health . . . . . 629
Industrial Biology . . . . . 619	Journals . . . . . 618
History of the Inductive Sciences . . . . . 627	Thesis.
Journals . . . . . 618	
<i>Options.</i>	
1. { History and Literature of the Renaissance and the Reformation . . . . . 185	1. { Sanitary Biology or . . . . . 630
{ Climatology . . . . . 580	{ Descriptive Sociology . . . . . 225
2. { Organic Chemistry . . . . . 282	2. { History and Literature of the Renaissance and the Reformation . . . . . 185
{ Organic Analysis . . . . . 279	{ Sanitary Biology . . . . . 630
	{ Organic Chemistry . . . . . 282

### VIII.—PHYSICS.

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

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

Beyond the particular alternative studies set forth in the course scheme, a certain further liberty of substitution may be allowed by the Faculty in the case of students in Course VIII. who are fitting themselves for some special line of work.

## VIII. — PHYSICS.

FIRST YEAR. SEE PAGE 27.

## SECOND YEAR.

FIRST TERM.	SECOND TERM.
Physics: Mechanics, Wave Motion, Electricity (lectures) . . . 300	Physics: Electricity, Optics (lect.) 300
Acoustics . . . . . 302	Physical Laboratory: Mechanics, Optics . . . . . 303
Qualitative Analysis (lectures and laboratory) . . . . . 247	Physical Measurements (lectures) 305
Theoretical Chemistry . . . . . 245	Theoretical Electricity . . . . . 306
Descriptive Astronomy . . . . . 301	Quantitative Analysis (lectures and laboratory) . . . . . 257
Differential Calculus . . . . . 29	Microscopy . . . . . 603
German (or French) . . . . . 160 (150)	Integral Calculus . . . . . 32
English Literature . . . . . 125	German (or French) . . . . . 160 (150)
European History . . . . . 181	English Literature and Composition 125
	<i>Options.</i>
	Quantitative Analysis (additional) 257
	Determinants . . . . . 31

## THIRD YEAR.

FIRST TERM.	SECOND TERM.
Physics: Heat (lectures) . . . . . 310	Physical Laboratory: Heat and Electrical Measurements . . . . . 312
Physical Laboratory: Optics, Heat 312	Physico-Chemical Laboratory . . . . . 351
Theoretical Electricity . . . . . 315	Theoretical Electricity . . . . . 315
Methods of Telegraphy . . . . . 314	Electrical Measuring Instruments and Methods . . . . . 319
Elements of Industrial Electricity 316	Theoretical Chemistry . . . . . 265
Elements of Organic Chemistry . . . . . 262	Analytical Mechanics . . . . . 54
Theoretical Chemistry: Solutions 263	German (or French) . . . . . 161 (151)
Differential Equations . . . . . 35	Political Economy and Industrial History . . . . . 205
German (or French) . . . . . 161 (151)	Business Law <sup>1</sup> . . . . . 235
Political Economy . . . . . 205	
Business Law <sup>1</sup> . . . . . 235	<i>Options.</i>
	Quantitative Analysis . . . . . 269, 272
<i>Options.</i>	Analytic Geometry of Three Dimensions; Advanced Calculus and Definite Integrals . . . . . 39
{ Quantitative Analysis . . . . . 269, 272	
{ Physiology of the Senses . . . . . 614	
{ or Shop-work . . . . . 98	
{ Quaternions . . . . . 37	
{ or Quantitative Analysis 269, 272	
{ General Theory of Equations 33	

## FOURTH YEAR.

FIRST TERM.	SECOND TERM.
Electrical Testing; Heat Measurements . . . . . 327, 328	Theory of Periodic Currents . . . . . 332
Theory of Periodic Currents . . . . . 332	or Theory of Potential . . . . . 352
Electrical Measuring Instruments and Methods . . . . . 322	Optics . . . . . 331
Optics . . . . . 331	Electro-Chemistry . . . . . 350
Photometry . . . . . 337	Analytical Mechanics . . . . . 55
Energetics . . . . . 347	Discussion of the Precision of Measurements . . . . . 342
Physical Colloquium . . . . . 324	Principles of Scientific Investigation . . . . . 330
Analytical Mechanics . . . . . 55	Physical Colloquium . . . . . 324
Method of Least Squares . . . . . 42	Physical Research: Thesis.
History of Science . . . . . 627	<i>Options.</i>
<i>Options.</i>	Special Work; Chemistry . . . . . 282
Organic Chemistry . . . . . 279 or 282	or Physics . . . . . 351
Fourier's Series; Laplace's Coefficients . . . . . 41	Fourier's Series; Laplace's Coefficients . . . . . 41
	Physiological Measurements . . . . . 632

<sup>1</sup> Alternate Years

### IX. — GENERAL STUDIES.

This course is designed especially for those students who wish to secure an education based upon scientific study and experiment but including a larger amount of history, economics, language, and literature than is possible in technical courses. It is adapted to the needs of those who expect to engage in trade, banking, manufacturing, or journalism, or in the teaching of social or political science. For administrative positions in business, a careful knowledge of political and social relations is essential; and it is believed that the origin, growth, and laws of political and industrial society can best be approached through the methods used in natural science. The uniform requirement of the Institute in physics and a considerable share of the general training in chemistry are preserved in this course. From the study of biology, including botany and zoölogy, as a basis, the student is prepared to proceed to the study of man in society, and to consider the history and significance of social institutions, such as the family, the state, and the church. Physical science, biology, anthropology, social science and history, political and industrial history, and international law thus present, throughout the course, a definite, progressive relationship.

The fact is, moreover, kept in view in this course, that success in practical as in intellectual life must depend largely upon breadth and flexibility of mind, such as is best cultivated by an intelligent and appreciative acquaintance with literature. The study of the history and development of the English language is made to lead the way to a careful survey of English literature, the effort being to make the work not mechanical, but sympathetic and vital.

Other special features of the department of General Studies are: More extended study of modern languages; a continuous course of historical study, directed especially toward the political and social history of England and the United States; drill in the essential principles of English composition; an orderly study of economics, including its theory and history, with courses in industrial and commercial history and geography, finance, and statistics. The student may be permitted to substitute certain subjects in other courses, as biology or mathematics, provided his individual aptitudes justify such a liberty. (See pages 110 to 114.)

## IX.—GENERAL STUDIES.

FIRST YEAR. SEE PAGE 27.

## SECOND YEAR.

FIRST TERM.	SECOND TERM.
European History since 1815: . . . . .	History of England . . . . . 182
History of England . . . . . 182	English Literature and Composition 125
Political Economy . . . . . 200	French; German . . . . . 153, 160
Economic Problems . . . . . 201	Zoölogy and Botany . . . . . 605, 606
English Literature . . . . . 125	Physical Geography . . . . . 560
French; German . . . . . 153, 160	Physics; Electricity, Optics (lectures) . . . . . 300
General Biology . . . . . 602	Physical Laboratory . . . . . 304
Physics; Mechanics, Wave Motion, Electricity (lectures) . . . . . 300	

## THIRD YEAR.

FIRST TERM.	SECOND TERM.
History and Literature of the Renaissance and the Reformation 185	History and Literature of the Renaissance and the Reformation 185
Financial History of United States <sup>1</sup> 210	History of Commerce <sup>1</sup> . . . . . 212
Statistics . . . . . 206	Descriptive Sociology . . . . . 225
Commercial Geography <sup>1</sup> . . . . . 211	Business Law . . . . . 235
Anthropology . . . . . 615	German (with sight-reading) . 161, 164
Business Law . . . . . 235	Historical Geology . . . . . 569
German (with sight-reading) . 161, 164	
Structural Geology . . . . . 565	
Physics: Heat . . . . . 310	
<i>Options.</i> <sup>2</sup>	<i>Options.</i> <sup>2</sup>
History of England in the 16th and 17th Centuries . . . . . 184	History of England in the 16th and 17th Centuries . . . . . 184
Theories and Methods of Social Reform . . . . . 214	Theories and Methods of Social Reform . . . . . 214
English Literature to 1560 . . . . . 129	English Literature: 1560-1660 . . . . . 129
	French . . . . . 155

## FOURTH YEAR.

FIRST TERM.	SECOND TERM.
Comparative Politics . . . . . 226	Comparative Politics . . . . . 226
International Law . . . . . 227	History of Industry <sup>1</sup> . . . . . 213
Taxation and Administration <sup>1</sup> . 215	History and Elements of Philosophy . . . . . 188
English Literature: 1660-1780 . 130	English Literature: 1780-1860 . 131
Physiology . . . . . 626	Sanitary Science and the Public Health . . . . . 629
Climatology . . . . . 580	Thesis.
<i>Options.</i>	<i>Options.</i>
History of Era of French Revolution . . . . . 186	History of Era of French Revolution 186
Local United States History . . . . . 187	Local United States History . . . . . 187
Statistics of Sociology . . . . . 207	Banking and Finance . . . . . 230
Contemporary English and American Literature . . . . . 132	History of Economic Theory . . . . . 216
Language: Special Work in French or German, or Elements of Spanish or Italian . . . 165, 166	English Composition (advanced course) . . . . . 134
	Journalism . . . . . 135
	Language: First Term continued . . . . . 165, 166

<sup>1</sup> Alternating studies.<sup>2</sup> In this year an option in Latin Readings, with special reference to English Etymology, may be chosen by students qualified for such work.

## X.—CHEMICAL ENGINEERING.

This course is arranged to meet the needs of students who desire, in addition to a general training in mechanical engineering, a good knowledge of the applications of chemistry to the arts. 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. Thus he 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 for operations involving the use of furnaces; or in organic chemistry, if he intends to engage in the manufacture of dyes or other organic products. Graduates in this course 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, paper and pulp mills, the manufacture of fertilizers, soap, heavy chemicals, and various other branches of industry where such special training is demanded.

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 course of instruction in the fourth year is 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 attention is directed to the methods of conducting the mechanical operations in various manufacturing processes. At the same time the chemical principles upon which operations rest are thoroughly taught. (See page 92.)

**X.—CHEMICAL ENGINEERING.**

FIRST YEAR. SEE PAGE 27.

**SECOND YEAR.**

FIRST TERM.	SECOND TERM.
Qualitative Analysis (lectures and laboratory) . . . . . 248	Quantitative Analysis (lectures and laboratory) . . . . . 257
Principles of Mechanism . . . . . 420	Mechanism: Cotton Machinery; Machine Tools; Gear-Teeth . . . . . 427
Differential Calculus . . . . . 29	Drawing . . . . . 423
Physics: Mechanics, Wave Motion, Electricity (lectures) . . . . . 300	Integral Calculus . . . . . 32
Descriptive Geometry . . . . . 78	Physics: Electricity, Optics (lectures) . . . . . 300
German (or French) . . . . . 160 (150)	German (or French) . . . . . 160 (150)

**THIRD YEAR.**

FIRST TERM.	SECOND TERM.
Industrial Chemistry . . . . . 266	Industrial Chemistry . . . . . 266
Elements of Organic Chemistry . . . . . 262	Industrial Chemical Laboratory . . . . . 268
Steam Engineering; Thermodynamics; Valve-Gears . . . . . 433	Steam Engineering: Boilers . . . . . 433
Drawing . . . . . 441	Drawing . . . . . 441
Elements of Differential Equations . . . . . 36	Engineering Laboratory . . . . . 443
Electricity . . . . . 316	Physical Laboratory . . . . . 311
Physics: Heat . . . . . 310	Strength of Materials; Kinematics and Dynamics . . . . . 52
Physical Laboratory . . . . . 311	German (or French) . . . . . 161 (151)
General Statics . . . . . 51	English Literature and Composition . . . . . 125
German (or French) . . . . . 161 (151)	
English Literature . . . . . 125	
European History . . . . . 181	

**FOURTH YEAR.**

FIRST TERM.	SECOND TERM.
Applied Chemistry . . . . . 289	Applied Chemistry: Memoirs . . . . . 289
Chemical and Mechanical Testing of Oils . . . . . 286	Technical Machinery . . . . . 463
Gas Analysis . . . . . 290	Engineering Laboratory . . . . . 455
Steam Engineering . . . . . 450	Strength and Stability of Structures; Theory of Elasticity . . . . . 59
Engineering Laboratory . . . . . 455	Shopwork . . . . . 101, 107
Metallurgy . . . . . 487, 489	Political Economy and Industrial History . . . . . 205
Strength of Materials: Friction . . . . . 57	Business Law . . . . . 235
Dynamics of Machines . . . . . 452	Thesis.
Shopwork . . . . . 98	
Political Economy . . . . . 205	
Business Law . . . . . 235	
<i>Options.</i>	<i>Options.</i>
Textile Coloring . . . . . 288	Metallurgy . . . . . 494
Heat Measurements . . . . . 328	Organic Chemistry . . . . . 282
Organic Chemistry . . . . . 282	Hydraulic Motors . . . . . 400
Hydraulics and Hydraulic Measurements . . . . . 391, 393	Applied Chemistry (additional) . . . . . 289



### 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 which are concerned with problems of the public health, and who, therefore, desire to gain a better knowledge of the subjects of chemistry and biology, and of their relations to engineering problems, than can be obtained in the course in Civil Engineering.

The line of study offered differs from the regular course in Civil Engineering, page 29, in the following particulars:

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

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

The entire instruction in sanitary and hydraulic engineering now given in the course in Civil Engineering, a portion of which is there optional, is required in the course in Sanitary Engineering. (See page 82.)

**XI. — SANITARY ENGINEERING.**

FIRST YEAR. SEE PAGE 27.

**SECOND YEAR.**

FIRST TERM.	SECOND TERM.
Surveying and Plotting . . . . . 360	Surveying and Plotting . . . . . 360
Topographical Drawing . . . . . 362	Qualitative Analysis (lectures and laboratory) . . . . . 250
Elements of Organic Chemistry . . . . . 262	Physical Geography . . . . . 560
Differential Calculus . . . . . 29	Integral Calculus . . . . . 32
Physics: Mechanics, Wave Motion, Electricity (lectures) . . . . . 300	Physics: Electricity, Optics (lectures) . . . . . 300
Descriptive Geometry . . . . . 78	German (or French) . . . . . 160 (150)
German (or French) . . . . . 160 (150)	English Literature and Composition . . . . . 125
English Literature . . . . . 125	
European History . . . . . 181	

**THIRD YEAR.**

FIRST TERM.	SECOND TERM.
R. R. & Highway Engineering: Field-work and Drawing 372,373,374	R. R. & Highway Engineering: Field-work and Drawing 372,373,374
Stereotomy . . . . . 375	Advanced Surveying . . . . . 370
Advanced Surveying . . . . . 370	Theory of Structures . . . . . 376
Quantitative Analysis (lectures and laboratory) . . . . . 250	Water Analysis . . . . . 277
General Biology . . . . . 601	General Zoölogy and Botany . . . . . 605, 606
Structural Geology . . . . . 565	Physical Laboratory . . . . . 311
Physics: Heat . . . . . 310	Strength of Materials: Kinematics and Dynamics; Theory of Elasticity . . . . . 50
Physical Laboratory . . . . . 311	German (or French) . . . . . 161 (151)
General Statics; Stresses in Frames; Strength of Materials . . . . . 50	Political Economy and Industrial History . . . . . 205
German (or French) . . . . . 161 (151)	Business Law . . . . . 235
Political Economy . . . . . 205	
Business Law . . . . . 235	

**FOURTH YEAR.**

FIRST TERM.	SECOND TERM.
Theory of Structures; Bridges and Similar Structures . . . . . 396	Theory of Structures; Bridges and Similar Structures . . . . . 396
Hydraulics . . . . . 390	Hydraulic Engineering . . . . . 401
Hydraulic Measurements . . . . . 393	Hydraulic Machinery . . . . . 405
Sanitary and Hydraulic Engineering . . . . . 392	Design . . . . . 404
Bridge Design . . . . . 399	Chemistry and Bacteriology of Water Purification and Sewage Disposal . . . . . 631
Air Analysis . . . . . 284	Sanitary Science and the Public Health . . . . . 629
Bacteriology . . . . . 628	Sanitary Biology . . . . . 630
Metallurgy of Iron <sup>1</sup> . . . . . 487	Building Construction . . . . . 540
Industrial Electricity <sup>1</sup> . . . . . 316	Engineering Laboratory . . . . . 402
Heating and Ventilation . . . . . 339	Thesis.
Shopwork <sup>1</sup> . . . . . 110	
Strength of Materials: Theory of Elasticity <sup>2</sup> . . . . . 56	

<sup>1</sup> For classes entering after 1893.<sup>2</sup> For classes entering before 1894.

## XII.—GEOLOGY.

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

The demand for men who can represent the physical features of a country topographically, as well as interpret them geologically, has been increased by the modern methods of conducting government and other surveys. That the students may be better prepared for such work, the amount of topographic, geodetic, and hydrographic surveying is larger than has been common in geological courses. Such students are further qualified by the addition of physiographic geology and hydrography with field practice, and by the construction of geologic maps and sections.

The course provides for the education of students who may wish to apply geological science in the development of any of the various mineral resources of a country. To their studies in chemistry and assaying they may add mining and metallurgy if they so elect, while the schedule of the course provides for economic geology and the study of ore deposits.

It is recognized that students preparing to teach and others may, for good reasons, desire an arrangement of studies differing from the schedule, as, for example, in the substitution of natural history studies for those of civil engineering. Applications for such substitution will be entertained by the Faculty. For details of instruction and equipment see pages 106 to 109.

**XII.—GEOLOGY.**

FIRST YEAR. SEE PAGE 27.

**SECOND YEAR.**

FIRST TERM.	SECOND TERM.
Physiography . . . . . 555	Mineralogy and Blowpipe Analysis . . . . . 561, 562
Qualitative Analysis (lectures and laboratory) . . . . . 249	Physical Geography . . . . . 560
General Biology . . . . . 602	Quantitative Analysis (lectures and laboratory) . . . . . 258
Surveying and Plotting . . . . . 360, 362	Surveying and Plotting . . . . . 360
Physics: Mechanics, Wave Motion, Electricity (lectures) . . . . . 300	Physics: Electricity, Optics (lectures) . . . . . 300
German (or French) . . . . . 160 (150)	German (or French) . . . . . 160 (150)
English Literature . . . . . 125	English Literature and Composition . . . . . 125
European History . . . . . 181	

FIELD-WORK IN MINERALOGY (ELECTIVE).

**THIRD YEAR.**

FIRST TERM.	SECOND TERM.
Structural and Chemical Geology . . . . . 566	Historical Geology . . . . . 569
Geological Field-work and Sketching . . . . . 567	Geological Maps and Sections . . . . . 571
Structural Palæontology . . . . . 572	Mineralogy . . . . . 570
Anthropology . . . . . 615	Structural Palæontology . . . . . 572
Quantitative Analysis (lectures and laboratory) . . . . . 269, 273	Zoölogy and Botany . . . . . 605, 606
Topographical Surveying . . . . . 370	Quantitative Analysis (lectures and laboratory) . . . . . 269, 273
Physics: Heat . . . . . 310	Topographical Surveying . . . . . 370
Physical Laboratory . . . . . 311	Physical Laboratory . . . . . 311
German (or French) . . . . . 161 (151)	German (or French) . . . . . 161 (151)
Political Economy . . . . . 205	Political Economy and Industrial History . . . . . 205
Business Law . . . . . 235	Business Law . . . . . 235

SUMMER COURSE IN GEOLOGY AND TOPOGRAPHY.

**FOURTH YEAR.**

FIRST TERM.	SECOND TERM.
Physiographic Geology . . . . . 583	Economic Geology . . . . . 587
Ore Deposits . . . . . 591	Micro-Lithology . . . . . 589
Micro-Lithology . . . . . 589	Geological Field-work and Laboratory . . . . . 581
Geological Field-work and Laboratory . . . . . 581	Geological Memoirs . . . . . 584
Geological Memoirs . . . . . 584	Hydrography . . . . . 590
Climatology . . . . . 580	Assaying . . . . . 484
Geodetic Surveying . . . . . 389	Thesis.
Hydraulic Measurements . . . . . 393	
<i>Options.</i>	
1. Stratigraphic Palæontology . . . . . 586	
2. { Mining Engineering . . . . . 481	
{ Metallurgy . . . . . 488	

### XIII.—NAVAL ARCHITECTURE.

This course offers instruction in the theory and methods of designing and building ships, together with a study of the properties requisite for the safety and good behavior of a ship at sea.

While attention is given mainly to the construction of merchant steamships, the methods used are as thorough and complete as those employed in designing naval vessels, and due attention is given to problems that arise only in the design of a man-of-war, or which are more conveniently treated in connection therewith. Some attention also is given to sailing vessels.

In addition to the literary, mathematical, and general scientific studies requisite for a well-rounded education and for proper preparation for the special work of the course, thorough training is given in mechanism, thermodynamics, applied mechanics, hydraulics, steam engineering, and marine engineering. It is believed that the best co-ordination of the design of a steamship and its propelling machinery is attained by a naval constructor who is familiar with both branches of his profession.

In the third year of the course, lectures are given on the methods of building ships in iron and steel, on the general properties of floating bodies, on statical and dynamical stability of ships, and on such special problems as launching and docking. In the fourth year the lectures treat of the strength of ships, resistance and propulsion, rolling of ships, theory of oscillating waves and waves of translation, and the steering and manœuvring of ships. The lectures are accompanied by two or three exercises a week in drawing, in which the students make the calculations and constructions described in the lectures, and thus gain a proper appreciation of the principles learned and some facility in applying them.

The work in applied mechanics and steam engineering is accompanied by a full course in the laboratories of engineering and applied mechanics. Instruction is given in the shops, in forging, chipping and filing, and machine-tool work. (See also page 87).

## XIII.—NAVAL ARCHITECTURE.

FIRST YEAR. SEE PAGE 27.

## SECOND YEAR.

FIRST TERM.		SECOND TERM.	
Principles of Mechanism . . . . .	420	Mechanism : Gear-Teeth ; Machine Tools . . . . .	428
Drawing . . . . .	422	Drawing . . . . .	426
Forging . . . . .	100	Forging, Chipping and Filing . . . . .	100, 102
Differential Calculus . . . . .	29	Integral Calculus . . . . .	32
Physics : Mechanics, Wave Motion, Electricity (lectures) . . . . .	300	Physics : Electricity, Optics (lectures) . . . . .	300
Descriptive Geometry . . . . .	78	German (or French) . . . . .	160, (150)
German (or French) . . . . .	160 (150)	English Literature and Composition . . . . .	125
English Literature . . . . .	125		
European History . . . . .	181		

## THIRD YEAR.

FIRST TERM.		SECOND TERM.	
Naval Architecture . . . . .	474	Naval Architecture . . . . .	474
Naval Architectural Drawing . . . . .	475	Naval Architectural Drawing . . . . .	475
Mechanism Design . . . . .	442	Steam Engineering ; Boilers . . . . .	433
Steam Engineering ; Valve-Gears ; Thermodynamics . . . . .	433	Engineering Laboratory . . . . .	443
Elements of Differential Equations . . . . .	36	Physical Laboratory . . . . .	311
Physics : Heat . . . . .	310	Strength of Materials : Kinematics and Dynamics . . . . .	52
Physical Laboratory . . . . .	311	German (or French) . . . . .	161 (151)
General Statics . . . . .	51	Political Economy and Industrial History . . . . .	205
German (or French) . . . . .	161 (151)	Business Law . . . . .	235
Political Economy . . . . .	205		
Business Law . . . . .	235		

## FOURTH YEAR.

FIRST TERM.		SECOND TERM.	
Naval Architecture . . . . .	476	Naval Architecture . . . . .	476
Naval Architectural Drawing . . . . .	477	Naval Architectural Drawing . . . . .	477
Marine Engineering . . . . .	461	Marine Engineering . . . . .	461
Steam Engineering . . . . .	450	Engineering Laboratory . . . . .	455
Hydraulics . . . . .	391	Strength and Stability of Structures ; Theory of Elasticity . . . . .	59
Dynamo Machinery . . . . .	340	Machine Tool Work <sup>2</sup> . . . . .	104
Engineering Laboratory . . . . .	455	Political Economy and Industrial History <sup>1</sup> . . . . .	203
Dynamics of Machines . . . . .	451	Thesis . . . . .	
Strength of Materials ; Friction . . . . .	57		
Chipping and Filing ; Machine-Tool Work . . . . .	103, 104		
Metallurgy of Iron . . . . .	487		

<sup>1</sup> For classes entering before 1894<sup>2</sup> For classes entering after 1893.

#### FIVE-YEAR REGULAR COURSES.

The foregoing schedules of the regular courses are arranged for the completion of the work in four years. A student who can devote five years to his course will, however, often find it advantageous to do so. He is thus enabled to perform it more thoroughly, and, on the other hand, to accomplish certain valuable work which has been necessarily omitted from the schedule of the four-year course. Moreover, considerations of health, lack of opportunities for thorough preparation, or other causes may render it advisable for a student to extend the work over five years. To meet such cases, the Faculty have arranged, in most departments, five-year courses which contain the same subjects as the corresponding four-year courses, and differ from them only in the time over which the work is distributed, and, to a slight extent, in the sequence of studies. They lead respectively to the same degrees as the corresponding four-year courses. The standard of scholarship required of the student is in every way the same, and he is classed as a regular student so long as he maintains his standing in the course which he is pursuing.

Further information may be had upon application to the Secretary of the Institute.<sup>1</sup>

#### GRADUATE COURSES.

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

The applicant for the degree of Master of Science must, except in cases of unusual attainment, have taken his first degree in science in some science school, college, or university of good standing; and his attainments must in general be equivalent to those required for the corresponding Bachelor's degree of the Institute. He must file with the Secretary, before being accepted as a candidate, a statement of his previous work and present attainments, and of the advanced work

<sup>1</sup> A special circular will be sent on application.

which he proposes to do at the Institute. The candidate, if a graduate of the Institute, may offer either more advanced work in his own department or undergraduate professional work of an allied department; but, in general, his subjects must not be all of the latter class, and he will be expected to present a thesis of higher grade than is required for the Bachelor's degree. He must pursue his course of study continuously under the direction and oversight of the Faculty for at least one full school year after filing his application, exhibiting during that time ability to conduct original investigations, and passing creditable examinations at such times and on such subjects as may be designated, and must finally present an acceptable thesis.

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

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

It will not in general be necessary for the candidate for the Master's degree to complete all the prescribed studies of the second department; thus, for example, a graduate in



Electrical Engineering desiring to spend an additional year in the department of Mechanical Engineering may be excused from a certain amount of Shopwork and Drawing.

A circular giving additional details will be mailed on application.

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

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

Advanced courses in chosen lines of study, and without reference to degrees, may be pursued by graduates of the Institute without preliminary examination, or by graduates of other institutions who satisfy the Faculty, by examination or otherwise, that they are qualified to take with advantage the courses proposed.

#### SPECIAL STUDENTS.

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

All special students in Chemistry who do not come under the two classes to be mentioned in the following paragraph must pass the full entrance examinations. For requirements regarding special students in Architecture, see page 34.

Persons of mature years who are engaged in technical pursuits will be afforded opportunities for the pursuit of laboratory and lecture courses without the exaction of the usual requirements for admission. Moreover, the attention of teachers who desire to qualify themselves for a higher degree of advancement in their profession is called to the

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

A special circular in regard to Opportunities for Teachers will be mailed on application to the Secretary.

#### SUMMER COURSES.

During the summer vacation, after the close of the school-year, formal instruction in a considerable range of studies is given in the lecture-rooms and laboratories of the Institute by members of the instructing staff. The courses offered in the summer of 1896 were as follows: Mechanical Drawing and Descriptive Geometry; Advanced Algebra, Solid Geometry, Analytic Geometry, and Integral Calculus; Shades and Shadows, Orders, and Design; Analytical Chemistry, Organic Analysis and Preparations; General Biology, Bacteriology, and the Micro-Organisms of Fermentation; Physics, including Mechanics, Light, Electricity, Heat, and Physical Measurements; Mechanism; Woodwork, Forging, Chipping and Filing, and Machine-Tool Work; American History; French and German. The work offered is planned with particular reference to subsequent study at the Institute. Students taking these courses have an opportunity to anticipate portions of the work of the succeeding year, and thus to include a wider range of subjects, or to make greater advancement along a particular line. Again, students who, through sick-

ness, or other cause, have failed to complete the work of the previous year at the proper time are enabled to obtain clear records before the opening of the fall term. Finally, persons desiring to enter with advanced standing—in particular, college graduates—may make up in the summer school deficiencies, professional or otherwise, which might cause serious embarrassment in their choice of studies and in the arrangement of their hours.

A special circular, giving full details in regard to dates and subjects, will be sent on application after March 1.

For information in regard to professional summer schools devoted mainly to "field work" in Mining Engineering, in Surveying, Geology, and Hydraulic Engineering, and in Architecture, which have for a long time been maintained by the Institute with valuable results to the departments concerned, see pages 84, 100, 102, and 109.

## Requirements for Admission.

---

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

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

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

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

Applicants for *advanced standing* — that is, for admission to classes above the first year — must pass the entrance examinations, exception being made of applicants from

other colleges (see page 68), and must present themselves for further examination (see page 67), at 9 A. M., on the Friday and following days 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 special examinations if required in such cases.

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

#### ADMISSION TO THE REGULAR COURSES.

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

The requirements in the various subjects are as follows:

**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; ratio and proportion; arithmetical progression; geometrical progres-

sion. A satisfactory treatment of the topics in Algebra may be found in any of the following text-books: Wells' Academic Algebra, Wentworth's School Algebra, or Bradbury and Emery's Academic Algebra.

**Plane Geometry.** — As much as is contained in the first five books of Wells' (revised edition), 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.

In addition to the above, applicants are required to offer either Advanced Algebra or Solid Geometry. It is the opinion of the Faculty that Solid Geometry should be chosen, where practicable, as better adapted for secondary school work.

It is the intention of the Faculty to make Solid Geometry an absolute requirement, and to make Advanced Algebra alternative with Elementary Trigonometry as soon as it shall appear that the secondary schools are generally able to meet this advance.

The detailed requirements in these subjects are as follows:

In **Advanced Algebra**:<sup>1</sup> inequalities; *interpretation of  $\frac{a}{x}$ ,  $\frac{a}{0}$ , and  $\frac{0}{0}$* ; solution of equations by factoring; theory of quadratic equations; factoring of quadratic expressions; *variation; harmonical progression*; proofs of the binomial theorem for positive integral *and for any* exponent; expansion of negative and fractional powers of a binomial; *determination of any term in the expansion of any power of a binomial; extraction of any root of a number approximately by the binomial theorem; definitions of convergent and divergent series*; the theorem of undetermined coefficients, with applications to the expansion of fractions, to the expansion of radicals, and to the separation of a fraction into partial fractions, when the denominator can be expressed as the product of factors of the first or second degree; permutations and combinations; *in the general theory of equations, — divisibility of equations; number of roots; formation of equations; composition of coefficients; depression of equations.*

<sup>1</sup> In 1898 and thereafter topics in italics will be replaced by a requirement of the principles and use of logarithms.

(Wells' Higher Algebra, edition of 1895, includes the subjects required.)

**In Solid Geometry:** The usual theorems contained in textbooks on solid geometry, with the exception of theorems relating to similar polyhedrons and regular polyhedrons. The application of the above to numerical examples in mensuration as follows, — lateral areas and volumes of regular prisms; surfaces and volumes of rectangular parallelepipeds; lateral edges, lateral areas and volumes of regular pyramids, and of frustums of regular pyramids; volumes of truncated triangular prisms; areas of spherical polygons; volumes of spherical pyramids; lateral areas, total areas and volumes of cylinders, cones, and frustums of cones; areas of zones; volumes of spherical sectors; areas and volumes of spheres; volumes of spherical segments. (Wells' Solid Geometry, revised edition, represents the requirement in this subject.)

*While the former requirement in Arithmetic has been discontinued, importance will be attached to accuracy in the numerical work of the papers in Algebra and Geometry. Familiarity with the Metric System is essential.*

The attention of teachers and applicants is particularly called to the necessity of thorough preparation in mathematics, not merely as to the extent and amount of work done, but as to its quality. Students should be thoroughly grounded in fundamental principles and definitions, and should be carefully guarded against the tendency to become mechanical in their mathematical work by disproportionate attention to mere dexterity in the solution of problems.

NOTE. — Applicants otherwise well prepared may, for the present, be admitted as special students without the advanced mathematical requirement, with the privilege of taking both subjects after entrance. This should be done, however, only in case the preparation stated is impracticable, and all such applicants are advised to make up these deficiencies by taking summer courses. (See page 57.)

**French.** — I. 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 personal; the partitive constructions; the inflection of the regular and of the more usual irregular verbs, such as *aller, dire, faire*, and of the classes represented by *ouvrir, sentir, venir, paraître, conduire*, and *craindre*.

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

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

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

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

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

**English.** — The requirements in English are those adopted by the Commission of Colleges in New England.

1. The candidate will be required to write in an hour, on some subject familiar to him, a short English composition, correct in spelling, punctuation, grammar, idiom, and division into paragraphs, and plain and natural in style. He will be judged by how well he writes, rather than by how much he writes.

2. The candidate will be tested in the correction of bad English, in punctuation, and in revision of incoherent or inelegant sentences. The aim in this will be to test the student's ability to criticise and to correct his own work.

3. The candidate is required to have some acquaintance with good literature, and the following works will serve as a basis both for the examination in this and for the test



in the writing of English. With these books the applicant must be familiar.<sup>1</sup> They are, however, divided into two classes. Those marked (*a*) are to be read, and the candidate will be required to show a general knowledge of their subject-matter, and of the lives of the authors. Those marked (*b*) are to be thoroughly studied, so that the candidate shall be able to pass an examination upon their subject-matter and structure.

For 1897: (*a*) Shakespeare's *As You Like It*; Defoe's *Journal of the Plague Year*; Irving's *Tales of a Traveller*; Hawthorne's *Twice Told Tales*; Longfellow's *Evangeline*; George Eliot's *Silas Marner*.

(*b*) Shakespeare's *Merchant of Venice*; Burke's *Speech on Conciliation with America*; Scott's *Marmion*; Macaulay's *Life of Samuel Johnson*.

For 1898: (*a*) Milton's *Paradise Lost*, Books I. and II.; Pope's *Iliad*, Books I. and XXII.; the *Sir Roger de Coverley Papers in the Spectator*; Goldsmith's *The Vicar of Wakefield*; Coleridge's *The Rime of the Ancient Mariner*; Southey's *Life of Nelson*; Carlyle's *Essay on Burns*; Lowell's *The Vision of Sir Launfal*; Hawthorne's *The House of the Seven Gables*.

(*b*) Shakespeare's *Macbeth*; Burke's *Speech on Conciliation with America*; De Quincey's *Flight of a Tartar Tribe*; Tennyson's *The Princess*.

For 1899: (*a*) Dryden's *Palamon and Arcite*; Pope's *Iliad*, Books I., VI., XXII., and XXIV.; the *Sir Roger de Coverley Papers in the Spectator*; Goldsmith's *The Vicar of Wakefield*; Coleridge's *The Rime of the Ancient Mariner*; De Quincey's *Flight of a Tartar Tribe*; Cooper's *The Last of the Mohicans*; Lowell's *The Vision of Sir Launfal*; Hawthorne's *The House of the Seven Gables*.

(*b*) Shakespeare's *Macbeth*; Milton's *Paradise Lost*, Books I. and II.; Burke's *Speech on Conciliation with America*; Carlyle's *Essay on Burns*.

For 1900: (*a*) Dryden's *Palamon and Arcite*; Pope's *Iliad*, Books I., VI., XXII., and XXIV.; the *Sir Roger de Coverley*

<sup>1</sup> These books may all be had in an inexpensive form. A list of publishers and net prices will be sent upon application to the Secretary of the Institute.

Papers in the Spectator; Goldsmith's The Vicar of Wakefield; Scott's Ivanhoe; De Quincey's Flight of a Tartar Tribe; Cooper's The Last of the Mohicans; Tennyson's The Princess; Lowell's The Vision of Sir Launfal.

(b) Shakespeare's Macbeth; Milton's Paradise Lost, Books I. and II.; Burke's Speech on Conciliation with America; Macaulay's Essays on Milton and Addison.

NOTE.—The standing in English will not be determined solely by the rank attained in the examination in that subject, but, in addition to this, it is expected that the paper in History and the translations from French and German will be written in correct and expressive English.

**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.

For United States History, either Johnston's History of the United States for Schools, or Fiske's History of the United States for Schools and Thomas's History of the United States, may suggest a satisfactory amount of preparation; for the study of Ancient History, Myers and Allen's Outlines of Ancient History is recommended but not prescribed.

It is not enough for the candidate to know merely the facts of history; he must show an understanding of the meaning of the facts and some knowledge of the relation of cause and effect in historical events.

#### 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 2. To be admitted to the first divided examination the candidate must be at least sixteen years of age, and must present a certificate from his teacher, stating that he is qualified in the subjects in which he applies to be examined.

For the first divided examination the candidate will be allowed the choice of any of the following five subjects, but no credit will be allowed on any of these unless at least three of the five are satisfactorily passed.



ical Drawing, as well as the Shopwork required in some of the engineering courses, and may thus gain time of much value for other purposes.

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.

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

In view of the increasing number of applicants passing examinations for advanced standing, the Faculty have arranged alternative studies for applicants able to pass off some of their first-year subjects: thus, for example, applicants passing more than the required work in modern languages may arrange to complete these so much earlier in their courses; those passing both Advanced Algebra and Solid Geometry may substitute second-year European History or Shop work, or special work in English or Chemistry; those anticipating Mechanical Drawing may do the same, or may, if prepared, take second-year Descriptive Geometry.

A special circular giving detailed information in regard to such alternative studies will be mailed on application.

*It is the intention of the Faculty to announce in the Catalogue for 1897-98 a series of elective subjects, of which one will be required for admission probably in 1898 and thereafter. This list is expected to include (1) Additional French or German; (2) Elementary Latin; (3) Elementary Physics; (4) Elementary Chemistry; (5) Mechanical Drawing and Shopwork. The object of this change is to secure greater breadth of preparatory training in subjects which are now recommended by the Faculty, and are generally studied by applicants preparing for the Institute. It is not intended that any school which now prepares applicants shall be unable to do so in consequence of the change, or that admission shall be postponed beyond the present average age of about eighteen and one-half years.*

*Pending the determination of further details, correspondence from schools interested will be carefully considered by the Faculty.*

#### ADMISSION TO ADVANCED STANDING.

To be admitted as a regular student in the second, third, or fourth year, the applicant must have attained the corresponding age (eighteen, nineteen, or twenty years, respectively), and must in general pass satisfactorily the examination for admission to the first-year's class, and examinations on all of the subjects given in the earlier years of the course which he desires to enter. The examinations for advanced standing are held at the time stated on page 2. (See pages 59 to 65 and pages 27 to 53.)

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

advanced standing in these courses shall have had considerable practice in Mechanical Drawing, and be familiar with the elements, at least, of Descriptive Geometry. Summer courses of appropriate scope are offered in these subjects. See page 57. (A special circular in regard to Opportunities for College Graduates will be mailed on applications.)

#### ADMISSION OF SPECIAL STUDENTS.

To be admitted to one or more selected subjects in any of the regular courses,—that is, to a partial or special course,—the applicant must have attained the age of seventeen years, and must give satisfactory evidence, by examination or otherwise, that he is qualified to pursue to advantage the subjects chosen.

By means of the Schedule of Topics of the Catalogue, the applicant may ascertain what the various subjects of study are, how, when, and by whom they are given, in what regular courses they are included, and the preparation required for each; but admission to special courses is dependent in all cases upon the approval of the Faculty. In general, no student will be allowed to take any one of these topics until he has proved his satisfactory knowledge of all 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 Geometry. Communications in regard to such substitution should be addressed to the Secretary of the Faculty.

TO TEACHERS AND TO PERSONS OF MATURE AGE ENGAGED IN TECHNICAL PURSUITS, wishing to devote some time to scientific study, the Institute desires to offer the amplest opportunities in its lecture-rooms and laboratories. Such persons may in general be admitted without formal examination, on satisfying the Faculty that they are qualified to undertake the work proposed. They will be expected after admission to attend the same exercises and examinations as other students. (For additional details, see circular on Courses for Teachers.)

## Requirements for Graduation.

---

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

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

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

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

## Subjects and Methods of Instruction.

---

INSTRUCTION is given by lectures and recitations, and by practical exercises in the field, the laboratories, and the drawing-rooms. A high value is set upon the educational effect of the latter, and such exercises form the foundation of each of the thirteen courses. 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. Besides oral examinations in connection with the ordinary exercises, written examinations are held from time to time. Near the close of the months of January and May general examinations are held. After the examinations the standing of the student in each distinct subject is reported to his parent or guardian. Reports of standing are based to a very large extent upon the quality of daily class-work. The January and May reports form the basis of admonition or advice from the Faculty in the case of students who are not profiting sufficiently by their connection with the school.

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

The three topics following are taken by all regular students: solid and spherical geometry or higher algebra;<sup>1</sup> logarithms and plane trigonometry; plane analytic geometry, including the equations and properties of the point, right line, and circle, and of the parabola, ellipse, and hyperbola. (A shorter course in this subject is given to students in certain non-mathematical courses.)

<sup>1</sup> See page 61.



Students in all the engineering courses receive instruction in the differential and integral calculus.

In addition to the above, the following topics are given in some courses: differential equations, with applications to problems in geometry; the theory of probability and method of least squares, including the adjustment of observations and the computation of probable errors.

As elective work, opportunities are afforded for the study of higher algebra and trigonometry, including De Moivre's theorem and its applications; the general theory of equations, with the solution of higher equations by methods of approximation; determinants; analytic geometry of three dimensions, including the equations and properties of the point, right line, and plane, of the sphere, cylinder, and cone, and of the paraboloids, ellipsoids, and hyperboloids; an advanced course in the calculus, including the theory of definite integrals; quaternions; Fourier's series.

**Drawing and Descriptive Geometry.**—Instruction is given to all regular students in the principles of Geometrical, Mechanical, and Freehand Drawing; and a large amount of time is devoted to practice in the drawing-room, to enable the student to acquire the skill necessary for his future work. Drawing is also continued in connection with the professional studies. All engineering students learn the elements of Descriptive Geometry in connection with their mechanical drawing, the exercises including recitations by small sections.

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

The instruction in Freehand Drawing includes an elementary course taken by all regular students, and more advanced work in the departments of Architecture, Biology, and Geology. For students in Architecture, the course includes the study of ornament and the human figure from

the cast and from life. Studies in charcoal are usually required, and opportunity is afforded for those who have made satisfactory progress to sketch in pencil, pen and ink, and with the brush. Importance is attached to drawing from memory and to rapidity of execution. Students in Biology and Geology pay special attention to specimen drawing.

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

**Chemistry.** — All regular students attend a course of lectures on Inorganic Chemistry, illustrated by experiments, and perform actual experimental work in the laboratory of general chemistry. The lectures are intended to prepare the student for his work in the laboratory, and to emphasize and co-ordinate the facts which he there learns. In the laboratory, the student receives instruction in chemical manipulation, and performs a series of experiments designed to illustrate the properties of the more important elements and the laws of chemical action. In connection with the lectures on inorganic chemistry, the elements of qualitative analysis and of theoretical chemistry are taught, and the student has practice in the solution of chemical problems. The study of chemical theory is continued in the chemical and other related courses by more advanced lectures and recitations, in which are presented the prevailing theoretical views as to chemical action, the constitution and classification of chemical compounds, as well as certain portions of molecular physics which bear directly upon chemical theories. A laboratory course of molecular weight determinations also constitutes a part of the instruction in chemical theory.

The instruction in Analytical Chemistry extends through two or more years. Each student is given a desk in the laboratory, which is open to him at all times. He receives personal instruction, and has analytical work assigned him, with particular reference to the course he is pursuing. This work is so arranged that he obtains experience in a

great variety of methods and processes, and is thus prepared to undertake any chemical analysis. The more industrious students, and those who work extra time in the laboratory, have the privilege of supplementing their regular laboratory course with special work and instruction. Special students may select any branch of analytical work for which they are qualified.

A special laboratory is fitted for volumetric analysis, where the students are taught to graduate and calibrate the various instruments of measurement. Instruction in this branch is given by a systematic course of lectures combined with laboratory practice, covering a considerable number of quantitative processes.

The facilities for gas analysis have recently been increased by the enlargement of the rooms devoted to this work and by the addition of much new apparatus. New laboratories have also been equipped for the chemical analysis of oils, and for the optical and chemical examination of sugars, starches, etc. The carefully arranged course of instruction in each of these subjects is designed to familiarize the student with the best methods of analysis, and to enable him to interpret intelligently the results of these analyses in their technical bearings.

The instruction in the laboratories 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, supplemented by occasional lectures, and special laboratories have been equipped for the purpose. Only those students are allowed to take this course who have successfully pursued, for one year, a course in general chemistry, with laboratory practice, followed by a year of qualitative and quantitative analysis. Some knowledge of general biology and bacteriology is also desirable. 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 methods of analysis, 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 which are delivered by persons actively employed in carrying out the processes which they describe. In the industrial laboratory, the students prepare chemical products from raw materials, and also undertake the preparation of pure chemicals. They are taught fractionation and distillation; and particular attention is paid to the preparation of dyes and mordants.

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

There are two courses in Organic Chemistry, — an elementary course of fifteen lectures given in the third year, preparatory to an extended course of sixty lectures in the fourth year. This later course treats of the properties, composition, and mode of formation of the more important organic compounds, and also of the modern theories of chemical composition and structure. It is very fully illustrated in the lecture-room by experiments.

The laboratory practice in organic chemistry comprises

the methods of ultimate analysis, followed by exercises in the preparation of a variety of typical organic substances and in original research. In connection with their laboratory work students are required to consult original articles bearing upon the subjects they are studying, and they thus acquire familiarity with chemical literature. Ample opportunities are afforded for the prosecution of investigations both in pure and applied chemistry.

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

(For further details, see the circular on Chemistry.)

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

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

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

**Physics.** — The instruction in Physics begins with an extended series of lectures attended by all regular students. 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 foreign languages. In connection with them, a Physical Colloquium is held, for which the students prepare and read before the class essays on some physical topic. These essays are written after a study of recently published papers and memoirs, and often embody also the results of experimental work by the student. They are intended to familiarize the class with current scientific literature, and to give experience in independent study and in the preparation and presentation of original scientific papers. This work is of particular advantage to those who intend to become teachers. Instruction is provided in photography and its applications, in microscopy, and in the use of the lantern as an instrument of demonstration in the lecture-room. A course of lectures and laboratory instruction is given in heat measurements, including pyrometry and fuel tests, and the course in electrical measurements and testing is undergoing continual extension. A course has also been instituted in modern physico-chemical methods, in which particular attention is given to the application of these methods to the various novel and important scientific problems of the present day in physical and electro-chemistry. A special laboratory is devoted to this purpose. All needful facilities are provided for original investigation in these branches of physics. Opportunity will be offered for more advanced instruction in mathematical and experimental physics to students who are competent to pursue such courses. During the coming year there will be given a series of lectures of this character devoted to the electro-magnetic theory of light.

(See also page 71 and the circular on Physics and Electrical Engineering.)

**The Rogers Laboratory of Physics.**—Regular students, excepting those in Architecture, enter upon a general course of experimental work in this laboratory either upon the conclusion of the lecture course in physics or earlier. The work is designed to strengthen the student's understanding of the laws of that science, and to impart to him a knowledge of the methods and instruments used in physical measurements, and

practice in the mathematical discussion of experimental results. The laboratory work consists almost exclusively of quantitative measurement. The earlier and simpler work serves chiefly to train the student in the use of methods or instruments which are employed as accessories later. This is succeeded by experiments on the mechanics of solids, liquids, and gases, each illustrating a method by which some physical law or constant is determined. Work in optics follows, and heat and electrical measurements occupy the remaining and more difficult part of the course. More advanced instruction is also provided.

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

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

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



**Theoretical and Applied Mechanics.** — In applied mechanics the subjects first treated are the composition and resolution of forces, the general laws of kinematics and dynamics mathematically discussed, the principles governing the determination of the stresses in the different members of trusses, centre of gravity, moment of inertia, and the ordinary principles of the strength of materials.

The more advanced instruction in this subject aims to familiarize the students with such data on the strength of materials used in construction as have been obtained by means of experiments, especially those made on a practical scale, in different parts of the world. Pains is taken to keep this work well up to date. This is followed in particular courses by the study of friction and lubrication, of continuous girders, of stone and iron arches, and of the theory of elasticity. Besides the above, the students have made during the school year 1895-96 the following tests in the laboratory: <sup>1</sup>—

Tests to determine the modulus of elasticity, the limit of elasticity and tensile strength of cast-iron, wrought-iron, and steel and aluminum rods and bars.

Tests of the deflections, and of the transverse strength of full-size iron or steel I-beams, and of wooden beams, subjected to transverse loads.

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

Tests to determine the shearing modulus of elasticity, and torsional strength of Norway and refined iron and steel bars one and one-half to two and one-half inches in diameter.

Tests of the tensile strength of hydraulic cement.

Tests of the compressive strength of hydraulic cement.

Tests of the strength of hemp and manila and sisal rope.

Tests of timber truss joints.

Tests of the tensile strength of bolted tension members, such as are used in iron building construction.

Tests of the compressive strength of wrought-iron pipe columns.

Tensile, torsional, and transverse tests on composition castings.

Torsional tests of small wire.

Tests of bolted joints (finished bolts and reamed holes).

<sup>1</sup> See page 93.

The instruction in Analytical Mechanics includes an advanced mathematical treatment of analytical statics, dynamics of a particle, dynamics of rigid bodies, etc., and requires acquaintance with considerable pure mathematics beyond the general courses in the calculus.

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

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

Students electing the geodetic option pursue these subjects in detail, taking also the course in the method of least squares, and receiving instruction in the adjustment of observations.

The course in Railroad Engineering treats of the survey, location, construction, and equipment of railroads. In addition to the work in the class-room, an actual railroad survey and location, several miles in length, are made each year upon such ground as shall best illustrate the problems occurring in practice; and the necessary maps and profiles are

prepared by the students. Advanced courses are given, in which the economics of railroad location are discussed; also the subjects of rolling-stock, motive power, train resistance, brakes, signals, yards, stations, tunnels, and street railways of various kinds. The work in the class-room is supplemented by designs, made in the drawing-room, and by visits to work in progress of construction. Railroad administration and management form the subject-matter of a distinct course.

The work in Road or Highway Engineering embraces the location, construction, and maintenance of town and county roads, and of city streets and pavements. The facilities for instruction in this branch are ample, and the equipment of the department, in books, models, apparatus, and drawings, is constantly increasing. The laboratory is equipped with apparatus by which the suitability of various materials for the purposes of road or pavement construction may be ascertained.

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 hydraulic measurements, in which the student is instructed in the methods of gauging the flow of streams, with work 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 exercises, given partly by text-book and partly by lectures, covering the subjects of hydrology, water-supply, water-power, hydraulic motors, and irrigation.

In the course in Sanitary Engineering the object sought is to prepare the student to deal intelligently with certain questions relating to the health of individuals and communities, and to plan works of sewerage and drainage. The course

embraces the study in detail of the house, with its apparatus, the disposal of sewage for isolated buildings by surface or sub-surface irrigation, the collection and removal of sewage in the larger towns, and the sanitary drainage of cities. Frequent opportunities are given for the inspection of actual examples of sanitary engineering, and the work in the classroom is supplemented by exercises in designing. The students also attend lectures and demonstrations in sanitary science.

The course in the Strength and Stability of Structures embraces a study of the methods of proportioning beams, floors, columns, roofs, bridges, piers and abutments, arches, retaining walls, and similar structures. Both the analytical and graphical methods of investigating the strength and stability of structures are taught. The course in Bridges and Roofs involves an extended study of the different structures of this class, of wood, stone, and metal, with reference to economy of material, methods of proportioning parts, and the details of design. The subject of foundations is also included. In connection with these courses the student is required in the drawing-room to make complete designs and working drawings, with blue-prints, for several structures.

By the kindness of many active members of the profession, and especially during the past year through the courtesy of Mr. Lucius Tuttle, President of the Boston and Maine Railroad, and of Mr. D. H. Andrews, proprietor of the Boston Bridge Works, the classes are frequently enabled to inspect engineering works of interest, and to carry on field operations in favorable localities.

In addition to the regular lectures of the school, occasional lectures are given by prominent engineers, in active practice in their profession, upon subjects with which they are especially familiar. During the past year lectures have been given by Mr. George W. Blodgett, Electrician of the Boston and Albany Railroad, on the Application of Electricity to Railway Working; by Mr. Allen Hazen, on Filtration of Public Water Supplies.

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

The department has also a collection of models illustrating bridge details, problems in stone cutting, etc., and a set of full-size models of various types of road and pavement construction, for use in connection with the work of instruction. It has also a large collection of blue-prints, drawings, and photographs.

In order to provide for the needs of students wishing to pursue graduate courses of study, leading, if desired, to advanced degrees (see page 54), an advanced course has been laid out, which includes, besides original work in research and criticism, further instruction in the design and construction of bridges, buildings, and other structures, in theoretical hydraulics, and in the theory of elasticity, with special reference to its applications to the strength of materials, together with experimental work in the engineering laboratories.

(For additional details, see the circular on Civil Engineering.)

**Summer Course in Topography, Geodesy, Hydraulics, and Geology.** — In the vacation following the third year, students taking the geodetic option are required to attend a course in topography, geodesy, hydraulics, and geology, during four to six weeks in the early part of the summer. This is held at some convenient and suitable point in the country, and its object is to give the students opportunity for more extended

and continuous field practice in these branches than is possible during the term. The work done consists of a topographical survey of a certain district, with field practice in geodesy and geology and in the measurement of the flow of streams and in tidal observations. 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.

In 1894 and 1895, this school was held in the Adirondack Mountains; in 1896 it was held at Machias, on the coast of Maine.

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

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

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

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

The main principles of hydraulics and of hydraulic motors are studied with particular attention to the turbine.

The course in Locomotive Engineering begins with a careful study of the details of the more usual types of locomotives, and of the strength of the more important parts. The following topics, among others, are discussed, — train resistance, brakes, heating by steam from the locomotive, compound locomotives. The course in Marine Engineering includes a detailed study of the design and construction of single, compound, and multiple-expansion marine engines, with a discussion of their form, proportions, and efficiency, as well as of the strength of the several parts. Mill Construction is studied together with the processes to be carried out in a cotton mill, so far as to enable the student to take up intelligently the laying out of machinery to best advantage, including the planning of the power plant and the distribution of power, all leading up to the designing and building of the mill itself.

The laboratory work, in its earlier portions, is devoted to giving the student a drill in such experimental work as a mechanical engineer has constantly to perform, such as boiler and engine tests, etc. The later work takes very largely the form of original research; and it is intended that the students in these laboratories shall, under suitable direction, undertake the experimental investigation of a number of important engineering problems. (See page 93.)

In connection with the course in mechanism, practice is given in making working drawings of parts of machinery from measurements, and other drawings illustrating the class-room work. In connection with thermodynamics, detail drawings are made from measurement of some ma-

chine, and from these, assembly drawings. This is followed by practice in boiler drawing and in the working out of valve gears and mechanism designs.

Lectures are also given to the students of Mechanical Engineering on Industrial Management.

Besides the teaching by the regular corps of instructors, lectures upon special subjects are given by gentlemen actively engaged in the profession. During the past school year, one or more lectures were given, by Mr. F. H. Boyer, on Refrigerating Machinery; by Mr. Desmond FitzGerald, on Certain Features of the Boston Water Works; and by Mr. S. M. Vauclain, on the Compound Locomotive. The students of the department were enabled to attend also a course of lectures by Mr. Odin B. Roberts, on the Relation of Patent Law to Engineering.

(For additional details, see the circular on Mechanical Engineering.)

**Naval Architecture.** — The special work of the course is given by lectures, recitations, and drawing. The subjects treated in the lectures and recitations are as follows: —

Description of the methods of building ships in iron and steel, including transverse and longitudinal framing, and the fitting of ballast tanks and double bottoms; preparing the ground, laying blocks, and erecting scaffolding; the laying out, bending, and erection of the framing and the application of the shell plating; the fitting of decks, hatches, and bulkheads; launching and docking.

General discussion of the properties of floating bodies, with special application to ships. Statical and dynamical stability of ships and curves of statical and dynamical stability, with examples of such curves for special types of ships. Discussion of the effect of carrying fluids in tanks wholly or partially filled; and of the effect of filling compartments of a ship. Reserve of stability, or the effect of sudden forces, — such as gusts or squalls of wind, — on the safety of a ship when under sail.



Methods of finding statical and dynamical stability by Barnes' method and by the method of cross-curves. Methods of finding the weight and centre of gravity of hull, equipment, and cargo. Determination of the loads, shearing forces, and bending moments acting on the hull of a ship in still water and when borne by waves. Determination of the equivalent girder and the stresses on the hull of a ship.

Rolling of ship in an unresisting medium, in water, and among waves. The trochoidal theory of waves, and the theory of waves of translation. Waves made by ships and the effect of such waves on the propulsion of ships. Resistance of ships due to friction, wave-making, eddy-making, and to the effect of the wind on hull and rigging. Experiments on the resistance of ships by towing and otherwise. Effect of the propeller on the resistance of a ship. Propulsion of ships by steam or sails. Steering and manœuvring a ship.

Methods of procedure for laying out the preliminary design of a ship for a given purpose. Methods of carrying out and completing a design.

Heating and ventilation, and drainage of ships.

Adjustment of compasses.

The drawing-room work is as follows: —

Laying out and fairing the lines of a ship. Making a displacement sheet in the ordinary form. Drawing curves of displacement, tons per inch of immersion, centre of gravity, centre of buoyancy, areas of water-line, and transverse metacentre.

Calculation of statical and dynamical stability by Barnes' method and the method in use at the Bureau of Construction and Repair of the Navy Department. Calculation of the weight and centre of gravity of the hull, equipment, and cargo. Calculation of trim of a ship, with and without cargo. Calculation of the stresses on the hull in still water and when borne by waves.

Designing and laying out the lines of a ship for a given service. Drawing the midship section of a ship, the general deck plans, etc. Getting out the specifications for the scantlings.

The drawing-room work is carried on progressively, as applied to some ship or ships of good modern design, and is of a scope to give familiarity with all the methods and processes used for the complete design of a ship and the determination of her properties. Finally, the design of a ship is begun and carried far enough to exhibit the methods of designing; calculations and processes which the student has already mastered, and which must be familiar before a design can be intelligently begun, are carried only so far as is required to get the design into shape. Full advantage is taken of the use of mechanical integrators, of which the department has a good supply, to reduce the time and labor of calculations.

The department has a good collection of standard and recent works on naval architecture and marine engineering. There is, further, in the possession of the department a large number of drawings of modern ships and marine engines of various types for naval and merchant service; including complete sets of drawings of several steamships, with their propelling machinery, both naval and merchant, of large size and of the most recent and approved design and construction. Much of this material is worked up in such form that it can be used directly in the work of the classes; in fact, the work as detailed could be carried out only by aid of such material.

(For additional details, see the circular on Naval Architecture.)

**Electrical Engineering.** — As a foundation for subsequent work, instruction is given in the theory of electricity. An extended course of lectures is devoted to the detailed consideration of the various technical applications of electricity to land and submarine telegraphy, the telephone, electric lighting, and the electrical generation, transmission, and utilization 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.

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

Mr. George W. Blodgett, Electrician of the Boston and Albany Railroad, on the Application of Electricity to Railway Signalling; Mr. Hammond V. Hayes, Electrical Engineer of the American Bell Telephone Co., on Telephone Engineering; Mr. C. J. H. Woodbury, of the American Bell Telephone Co., on Electricity in its Relation to Fire Risks; Mr. J. P. B. Fiske, of the General Electric Co., on the application of Electricity to Railway Transportation; Mr. Louis Bell, on the Electrical Transmission of Power; Mr. Henry M. Hobart, of the General Electric Co., on the Designing of Dynamos; Mr. Walter S. Moody, of the General Electric Co., on Alternating Current Apparatus; Mr. S. Everett Doane, of the General Electric Co., on the Manufacture of Incandescent Lamps; Mr. Hollis French, on Electrical Engineering Practice and Specifications; Mr. Howard C. Forbes, on the Design and Testing of Electric Light and Power Plants; and Mr. Odin B. Roberts, on the Nature and Function of Patents for Inventions.

The equipment of the laboratory includes a large number of dynamos and motors of various types and sizes, both alternating and direct current, which are wholly available for purposes of instruction.

Among these are the following: An Edison shunt generator, having a capacity of 96 amperes at a pressure of 110 volts; a Thomson-Houston inclined coil constant potential generator, having a capacity of 120 amperes at 110 volts; a Westinghouse multipolar compound generator, having a capacity of

180 amperes at 110 volts, a Weston shunt generator, having a capacity of 60 amperes at 70 volts; a Thomson-Houston alternating-current generator, having a capacity of 30 amperes at 1000 volts, with transformers of various patterns and sizes up to 15 kilowatts; a Brush arc-light generator, having a capacity of 10 amperes at 1500 volts; an experimental three-phase low-pressure alternating-current generator, having a capacity of about 15 kilowatts at 500 volts; a Westinghouse shunt generator for electrolytic work, having a capacity of 300 amperes at 15 volts; a General Electric compound bipolar generator, having a capacity of 25 amperes at 125 volts; a Westinghouse 10-horse-power generator arranged for use either as a 120-volt direct-current generator or motor, or as a quarter-phase alternating-current generator or motor, or as a rotary transformer; a 220-volt  $7\frac{1}{2}$ -horse-power Thomson-Houston shunt motor; a 7-horse-power 500-volt three-phase alternating-current motor; several 15-horse-power 500-volt Thomson-Houston and Edison street railway motors, and a large number of small direct and alternating-current dynamos and motors of various sizes up to 5-horse power. A 500-light United States direct-current compound dynamo is used for lighting the Engineering Building, and is available for purposes of instruction. A 15-kilowatt Thomson welding coil has recently been added to the laboratory furnishing current up to 3000 amperes if required.

During the past autumn a new and separate plant has been installed for use in regular laboratory instruction, in connection with the course in Dynamo Testing and Dynamo-Electric Measurements. It consists of two similar four-pole moderate-speed 25-kilowatt direct-current compound generators made by the General Electric Co. They are belt-driven from a special Westinghouse compound engine fitted with indicators, and with a surface condenser discharging the condensed steam into weighing-tanks.

The switchboard is so designed that the dynamos can be put in series or parallel or connected in any special manner called for by the requirements of particular methods of testing

the efficiency, or studying the losses, either of the dynamos alone or in connection with the engine. A number of Weston illuminated dial ammeters and voltmeters of suitable ranges constitute a part of the equipment. They are provided with flexible lead wires, and so arranged as to be readily connected as may be necessary to meet the requirements of the ordinary commercial methods as well as the more refined electrical methods of testing efficiency.

**Chemical Engineering.** — The special instruction upon this subject begins with an extended descriptive course of lectures giving a general view of Industrial Chemistry. Chemical questions connected with various industries are discussed, and mechanical appliances described. Details of construction are reserved for a subsequent course dealing with materials, methods of transportation, evaporation and distillation, refrigeration, furnace construction, and similar topics. These topics are, so far as possible, taught by persons practically connected with the industries of which they treat. Special attention is paid to the discussion of the engineering problems of combustion, fuels, evaporation, boiler corrosion, etc., from a chemical point of view. The machinery and mechanical appliances used in manufacturing chemistry are also discussed at length from a purely engineering standpoint. Heat measurements and the economic use of fuels are considered in separate courses of lectures. A laboratory course of instruction is given in technical gas analysis, including the collection and analysis of furnace and illuminating gases, and another in the chemical and mechanical testing of oils. The instruction in applied chemistry of the fourth year of the course includes the use of text and reference books in both French and German. The student gains thereby a working knowledge of the technical vocabulary, and is enabled to consult literature in these languages relating to patents. Students in this course have also practice in the preparation of chemicals on a semi-industrial scale in the laboratory of in-

dustrial chemistry. Excursions are frequently made to various manufacturing establishments in Boston and vicinity.

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

These laboratories are situated in the Engineering Building, where they occupy the two lower floors, 50 × 150 feet each. The laboratory for testing the strength of materials is furnished with the following apparatus, — a testing-machine of one hundred thousand pounds capacity and another of fifty thousand pounds capacity for determining tensile strength, elasticity, and compressive strength; a testing machine of one hundred thousand pounds capacity for determining the transverse strength and stiffness of beams up to twenty-five feet in length, of framing-joints used in practice, and of other structures subjected to a transverse load; a testing-machine of eighteen thousand pounds capacity for determining the transverse strength and stiffness of beams up to fourteen feet in length; apparatus for testing the strength of full-size masonry arches, a machine for testing the torsional strength and stiffness of shafting up to three inches in diameter and to twenty-one feet in length; a small torsion-machine of six thousand inch-pounds capacity, for very delicate work; machinery for the measurement of the twist of shafting; for testing the tensile strength of mortars and cements, and of ropes; for testing the effect of repeated stresses upon the elasticity and strength of iron and steel; for determining the strength and elasticity of wire; for determining the strength and elasticity of cloth; for testing the strength of pipe and pipe-fittings under hydraulic pressure; also accessory apparatus for measuring stretch, deflection, and twist. Besides the above-stated apparatus, a horizontal Emery test-

ing-machine of three hundred thousand pounds capacity forms a part of the equipment of this laboratory. It contains all the essential features of the eight hundred thousand pound testing-machine at the Watertown arsenal, built by Lieut. Albert H. Emery, and is suitable for testing a compression specimen eighteen feet long, and a tension specimen twelve feet long.

The Hydraulic Laboratory contains a closed steel tank five feet in diameter and over twenty-seven feet high, arranged for the insertion of orifices, mouthpieces, and other special pieces of apparatus, with gates for controlling the discharge, and with connections for supplying water, in experiments upon pipes and motors. This tank is connected with a ten-inch standpipe over seventy feet high, so arranged that a constant head may be maintained at any desired level. Two steel tanks, each of about two hundred and eighty cubic feet capacity, give opportunity for the accurate measurement of larger quantities of water than can be weighed directly during experiments. A system of pipes connected both with the main tank and with the pumps is arranged for the insertion of diaphragms, branches, and other apparatus for studying loss of head and the laws of discharge. An attachment has been fitted to the main tank, containing a Pitot tube for studying the laws of velocity in jets, and adjustable points for accurate measurement of the cross-section of jets.

The laboratory is further equipped with a forty-eight inch Pelton wheel, of thirty horse-power; a Venturi meter; an eight-inch, a twelve-inch, and two forty-eight-inch weirs for measuring water, also an orifice-tank for the same purpose; a centrifugal pump; a rotary pump; a plunger-pump; a pulsometer; a three-inch water meter and others of smaller size, and a variety of mercury gauges, standard orifices, mouthpieces, diaphragms, branches, nozzles, etc., for experiments with flowing water under all conditions. A six-inch turbine is arranged to be run under various conditions of head and gate opening in tests for efficiency. There is also a hydraulic

ram with a two and one-half inch drive-pipe. The laboratory also contains a steel weir-box, the weir having a standard crest adjustable as to length from zero to five feet; and a seconds pendulum, with chronograph, for exact determination of time in experimental work. Water is directly supplied for experiments by the various pumps.

The Steam Laboratory contains a triple-expansion engine, with cylinders of nine inches, sixteen inches, and twenty-four inches diameter respectively, and thirty inches stroke, arranged in such a way as to be run single, compound, or triple, as desired for the purposes of experiment. This engine is of the Corliss type, and has a capacity of about one hundred and fifty horse-power when running triple, with an initial pressure of one hundred and fifty pounds in the high-pressure cylinder. It is connected with a surface condenser and the other apparatus necessary to adapt it to the purposes of accurate experiment.

This laboratory also contains a sixteen horse-power engine, and an eight horse-power engine, used for giving instruction in valve setting, etc., also a thirty-six horse-power gas-engine and a small gas-engine. It is equipped with several surface condensers, steam-pumps, injectors and ejectors, 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 steam-engine indicators; apparatus for testing injectors; and with indicators, planimeters, gauges, thermometers, anemometers, and other accessory apparatus.

The engineering laboratories are provided with a number of friction brakes; with machinery for determining the tension required in a belt or rope to enable it to carry a given power, at a given speed, with no more than a given amount of slip; with four transmission dynamometers; with two machines for determining the coefficient of friction of lubricating oils; with a pendulum governor arranged for experimental purposes; with a complete set of Westinghouse air-brake apparatus, including the parts belonging to the car and to



the locomotive; with the pump and engineer's valve of the New York air-brake; with a locomotive link model; with a hot-air engine; and with cotton machinery as follows, — two cards, a drawing-frame, a speeder, a fly-frame, a ring spinning-frame, and a mule, as well as accessory apparatus. There are available for the purposes of experiment in connection with the work of these laboratories, two horizontal tubular boilers in a boiler-house near the Engineering Building, a wrought-iron stack, 3 feet in diameter and 100 feet high, fitted with the apparatus necessary to make experiments on the draught of chimneys; a horizontal tubular boiler, and two large sectional boilers situated in the Rogers Building; also another boiler, a forty horse-power engine, a number of looms, and other apparatus in the workshops on Garrison Street.

**Shopwork.** — Practical instruction in the nature of the materials of construction, and in the typical operations involved in the arts, is considered a very valuable adjunct to the theoretical treatment of professional subjects. Workshops have been provided with the more important hand and machine tools, so that the student may acquire a direct knowledge of the nature of metals and woods, some manual skill in the use of tools, and a thorough knowledge of what can be accomplished with them. The shops are located on Garrison Street, and are equipped as follows: —

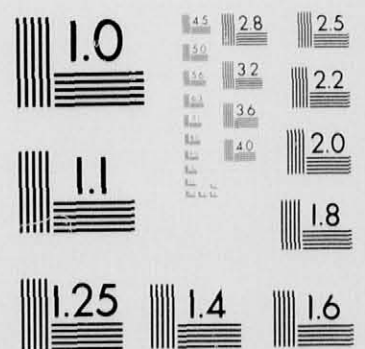
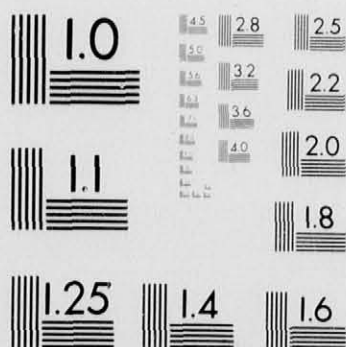
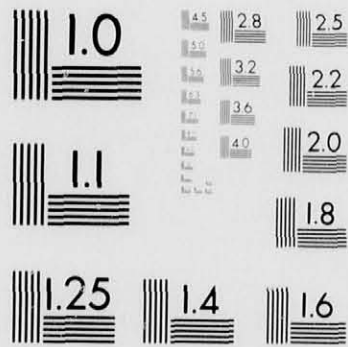
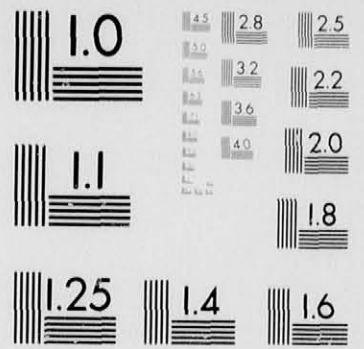
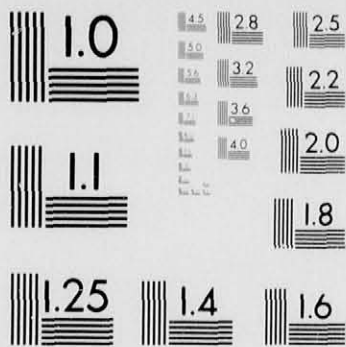
The carpentry, wood-turning, and pattern-making departments contain forty carpenter's benches, two circular saw-benches, a swing-saw, two jig-saws, a buzz-planer, a mortising-machine, thirty-six wood-lathes, a large pattern-maker's lathe, and thirty-six pattern-maker's benches. The foundry contains a cupola furnace for melting iron, two brass furnaces, a core-oven, and thirty-two moulder's benches. The forge-shop contains thirty-two forges, seven blacksmith's vises, and one blacksmith's hand-drill. The machine-shop contains twenty-three engine-lathes and seventeen hand lathes of approved patterns, two machine-drills, three

planers, a shaping-machine, two universal milling-machines furnished with spiral and gear-cutting attachments, a universal grinding-machine, a cutter and reamer-grinder, thirty-two vise-benches arranged for instruction in vise-work, a twenty-four inch standard measuring-machine and a fully equipped tool-room.

**The Engineering Library.** — The libraries of the departments of Mechanical Engineering, Civil Engineering, and Naval Architecture are united into a single library under the direct charge of the Librarian. This library contains over six thousand volumes and twenty-seven hundred pamphlets. It is especially rich in journals and transactions of societies dealing with the various branches of engineering and ship building. One hundred and twenty-four publications of this kind are received annually.

**Mining Engineering and Metallurgy.** — Professional instruction is given by lectures and recitations, by laboratory work, and in the summer school. The introductory work begins with Plattner's blow-pipe assay of silver. This is followed by a detailed treatment of technical methods of mining, including prospecting, sinking, stoping, hoisting, pumping, and ventilating, the location of mining claims, and mining surveying. Ore dressing is taught by lectures and by laboratory work illustrating the various forms of machinery, while the lectures on metallurgy are supplemented by an extended course in the use of the furnaces in the laboratory for the smelting of gold, silver, copper, and lead. By this laboratory work the student has experience in actual metallurgical work, and checks his results by assays and chemical analyses at the appropriate stages of the process. With such practical experience in immediate connection with classroom instruction, he acquires the best possible grasp of the subject-matter.

**The John Cummings Laboratory of Mining Engineering and Metallurgy.** — The aim of this laboratory is to furnish students the means for experimental study of the various processes of



M. I. T. ANNUAL CATALOGUES AND BULLETINS

1896/97

02 OF 04

ore dressing and smelting, and at the same time to give them an idea of what is required of a professional miner or metallurgist. To this end the apparatus has been chosen with a view to illustrating, as far as possible, the principles of the more important machines and furnaces actually used in mining and metallurgy.

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

The experimental work of the laboratory is carried on by the students, under the immediate charge of an instructor. A sufficiently large quantity of ore is assigned to each student, who first examines it for its component minerals, sorts and samples it, determines its character and value by analysis and assay, and makes such other preliminary examinations as serve to indicate the proper method of treatment. He then treats the given quantity, makes a careful examination of the products of each step of the process, ascertains, wherever practicable, the amount of power, water, chemicals, fuel, and labor expended, and thus learns approximately the effectiveness and economy of the method adopted. He learns also the value of chemistry as a check upon metallurgical work. Each student is assisted in working his ore by his classmates, who have opportunity in turn to manage the machines and furnaces.

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

The laboratory consists of three parts, devoted respectively to milling, smelting, and assaying. There are also a supply-

room, a blow-pipe room, library, a private laboratory and office. Ample storage vaults for ores and fuel are provided.

The Milling-room is supplied with five suites of milling apparatus, as follows, — a three-stamp battery, with a Hendy automatic feeder, a set of amalgamating plates, a mercury-saver, a Frue vanner with smooth and corrugated belts for concentrating tailings, a centrifugal pump for reworking the tails of the vanner upon the circular slime-table, a settling-tank, and a centrifugal pump; a Blake Challenge crusher, a Gates crusher, crushing-rolls, with automatic sizing-screens, a Richards-Coggin separator, a spitzlutte, a spitzkasten, a small-sized plant consisting of sizing-screens, spitzlutte, small three-sieve Harz jig and Gilpin-county bumping-table; two Collom jigs, a Cornish frame, a circular slime-table, a settling-tank, a centrifugal pump, and a magnetic concentrator; one set of three amalgamating pans, thirty, eighteen, and twelve inches in diameter, respectively, together with a thirty-inch settler, another set of seven seven-inch pans, three of which are copper, and a small automatic kieve for separating mercury from pulp; a set of three forty-gallon leaching-vessels, a set of four eight-gallon leaching-vessels, and two dynamos for deposition of metals.

In addition to the suites of milling apparatus there are independent experimental machines, such as a spitzlutte for accurate sorting, an adjustable glass table for accurate table-sizing, and a glass spitzkasten for the study of water currents.

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

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

The Assay-room contains ten crucible furnaces, 12 × 12,

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

The Library contains over fifteen hundred volumes, and receives annually thirty-seven periodicals.

**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.

At the summer school of mines, the students with their instructors locate at a mine, and take up in succession systematic studies in methods of mining and ore dressing, of underground and surface surveying, doing actual work in all these lines.

At the summer school of metallurgy, the party visits a locality where a variety of smelting and refining operations are conducted, and makes a systematic study of the different operations, writing up the notes from day to day.

In 1893, the summer school of metallurgy was held at Chicago. The Exposition and the smelting-works for treating iron, copper, silver, and gold, were visited on alternate days.

In 1894, the summer school of mining was held in Nova Scotia and Cape Breton. In the former district, the mining and milling of gold were studied; in the latter the mining and shipping of coal.

In 1895, the summer school of metallurgy was held in New Jersey and Pennsylvania. The leading metallurgical works of Jersey City and Newark, N. J., and those at Lebanon, Steelton, Everett, and Johnstown, Pa., were made the objects of study. Coal and iron mines were visited in Everett and Lebanon, Pa.

In 1896, the summer school of mining was held in the Upper Peninsula of Michigan and in Minnesota. The leading

iron mines of the Menominee, Gogebic and Mesabi ranges were visited, and their geological features, as well as the surface and under-ground workings, carefully studied.

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

**Architecture.**— The instruction in this department comprises the study of construction and materials, the study of building processes and of professional practice, as well as that of composition, design, and the history of architecture. It is arranged to meet the needs of those who are commencing their professional studies as well as 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 history and applications of the orders. During the entire course there is regular instruction in freehand drawing, the last year being from life. The students are familiarized with the material elements of their future work by courses in practical construction, including lectures, problems, and visits to buildings.

Architectural history is taught by lectures, illustrated with the stereopticon, by text-books, and by written themes.

For two and one-half years the students are continually engaged upon architectural design. Each student's work is examined and criticised before the classes by a jury from the Boston Society of Architects.

Advanced courses in design, history, and construction are offered to graduates of the regular course.

Several thousand photographs, prints, drawings, and casts were originally collected for the department, by means of a special fund raised for the purpose. To these collections large additions have been made by regular appropriations and by gifts. 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 de-



posited in the Museum of Fine Arts, and is arranged with the architectural collections belonging to the museum. The students of the department have free access to the museum at all times; as the building is close at hand, no inconvenience results from the change, and some of the advanced exercises in drawing are held there. The architectural library contains a carefully selected collection of seven thousand photographs, and over sixteen hundred volumes of technical works, and the leading American and foreign periodicals. The publications of the Royal Institute of British Architects and of the Société Centrale des Architectes in Paris are presented by those institutions, and a large number of richly illustrated and costly books have been added to the library recently as gifts from friends of the Institute. The resources of the department have been much enlarged by the erection of the Architectural Building, which contains more than double the space previously available.

The Boston Society of Architects has established prizes of the value of fifty dollars each in books for the two students who shall exhibit the best work at the completion of their courses. Messrs. W. R. Ware, R. D. Andrews, and C. H. Walker form the committee appointed this year to examine the work, make the award, and report at the next October meeting.

The two Rotch prizes of two hundred dollars each are now available, and, according to the will of Mr. Arthur Rotch, one is to be given to the student who shall be graduated highest in his class in the full regular course in architecture, and the other to the special student who shall rank highest at the end of a two-year course. For this special student prize only those applicants are eligible who enter in accordance with the requirements on page 34, on the basis of professional office experience or as college graduates.

**Summer School of Architecture.** — The first summer school was held in Chicago in 1893.

In 1894, the school was held in Salem and Portsmouth for

the study of colonial work. The courtesy of owners of houses built at this epoch allowed the students to measure and sketch the best work of this interesting locality.

In 1895, the study of colonial architecture was continued, the class having headquarters at Plummer Hall, Salem. A large number of measured drawings were made.

In 1896, an important change was made, the school, numbering twenty students, taking a fifty-days' bicycle tour through the south of England, Normandy, and Touraine. Many sketches and photographs were made, and much information gathered in regard to the different European styles of architecture.

**Biology.** — Under this head is included instruction in a series of related subjects, beginning with microscopy and general biology, and extending to comparative physiology, zoölogy, bacteriology, and industrial and sanitary biology.

General Biology is taught partly as an introduction to the special branches of the subject, which depend more or less upon it, and partly for its own sake, as introducing the student to a new department of science. Beginning with a brief review of the familiar facts of common knowledge concerning living things and lifeless things, their likeness and their difference, and of organisms, organs and tissues, the more recondite subjects of cells and protoplasm are considered; after which considerable time is spent upon a thorough examination and comparison, both macroscopic and microscopic, of selected plants and animals, chosen as representative forms.

**Botany and Zoölogy.** — General biology is succeeded and continued by brief courses in general zoölogy and general botany. These naturally introduce the student to cryptogamic botany, of which the outlines only are taught, and to more advanced zoölogy, in which larger opportunities are offered.

**Comparative Anatomy and Embryology.** — The student makes careful dissections and drawings of typical forms from

most of the principal groups of the animal kingdom, the last six weeks of the course being devoted to the study of the embryology of vertebrates, with the embryo chick and the frog as types. This course is indispensable to those who intend to teach zoölogy, while those intending to study medicine will find that a knowledge of the anatomy and development of vertebrates, together with the skill in dissection and embryological methods acquired in this course, will give them a great advantage during their earlier years in the medical school.

Theoretical Biology. — The more philosophical questions connected with biology are brought forward and treated historically and critically. The facts and theories are examined in regard to such subjects as heredity, evolution, natural selection, variation, etc.

Comparative Physiology. — For those intending to study medicine, or to become science teachers in secondary schools, the course in physiology (and microscopic anatomy) is especially useful, emphasizing as it does the broader aspects of the subject without encumbering the student with the many details which must form part of a course in human physiology given with sole reference to the medical or other special applications of the science.

Bacteriology, Fermentation, Sanitary Science, etc. — Those who are preparing themselves for work in some one of the sanitary or industrial applications of biology, give special attention to bacteriology, especially in its latest application to sanitary science in the examination of air, ice, and water, and its industrial applications in dairying, vinegar making, food preserving, etc. The organisms peculiar to or infesting water-works are particularly considered, owing to their practical importance.

Advanced students in biology devote most of their time to special work, in which they are allowed considerable choice, and they are expected to undertake original observations in their respective specialties. The subjects offered at present for specialization are comparative physiology (including micro-

scopic anatomy) and micro-biology (including bacteriology, industrial biology, and sanitary biology).

The Institute as a whole now affords unusual opportunities for advanced or special work in fermentation, hygiene, and sanitary science. The departments giving the principal instruction in these subjects are the biological, chemical, physical, architectural, and that of sanitary engineering. Graduate or special students, such as physicians, inspectors of boards of health, superintendents or other attachés of water-works or sewer departments of cities or towns, or persons engaged in industries depending on the activities of yeast, bacteria, etc., if qualified to pursue their work with advantage, will be admitted to such subjects as they may elect, and will be given every opportunity to equip themselves for their work.

**The Biological Laboratory** is furnished with tables for microscopical work, for dissection, and for the simpler operations of physiological chemistry; it is well supplied with microscopes, paraffin baths, Thoma and Minot microtomes, incandescent gas-burners, incubators, and other apparatus for work in gross and microscopical anatomy and embryology. For work in experimental physiology, there are four kymographs, a pendulum myograph, Du Bois Reymond induction coils, muscle forceps and levers, recording drums, moist chambers, tambours, etc. For work in bacteriology and sanitary science, there are culture-rooms, sterilizers, thermostats, special microscopes, and other bacteriological and microscopical apparatus.

The Biological Library includes the ordinary text-books and works of reference, and many important monographs, containing in all more than sixteen hundred volumes.

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

which the museum, the library, etc., are freely accessible. (A special circular giving more detailed information concerning the biological department may be had on application.)

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

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

**Geology, including Physical Geography.**— The geological studies are introduced by a course in physical geography which embraces dynamical geology.

**Physical Geography.**— The course differs widely from those usually given in this branch in secondary schools, not only in its more advanced character but likewise in the method of treatment which renders it especially adapted to students in a technological institution. The operations of the great terrestrial forces are so studied that the student acquires a knowledge of the way in which they work and of the physical results which they produce. He is thus led to the consideration which they should receive when it is desired to utilize their power or to evade their destructive influence. In this way the study of the operations of the sea, of the streams, of the atmosphere, and even of the earthquakes and volcanoes, acquires a practical as well as a scientific value. The course includes the study of physiography, revealing the processes

by which the earth acquires its topographic and hydrographic features, and leads the student to an intelligent consideration of the influence which the physical changes of the earth's surface have upon the permanence of works of internal improvement.

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

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

Historical Geology, Stratigraphical Geology. — The physical history of the earth is the subject for study in each of these two courses, but in the selection of topics and in their presentation they are each adapted to the needs of the students to whom they are given. The course in stratigraphic geology is for students in the department of Civil Engineering, and prominence is given to the development and significance of the physical features of the surface. In historical geology a

larger amount of time is devoted to the past life of the earth as antecedent to existing species. The students are taught how the geologic events determined the structures and features of existing lands, and that it is through these that we ascertain the causes of the distribution and modes of occurrence of mineral productions, of soils, and of living species. The testimonies of geology upon the doctrine of evolution, and the geologic events which constitute a part of the earliest history of human life upon the earth, are taught in these courses. The courses are illustrated by the use of specimens, maps, diagrams, and lantern projections.

The courses in Ore Deposits and Economic Geology are based upon extensive special collections, and are designed to prepare the students in Geology for professional work in connection with mines and quarries, including the selection and testing of materials for structural purposes and for industrial processes. In addition to frequent field-lessons during term time, students in these courses spend about ten days of the semi-annual vacation with an instructor in some mining district, making a practical study of the modes of occurrence and structural relations of the economic materials, as well as of the methods of mining, etc.

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

**The Geological Laboratory.**—The geological laboratory is equipped with appliances for the study of specimens of

minerals, rocks, and fossils, and is supplied with collections which have been made and arranged expressly for the purpose of teaching. It is also supplied with instruments for field work, with a microscope and its accessories for the study of rock sections, and there is a machine for cutting, grinding, and polishing specimens, which is run by a separate dynamo and is always ready for use. In connection with the laboratory there is a good geological library which is supplied with the current publications. This equipment together with the facilities afforded for experiments and tests which may be made in the other laboratories of the Institute furnishes opportunities for much experimental work in geology. A person qualified to give direction to the work is always available for the instruction of laboratory students.

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

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

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

**Modern Languages.** — While the primary object of the instruction in French and German is to impart such facility



in translation that the student may avail himself of foreign works relating to his professional department, much importance is attached to the study of these languages as a means of general training. For both purposes, a thorough and systematic study of the structure of the language is deemed to be an essential basis. This is, however, accomplished by means of practical work with the language itself, including written and oral exercises, rather than by study of the abstract rules of grammar. French (see conditions of admission, page 62) is continued through one year, and German through two years, for all regular students.<sup>1</sup> In certain courses, especially in the General Course, there is advanced work in French and German, in part optional. Instruction in the elements of Italian and Spanish is also offered.

**English.** — All regular students receive instruction in English during the first two years of their course. During the first half of the first year they hear lectures and have exercises in English, the aim being not to develop a theory of rhetoric, but to train them to express themselves accurately and adequately. Each student writes, frequently and regularly, themes and exercises of various sorts, which are corrected and returned by the instructors. The student has also frequent opportunities for consulting the instructors in private about his especial needs. By arrangement with other instructors, the note-books in first-year chemistry, all written exercises in history and political economy for the second half of this year and during the third year, 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 several of the courses this criticism of the English is extended to technical papers in the fourth year. Throughout the second year instruction is given in the history of English literature, with practice in composition under the personal supervision and

<sup>1</sup> Students entering on German continue German for one year, then take two years of French.

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

In the General Course, instruction is offered in the following subjects, optional or required, — English literature before 1560, Elizabethan literature, English literature of the eighteenth century, English literature of the nineteenth century, contemporary English and American literature, logic, advanced English composition, and Latin reading with special reference to English Etymology. The aim in view is to give the student thorough drill, according to modern methods, in the literature and literary history of the periods mentioned, and to enable him, by theory and by practice, to express his ideas in a correct and adequate form.

Students have access to a library of two thousand volumes of selected works in English literature.

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

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

In the second year, Modern Political History of foreign nations, illustrating the political progress of the world during the present century, with particular reference to the growth of political institutions.

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

These three general subjects may be followed or accompanied by several series of more highly specialized historical and political studies, which are required in one or more

courses, and are open to all qualified students. The history of England and the United States may be studied continuously for three years; mediæval and modern European history throughout two years, introducing the student in the following year to the study of the era of the French Revolution.

The instruction in Social Science and History has been arranged so as to connect the instruction in biology with that in history. These two departments thus present an unbroken sequence of related studies extending through three successive years of the General Course curriculum, and resting upon the fundamental knowledge of living forms and of prehistoric man that is presented in general biology, zoölogy, and anthropology. The study of social science and history is followed by that of comparative politics and constitutional history. The last link in the chain is international law.

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

**Economics.** — In the group of economic studies extending through three years, the course upon the elements of political economy taken by all regular students is continued for those in the General Course by more detailed studies.

During succeeding years, the economic instruction is devoted to five different lines of inquiry, — Finance and taxation, commercial and industrial history, theories and methods of social reform, history of economic theory, and statistics.

The Financial History of the United States from 1789 until the present time is studied. Use of public documents is taught, and the student is required to go to official sources for authority as to statements of fact. A second course is directed to the theory and history of taxation in general.

A third optional course on the theory of banking and finance describes the most important banking institutions of the world, and treats with more detail the question of bimetallism.

Two courses in Commercial and Industrial History are presented.

The course on Social Reform considers the economic systems proposed, particularly during the present century, to change the existing distribution of wealth.

In the last term of the General Course, a return may be made by optional work to the study of Economic Theory. The previous general historical studies, as well as the more special ones in finance and industry, lead the student to the development of the different schools of economic thought from the mercantilists and physiocrats to the more modern representatives of the science.

In Statistics there are two courses. The first is elementary, and is devoted to the use of statistical data of the United States, especially in their application to the questions of population, commerce, and finance. The more advanced course treats of the general subject of statistics, its history, method, and technique. A good working library in statistics has been gathered, and the library of the American Statistical Association, kept in rooms of the department, affords special advantages.

(For a more detailed account of the courses in History and Political Science, see the circular of the General Course.)

The Reading-room of the department contains libraries of authorities to be consulted in the required reference work, a large number of the best magazines and newspapers, both bound and unbound, which are useful in historical, political, and literary study, together with reading-tables, and work-tables for the preparation of maps, charts, diagrams, and especially for statistical work. There is a good collection of maps and diagrams particularly serviceable for the illustration of industrial and political history. The library in connection with the reading-room comprises six

thousand selected volumes and several thousand pamphlets. Every student enjoys immediate and unrestricted access to the shelves.

**Military Science and Tactics.** — In conformity with the requirements of the Acts of Congress of July 2, 1862, and August 30, 1890, and the Acts of the General Court of Massachusetts in furtherance thereof, the Institute provides instruction in Military Science and Tactics.

All male students, except aliens, who take a majority of their studies in the first year are required to attend, for three hours per week, exercises in Military Science and Tactics.

For these exercises they are required to provide themselves with uniforms, which are made from measure and by contract, in order to secure uniformity of material and manufacture, as well as cheapness. The whole cost to each student does not exceed eighteen dollars. Any student may be excused from the prescribed course in the military department, if he is twenty-three years of age at entrance, or if he pass an examination in the subjects taught during the year. Should a student present to the Faculty satisfactory evidence of physical disability, he may be excused from the prescribed drill exercises, and in lieu thereof may be required to attend a course of theoretical studies in Military Science and Tactics. All medical certificates intended to show physical disability must be presented within ten days after entrance.

At the commencement of the school year an examination will be held with a view to the selection of officers and non-commissioned officers. It will cover the infantry drill regulations of 1891 from the beginning of the book to the school of the battalion, inclusive, both theoretically and practically, and will be open to all students.

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

**Libraries.**—The libraries of the Institute contain forty-one thousand volumes and nearly thirteen thousand pamphlets. In the General Library are to be found works on education, proceedings of learned societies that are of general character, and a complete set of the publications of the Institute and its officers; besides encyclopædias, dictionaries, catalogues of other libraries, and other books of reference. The greater part of the books belonging to the Institute are distributed to nine Department Libraries where they are easily accessible to all students. These libraries contain a careful selection of special treatises, monographs, text-books, etc., and of periodical publications germane to the work of the respective departments. They are thus working libraries, 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-eight pages form a schedule which includes the larger part of all the distinct topics or subjects of study taught in the Institute. These subjects are classified under headings, such as "Mathematics," "Chemistry," "Physics," "Civil Engineering," "Mining Engineering," etc. In the first column of the table is given the numeral by which any given topic is designated for convenience of reference, the same numbers appearing in the course schedules, pages 27 to 53; in the second column, the name of the subject; in the third and fourth, the number of the year (1st, 2d, 3d, or 4th) and the term (1st or 2d) in which the subject occurs; in the fifth, the number of hours per week given to exercises in the subject, the number of weeks being fifteen for each term, except as indicated by subscript figures; in the sixth, the number of the preparatory subject or subjects required of those desiring to be admitted to that in question; in the seventh, the manner in which the subject 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 eighth, the name of the professor or instructor in charge of the exercise; and in the ninth, the courses including this subject. The requirements in column six include not merely the subjects specified by number, but also those required as preparation for them. Thus, for instance, the requirements for 51 (Applied Mechanics) are 32 and 300; that for 32 is 29; that for 29 is 27; that for 27 is 22; those for 22 are 20 and 21; those for 20 and 21 are 1 and 2 (Algebra and

plane geometry required for admission, page 61); the requirement for 300 is 27 (or 23), which has already been followed through. So that to take up 51, Applied Mechanics, the applicant must be prepared to pass, or must have passed examinations, in 20, 21, 22, 27, 29, 32, 300, and in 1 and 2. The sufficient reason for this is, that in topic 51 use is made of all the subjects referred to; and to carry on the work, the student must have had suitable training in all of them. In the sixth column the numbers are in some cases in italics. This denotes that the corresponding topics, if not previously completed, must be taken at the same time with the topic under consideration. For instance, the student cannot take 420, Mechanism, unless he takes 29 and 78 at the same time, or has already completed them. Roman numerals in parentheses in the ninth column designate courses for which the topic in question is optional.

By a careful consideration of the schedule, in connection with the pages on the "Subjects and Methods of Instruction" (pages 71 to 115), the applicant for a special course may select for the earlier part of that course, such topics as will enable him to pursue later those more advanced subjects which he may particularly desire. He may also ascertain what preparatory training is requisite for admission to any special course at the Institute.

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

The subjects named below are the entrance requirements, full statements of which are given on pages 59 to 68.

- |  |             |
|--|-------------|
| 1. ALGEBRA.                                  | 5. ENGLISH. |
| 2. PLANE GEOMETRY.                           | 6. HISTORY. |
| 3. FRENCH OR (4) GERMAN.                     |             |
| 20. ADVANCED ALGEBRA OR (21) SOLID GEOMETRY. |             |



MATHEMATICS.									
No.	Subject.	Year.	Term.	Hours (1) Per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by	
20	Algebra <sup>(2)</sup> . . . . .	I	I	2	(1) (2) . . .	Rec.	Wells . . . . .	All reg. students.	
21	Solid Geometry <sup>(2)</sup> . . . . .	I	I	2	(1) (2) . . .	Rec.	Wells . . . . .	All reg. students.	
22	Logarithms and Plane Trigonometry . . . . .	I	{ 1 2 }	{ 2 1 <sub>10</sub> }	(20) (21) . .	Rec.	Wells . . . . .	All reg. students.	
23	Elements of Plane Analytic Geometry . . . . .	I	2	2	(22) . . . . .	Rec.	Bartlett, Bailey . . . . .	(V.) VII., IX., XII.	
27	Analytic Geometry . . . . .	I	2	4	(22) . . . . .	{ Lect., Rec. }	Woods . . . . .	{ All courses <sup>(4)</sup> except VII., IX., and XII.	
28	Differential and Integral Calculus . . . . .	2	I	3	(23) . . . . .	{ Lect., Rec. }	Woods . . . . .	(V.)	
29	Differential Calculus <sup>(3)</sup> . . . . .	2	I	3	(27) . . . . .	{ Lect., Rec. }	Runkle, Osborne . . . . .	{ All courses <sup>(4)</sup> except VII., IX., and XII.	
31	Determinants . . . . .	2	2	1	(22) . . . . .	{ Lect., Rec. }	Woods . . . . .	(VIII.)	
32	Integral Calculus . . . . .	2	2	3	(29) . . . . .	{ Lect., Rec. }	Runkle, Osborne . . . . .	{ All courses <sup>(4)</sup> except VII., IX., and XII.	
33	General Theory of Equations	3	I	2	(22) . . . . .	{ Lect., Rec. }	Woods . . . . .	(VIII.)	

(1) The number of weeks is 15 per term, except as indicated by subscript figures.  
 (2) Numbers 20 and 21 are alternative, one being required for entrance.

(3) With Spherical Trigonometry for Course I.  
 (4) Optional in Course V.

MATHEMATICS.								
No.	Subject.	Year.	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by
35	Differential Equations . . .	3	1	3	(32)	{ Lect., } Rec.	Osborne . . . . .	VI., VIII.
36	Elements of Differential Equations . . . . .	3	1	2½	(32)	{ Lect., } Rec.	Osborne . . . . .	II, X, XIII.
37	Quaternions . . . . .	3	1	2	(35)	{ Lect., } Rec.	Bailey . . . . .	(VIII.)
39	Analytic Geometry of Three Dimensions; Advanced Calculus . . . . .	3	2	3	(31) (32)	{ Lect., } Rec.	Woods . . . . .	(VIII.)
41	Fourier's Series; La Place's Coefficients . . . . .	4	1, 2	2	(39)	{ Lect., } Rec.	Bailey . . . . .	(VIII.)
42	Theory of Probability and Method of Least Squares	4	1	2	(32)	{ Lect., } Rec.	Bartlett . . . . .	I, 3, VI, VIII.
43	Differential Equations . . .	4	2	3	(32)	{ Lect., } Rec.	Osborne . . . . .	I, 3, VI. <sup>(1)</sup>
44	General Theory of Surfaces	4	1, 2	2	(39)	Lect.	Woods . . . . .	Elective.
45	General Theory of Functions	4	1, 2	2	(39)	Lect.	Woods . . . . .	Elective.

<sup>(1)</sup> For classes entering before 1894.

ANALYTICAL AND APPLIED MECHANICS.								
No.	Subject.	Year.	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by
50	Statics; Stresses in Frames; Strength of Materials; Kinematics and Dynamics; Theory of Elasticity . . .	3	1, 2	$\left. \begin{array}{l} 420 \\ 310 \end{array} \right\}$	(32) (300)	$\left. \begin{array}{l} \text{Lect.,} \\ \text{Rec.,} \\ \text{Lab.} \end{array} \right\}$	$\left. \begin{array}{l} \text{Lanza, Sondericker} \\ \text{Miller, Johnston} \end{array} \right\}$	$\left. \begin{array}{l} \text{I., XI.} \\ \text{II., III.}^{(1)} \text{ IV.,} \\ \text{VI.,}^{(1)} \text{ X., XIII.} \end{array} \right\}$
51	Statics and Stresses in Frames	3	1	2	(32) (300)	$\left. \begin{array}{l} \text{Lect.,} \\ \text{Rec.} \end{array} \right\}$	Sondericker . . .	$\left. \begin{array}{l} \text{II., III.}^{(1)} \text{ IV.,} \\ \text{VI.,}^{(1)} \text{ X., XIII.} \end{array} \right\}$
52	Strength of Materials; Kinematics and Dynamics . . .	3	2	3	(51) . . .	$\left. \begin{array}{l} \text{Lect.,} \\ \text{Rec.} \end{array} \right\}$	Sondericker . . .	$\left. \begin{array}{l} \text{II., III., VI., X.,} \\ \text{XIII.} \end{array} \right\}$
53	Strength of Materials; Graphical Statics . . .	3	2	3	(51) . . .	$\left. \begin{array}{l} \text{Lect.,} \\ \text{Rec.} \end{array} \right\}$	Sondericker . . .	IV.
54 55	Analytical Mechanics . . .	$\left. \begin{array}{l} 3 \\ 4 \end{array} \right\}$	$\left. \begin{array}{l} 2 \\ 1, 2 \end{array} \right\}$	$\left. \begin{array}{l} 3 \\ 3 \end{array} \right\}$	(35) (300)	$\left. \begin{array}{l} \text{Lect.,} \\ \text{Rec.} \end{array} \right\}$	Lanza . . . . .	VIII.
56	Strength of Materials; Theory of Elasticity <sup>(2)</sup> . . .	4	1	3	(52) . . .	$\left. \begin{array}{l} \text{Lect.,} \\ \text{Rec.,} \\ \text{Lab.} \end{array} \right\}$	Lanza, Miller . . .	I, XI.
57	Strength of Materials; Friction . . . . .	4	1	3	(52) . . .	$\left. \begin{array}{l} \text{Lect.,} \\ \text{Rec.,} \\ \text{Lab.} \end{array} \right\}$	Lanza, Miller . . .	$\left. \begin{array}{l} \text{II., III., VI., X.,} \\ \text{XIII.} \end{array} \right\}$
58	Strength of Materials . . .	4	1	3 <sup>1</sup>	(53) . . .	$\left. \begin{array}{l} \text{Lect.,} \\ \text{Rec.} \end{array} \right\}$	Lanza . . . . .	IV.
59	Strength of Materials; Stability of Structures; Theory of Elasticity . . .	4	2	3	(57) . . .	$\left. \begin{array}{l} \text{Lect.,} \\ \text{Rec.,} \\ \text{Lab.} \end{array} \right\}$	Lanza, Miller . . .	II., X., XIII.
60	Machinery and Motors <sup>(2)</sup> . . .	4	2	3	(56) . . .	$\left. \begin{array}{l} \text{Lect.,} \\ \text{Rec.} \end{array} \right\}$	Lanza . . . . .	I, 2.

(1) 10 weeks.

(2) For classes entering before 1894.

SCHEDULE OF TOPICS.

DRAWING.								
No.	Subject.	Year.	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by
70	Geometrical and Mechanical Drawing . . . . .	1	1	6	. . . . .	{ Lect., Draw. }	Faunce . . . . .	All reg. students.
71	Mechanical Drawing <sup>(1)</sup> . . . . .	1	2	6 <sub>5</sub>	(21) (70)	{ Lect., Draw. }	Faunce . . . . .	{ I., II., III., IV., VI., X., XI., XIII. }
72 } 73 }	Descriptive Geometry (continuation of 71) . . . . .	{ 1 1 }	{ 2 2 }	6 <sub>10</sub> 12 <sub>12</sub>	(71) . . . . .	{ Lect., Rec., Draw. }	Faunce . . . . .	{ I., II., III., VI., X., XI., XIII. IV. }
74	Mechanical Drawing . . . . .	1	2	6	(70) . . . . .	{ Lect., Draw. }	Faunce . . . . .	III., V., VIII., XII.
75	Mechanical Drawing (Chart and Map Making for IX.) . . . . .	1	2	4	(70) . . . . .	{ Lect., Draw. }	Faunce . . . . .	VII., IX.
78	Descriptive Geometry <sup>(2)</sup> (continuation of 72) . . . . .	2	1	5	(72) . . . . .	{ Lect., Rec., Draw. }	Faunce . . . . .	{ I., II., III., VI., X., XI., XIII. }
80	Freehand Drawing . . . . .	1	1	1	. . . . .	Draw.	Adams . . . . .	All reg. students.
81 } 82 }	Freehand Drawing . . . . .	{ 1 1 }	{ 2 2 }	2 3	(80) . . . . .	Draw.	Adams . . . . .	{ All courses except IV. }
83	Freehand Drawing . . . . .	2	1, 2	4	(82) . . . . .	Draw.	Adams . . . . .	IV.
84	Freehand Drawing . . . . .	3	1, 2	4	(83) . . . . .	Draw.	Adams . . . . .	IV.

<sup>(1)</sup> Course IV., 12 hours per week for 3 weeks.

<sup>(2)</sup> Applicants who have no previous knowledge of the subject, but are otherwise qualified to enter the second year of any of the courses named, should address Professor Faunce as early as possible.

## SHOPWORK.

No.	Subject.	Year.	Term.	Hours Per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge. All shopwork is under the general direction of Professor Schwab.	Taken by
90	Carpentry and Wood Turning	1	1	9	(70) (80)	Shop	Merrick . . . . .	Special Class.
91	Pattern Work . . . . .	1	2	6	(74) (81) (90)	Shop	Merrick . . . . .	Special Class.
92	Foundry Work . . . . .	1	2	3	(74) (81)	Shop	Merrick . . . . .	Special Class.
93	Forging . . . . .	1	1, 2	6, 3	(70) (80)	Shop	Lambirth . . . . .	Special Class.
95	Chipping and Filing . . . . .	1	1, 2	3, 3 $\frac{1}{2}$	(70) (80)	Shop	Lambirth . . . . .	Special Class.
96	Machine Tool Work . . . . .	1	2	6 $\frac{1}{2}$ , 9 $\frac{10}{10}$	(74) (81) (95)	Shop	Smith . . . . .	Special Class.
97	Carpentry and Wood Turning	2	1, 2	2	. . . . .	Shop	Merrick . . . . .	VI. II. (VIII.)
98		3	1	4				
99	Pattern Work . . . . .	2	2	2	(98)	Shop	Merrick . . . . .	XIII.
100		3	1	4				
101	Forging . . . . .	2	2	4	. . . . .	Shop	Lambirth . . . . .	II. X.
102		3	2	3				
103	Chipping and Filing . . . . .	2	2	6 $\frac{1}{2}$	. . . . .	Shop	Smith, Lambirth . . . . .	XIII. II.
104		3	1	6 $\frac{5}{10}$				
106	Machine Tool Work . . . . .	4	2	6 $\frac{10}{10}$	(103)	Shop	Smith . . . . .	II., XIII. II., XIII. (9)
107		4	2	6				
108	Metal Turning . . . . .	2	1	2	. . . . .	Shop	Smith . . . . .	VI. X.
110	Foundry . . . . .	2	2	2	. . . . .	Shop	Merrick . . . . .	(II.)
111	Pipe Fitting . . . . .	4	1	2	. . . . .	Shop	Smith . . . . .	XI.

(1) For classes entering after 1893, ten weeks in second term.

ENGLISH LANGUAGE AND LITERATURE.								
No.	Subject.	Year.	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by
120	Rhetoric and English Composition . . . . .	1	1	2	(5) (6) . . .	{ Lect., Rec., Comp. }	Bates . . . . .	All reg. students.
121	Logic . . . . .	1	2	3	(120) . . .	{ Lect., Rec. }	Pearson . . . . .	IX.
125	English Literature . . . . .	{ 2 3 }	1, 2	1 <sup>(1)</sup> , 2	(120) . . .	{ Lect., Rec., Comp. }	Bates . . . . .	{ All courses except X. X. }
129	English Literature: to 1660 . . . . .	3	1, 2	2	(125) . . .	{ Lect., Read. }	. . . . .	(IX.)
130	English Literature: 1660-1780 . . . . .	4	1	2	(125) . . .	{ Lect., Read. }	Bates . . . . .	IX.
131	English Literature: 1780-1860 . . . . .	4	2	2	(130) . . .	{ Lect., Read. }	Bates . . . . .	IX.
132	Contemporary English and American Literature . . . . .	4	1	2	(125) . . .	{ Lect., Read. }	Bates . . . . .	(IX.)
134	English Composition (advanced course) . . . . .	4	2	1	(125) . . .	{ Lect., Comp. }	Bates . . . . .	(IX.)
135	Journalism . . . . .	4	2	2	(125) . . .	{ Lect., Comp. }	Bates . . . . .	(IX.)
140	Latin Readings . . . . .	3	1, 2	2, 3	. . . . .	{ Lect., Rec. }	. . . . .	(IX.)

(1) Course IX., 20 hours for the term.

MODERN LANGUAGES.									
No.	Subject.	Year.	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by	
150	French (elementary) <sup>(1)</sup> . . . . .	2	1, 2	3	. . . . .	{ Lect., } { Rec. }	C. Bernard . . . . .	{ All reg. students } { not taking 100.	
151	French (grammar and trans- lation) . . . . .	1 or 3	1, 2	3	(3) or (150)	Rec.	van Daell. . . . .	All reg. students.	
152	French (sight reading) . . . . .	1	2	3	(151) . . . . .	Rec.	L. Bernard . . . . .	IV, IX.	
153	French (advanced) . . . . .	2	1, 2	3	(151) . . . . .	{ Lect., } { Rec. }	van Daell. . . . .	IX.	
155	French Literature . . . . .	3	2	2	(153) . . . . .	{ Lect., } { Rec. }	van Daell . . . . .	(IX.)	
160	German (elementary) <sup>(1)</sup> . . . . .	2	1, 2	3	. . . . .	Rec.	van Daell . . . . .	{ All reg. students } { not taking 150.	
161	German (grammar and trans- lation) . . . . .	3 or 1	1, 2	3	(4) or (160)	Rec.	Dippold. . . . .	All reg. students.	
162	German (advanced) . . . . .	4	1, 2	3	(161) . . . . .	{ Lect., } { Rec. }	Dippold . . . . .	Elective.	
164	German (sight-reading) . . . . .	3	1, 2	2	(161) . . . . .	Rec.	Vogel . . . . .	IX.	
165	Spanish <sup>(2)</sup> . . . . .	4	1, 2	2	(150) . . . . .	{ Lect., } { Rec. }	Erhardt . . . . .	(IX.)	
166	Italian <sup>(2)</sup> . . . . .	4	1, 2	2	(150) . . . . .	{ Lect., } { Rec. }	Erhardt . . . . .	(IX.)	

(1) Identical with entrance requirement. (See page 62.)

(2) Given alternate years.

HISTORY.									
No.	Subject.	Year.	Term.	Hours per Week	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by	
180	United States History . . .	1	2	2 <sup>(1)</sup>	(6)	{ Lect., Read. }	Currier . . . .	All reg. students.	
181	European History since 1815	{ 2 3 }	1	2	(180)	{ Lect., Rec. }	Currier . . . .	{ All reg. students, except IX. and X. X. }	
182	European History since 1815; History of England	2	1, 2	3, 2	(180)	{ Lect., Rec. }	Currier, Summer .	IX.	
184	History of England . . .	3	1, 2	2	(182) or (185)	{ Lect., Rec. }	Currier . . . .	(IX.)	
185	History and Literature of the Renaissance and the Reformation . . . .	{ 4 3 }	1, 2	{ 2 <sup>(2)</sup> 3 }	(6)	{ Lect., Rec. }	Summer . . . .	{ IV., (VII.) IX. }	
186	History of the Era of the French Revolution . . .	4	1, 2	2	(185)	{ Lect., Rec. }	Currier . . . .	(IX.)	
187	Local United States History	4	1, 2	2	(181) or (182)	{ Rec., Read. }	Currier . . . .	(IX.)	
188	History and Elements of Philosophy . . . . .	4	2	3	. . . . .	{ Lect., Rec. }	Dewey . . . .	IX.	

(1) For Course VII., first term, 3 hours.

(2) For Course IX., 3 hours.



ECONOMICS AND STATISTICS.				POLITICAL SCIENCE.				
No.	Subject.	Year.	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by
200	Political Economy . . . .	2	1	2	(180) . . . .	{ Lect., } { Rec.	Dewey . . . . .	IX.
201	Economic Problems . . . .	2	1	1	(200) or (205)	Read.	Ripley . . . . .	IX.
203	Political Economy and In- dustrial History <sup>(1)</sup> . . . .	4	2	2	(181) . . . .	{ Lect., } { Rec.	Dewey, Ripley . . . .	II, XIII.
205	Political Economy and In- dustrial History . . . .	{ 3 } { 4	1, 2	2, 1 <sup>(2)</sup>	(181) . . . .	{ Lect., } { Rec.	Dewey, Ripley . . . .	{ All Courses except IX. and X. { III, 1 <sup>(1)</sup> X. IX.
206	Statistics of the U. S., and Graphic Methods . . . .	3	1	2	(200) . . . .	{ Lect., } { Draw.	Dewey . . . . .	
207	Statistics of Sociology . . . .	4	1	3	{ (206) (212) } { or (213)	{ Lect., } { Rep.	Dewey . . . . .	(IX.)
210	Financial History of the U. S. <sup>(3)</sup>	3 or 4	1	3	(200) or (205)	{ Lect., } { Rec.	Dewey, Ripley . . . .	IX.
211	Commercial Geography <sup>(3)</sup> . . . .	3 or 4	1	2½	(200) . . . .	{ Lect., } { Rec.	Niles . . . . .	IX.
212	History of Commerce <sup>(3)</sup> . . . .	3 or 4	2	3	(182) (200)	{ Lect., } { Rec.	Dewey, Ripley . . . .	IX.
213	History of Industry . . . .	3 or 4	2	3	(182) (200)	{ Lect., } { Rec.	Dewey, Ripley . . . .	IX.
214	Theories and Methods of Social Reform . . . .	3	1, 2	2	(200) or (205)	Lect.	Dewey . . . . .	(IX.)
215	Taxation and Administration	3 or 4	1	3	(201) . . . .	{ Lect., } { Rec.	Dewey, Ripley . . . .	IX.
216	History of Economic Theory	4	2	-	(210) (215)	{ Lect., } { Rec.	Dewey . . . . .	(IX.)

(1) For classes entering before 1894.

(2) See 235.

(3) Alternating subjects not given the present year.

ECONOMICS AND STATISTICS.				POLITICAL SCIENCE.				
No.	Subject.	Year.	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by
217	Economics of Corporations <sup>(1)</sup>	4	2	2	(205)	{ Lect., } { Rec. }	Dewey . . . . .	VI.
225	Descriptive Sociology . . . . .	{ 3 } { 4 }	2	3	(615)	{ Lect., } { Rec. }	Ripley . . . . .	{ IX. } { (VII.) }
226	Comparative Politics and Constitutional History. }	4	1, 2	3	{ (225) (180) } { or (181) }	{ Lect., } { Rec. }	Currier . . . . .	IX.
227	International Law . . . . .	4	1	2	(226) or (181)	{ Lect., } { Rec. }	Ripley . . . . .	IX.
230	Banking and Finance . . . . .	4	2	2	(210)	{ Lect., } { Rec. }	{ Not given the present year. }	{ (IX.) }
235	Business Law <sup>(2)</sup> . . . . .	{ 3 } { 4 }	1, 2	1	. . . . .	Lect.	Brandeis . . . . .	{ All courses except } { X. } { X. }
<b>CHEMISTRY.</b>								
240	General Chemistry . . . . .	1	1	7	{ (1)(2)(3)(4) } { (5)(6) }	{ Lect., } { Lab., } { Rec. }	Pope, Bardwell . . . . .	All reg. students.
241	General Chemistry: Qualitative Analysis . . . . .	1	2	6	(240)	{ Lect., } { Lab. }	Pope, Bardwell . . . . .	{ All courses except } { IV, IX. }
245	Theoretical Chemistry: Atomic Weights and Stoichiometry . . . . .	2	1	2	(241)	{ Lect., } { Rec. }	Noyes . . . . .	III, V, VII, VIII.

(2) Alternating subject, not given the present year. Time transferred to 205.

(1) For classes entering after 1893.

CHEMISTRY.								
No.	Subject.	Year.	Term.	Hours per Week	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by
246	Analytical Chemistry: Qualitative Analysis . . . . .	2	1	10	(150) or (160) (241)	{ Lect., { Lab. }	Talbot, Walker . . . . .	V., VII. VIII. X. XII. XI.
247				6				
248				9				
249				8				
250				4				
251	6, 8	1	2	4				
255	Analytical Chemistry: Quantitative Analysis . . . . .	2	2	8	(246) (247) or (248) (249) (250) (251)	{ Lect., { Lab. }	{ Talbot, Walker, { Moore	V., VII. VIII., X. XII. XI. III., 1, 2.
257				5 <sup>(1)</sup>				
258				6				
259				3				
260				7, 8				
262	Organic Chemistry . . . . .	2	1	1	(241)	Lect.	Noyes . . . . .	XI.
263	Theoretical Chemistry: Solutions . . . . .	3	1	2	(245)	{ Lect., { Lab. }	Talbot, Fay . . . . .	V., VI, 1.
264	Organic Chemistry . . . . .	3	2	1	(263)	Lect.	Crafts . . . . .	V.
265	Theoretical Chemistry: Chemical Energy . . . . .	3	2	{ 1 2	{ (245) { (263)	{ Lect. { Rec. }	Noyes . . . . .	{ VIII. { V.
266	Industrial Chemistry . . . . .	3	1, 2	{ 2 3 <sub>10</sub>	{ (151) or (161) { (241)	{ Lect. { }	Thorp . . . . .	V., X.
267	Industrial Chemical Laboratory . . . . .	3	1 or 2	6	(255) or (257) (266)	Lab.	Smith . . . . .	{ (V.) { X.
268				5				
				2				
269	Analytical Methods . . . . .	3	1, 2	2, 1	(255) or (258)	{ Lect., { Rec. }	Talbot . . . . .	V., (VIII.), XII. III.
		4	1, 2	2, 1	(260)			

(1) Three additional hours optional for VIII.

CHEMISTRY.																			
No.	Subject.	Year.	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by											
270	Analytical Chemistry : Quantitative Analysis . . . . .	3	1	4	(255)	Lab.	Talbot . . . . .	VII.											
271									3	1, 2	(355)	{	{	V.					
272															4	{	(253)	{	(VII),
273																			
274	4	{	(260)	{	III, <sup>1, 2</sup>														
277						3	1 or 2	(255) or (359)	{	{	(V),								
279												4	2	(270) (271) or (272)	{	{	VII, XI		
282																		4	1, 2
284	4	1	(277) . . . . .	{	{														
285						4	1	(264) (282) . . . . .	{	{	XI								
286												4	1	(255) or (257)	{	{	V		
287																		4	1
288	4	1	(267) . . . . .	{	{														
289						4	1, 2	(266) . . . . .	{	{	(V), (X)								
290												4	1	(241) . . . . .	{	{	X		
292																		4	1
294	4	2	(271) (282) . . . . .	{	{														
						4	2	(271) (282) . . . . .	{	{	V								
												4	2	(271) (282) . . . . .	{	{	V		
																		4	2
	4	2	(271) (282) . . . . .	{	{														

(1) Additional work optional

PHYSICS.									
No.	Subject.	Year.	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by	
300	Physics: Wave Motion, Electricity, Optics . . . }	2	1, 2	5	(23) or (27)	{ Lect., } { Rec. }	{ Cross } { Drisko }	All reg. students.	
301	Descriptive Astronomy . . .	2	1	2	(23) or (27)	Read.	Clifford . . . .	VIII.	
302	Acoustics . . . . .	2	1	2	(27) (300)	{ Lect., } { Rec. }	Clifford . . . .	VI., VIII.	
303	Physical Laboratory . . . .	2	2	2	(28) (241) (302)	Lab.	{ Goodwin, Derr, } { Norton }	VI., VIII.	
304	Physical Laboratory . . . .	2	2	2	(23) (300)	Lab.	Goodwin . . . .	IX.	
305	Physical Measurements . . .	2	2	1	(302)	Lect.	Goodwin . . . .	VI., VIII.	
306	Theoretical Electricity . . .	2	2	2	(302)	{ Lect., } { Rec. }	Clifford . . . .	VI., VIII.	
309	Heating and Ventilation . .	3	1	{ 2 <sub>10</sub> } { 3 <sub>5</sub> }	(300)	Lect.	Woodbridge . . .	IV.	
310	Physics: Heat . . . . .	3	1	2 <sub>8</sub>	(300)	Lect.	Clifford . . . .	{ All courses except } { IV. }	
311	Physical Laboratory . . . .	3	{ 1 } { 2 }	{ 2 <sub>7</sub> } { 2 }	(310)	Lab.	{ Goodwin, Derr, } { Norton }	{ I., II., V., VII., X., } { XI., XII., XIII. }	
312	Physical Laboratory . . . .	3	1, 2	2 <sub>7</sub> , 4	(303)	Lab.	Goodwin . . . .	VIII.	
313	Physical Laboratory . . . .	3	1, 2	2 <sub>7</sub> , 3	(303)	Lab.	{ Goodwin, Derr, } { Norton }	III., VI.	
314	Methods of Telegraphy . . .	3	1	2 <sub>8</sub>	(302)	Lect.	Derr . . . . .	VI., VIII.	
315	Theoretical Electricity . . .	3	{ 1 } { 2 }	{ 2 <sub>7</sub> } { 2 <sub>8</sub> , 1 <sub>7</sub> }	(302)	{ Lect., } { Rec. }	Clifford . . . .	VI., VIII.	

PHYSICS.

No.	Subject.	Year.	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by
316	Industrial Electricity . . . . .	3	1	1	(300)	Lect.	Cross . . . . .	{ I. <sup>(3)</sup> , II., III., V. <sup>(8)</sup> , VI., VIII., X., XI. <sup>(6)</sup> }
317	Dynamo-Electric Measurements . . . . .	3	1	1	(300)	{ Lect., Lab. }	Puffer . . . . .	II., III. <sup>1</sup>
319	Electrical Measuring Instruments and Methods . . . . .	3	2	{ 18 27 }	(311) or (315)	Lect.	Laws . . . . .	(V.), VI., VIII.
322	Electrical Measuring Instruments and Methods . . . . .	4	1	11	(319)	Lect.	Laws . . . . .	VI., VIII.
323	Electrical Measurements <sup>(1)</sup> . . . . .	4	1	4	(311)	{ Read., Lab. }	Puffer, Laws . . . . .	III. <sup>1</sup>
324	Physical Colloquium . . . . .	4	1, 2	2	(317)	Read.	Goodwin . . . . .	VIII.
325	Physical Laboratory . . . . .	4	1, 2	4, 3	(311)	Lab.	Derr . . . . .	I. <sup>3</sup>
327	Electrical Testing; Dynamo Testing . . . . .	4	1	5	(311) (322)	Lab.	{ Cross, Puffer, } Laws	VI., VIII.
328	Heat Measurements . . . . .	4	1	{ 2 4 }	(317), (312) or (313)	Lab.	Norton . . . . .	{ III. <sup>(4)</sup> , VIII., (X.) }
329	Color and Acoustics . . . . .	4	1	15	(300)	Lect.	Cross . . . . .	IV.
330	Principles of Scientific Investigation . . . . .	4	2	3		Read.	Cross . . . . .	VIII.
331	Optics . . . . .	4	1, 2	3	(32)	Lect.	Clifford . . . . .	VIII.
332	Theory of Periodic Currents . . . . .	4	1, 2	1, 2	(315)	Lect.	Clifford . . . . .	VI., VIII. <sup>(2)</sup>

(1) For classes entering before 1894. (2) Optional in second term. (3) Fourth year. (4) For classes entering after 1893.

PHYSICS.									
No.	Subject.	Year.	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by	
333	Electrical Engineering . . . . .	4	1, 2	$\left\{ \begin{array}{l} 4 \\ 5 \end{array} \right\}$	(313) (315) (316)	Lect. { Lect., { Lab. }	Cross . . . . .	VI.	
334	Telephone Engineering . . . . .	4	2	— <sup>(1)</sup>	(313) (315) (315 <sup>(2)</sup> )	Lect.	Hayes . . . . .	VI.	
335	Railroad Signals . . . . .	4	1	— <sup>(1)</sup>	(300) . . . . .	Lect.	Bloodgett . . . . .	I, VI.	
336	Dynamo and Motor Testing . . . . .	4	1, 2	— <sup>(1)</sup>	(313) (316) (319)	Lect.	Puffer . . . . .	VI.	
337	Photometry . . . . .	4	1	— <sup>(1)</sup>	(311) or (313)	Lect.	Clifford . . . . .	VI, VIII.	
338	Heating and Ventilation . . . . .	4	1	$\left\{ \begin{array}{l} 1 \\ 2 \end{array} \right\}$	(310) . . . . .	Lect.	Woodbridge . . . . .	{ II, IV <sup>(2)</sup> , XI.	
339	Elements of Dynamo Ma- chinery <sup>(2)</sup> . . . . .	4	1	I <sub>5</sub>	(300) . . . . .	Lect.	Cross . . . . .	L, II, III, XIII.	
342	Precision of Measurements . . . . .	4	2	I <sub>10</sub>	(42) . . . . .	Lect.	Clifford . . . . .	VI, VIII.	
343	Electro-Motors . . . . .	4	2	— <sup>(1)</sup>	(323) or (340)	Lect.	Puffer . . . . .	VI.	
344	Principles of Dynamo Design . . . . .	4	2	— <sup>(1)</sup>	(323) . . . . .	Lect.	Derr . . . . .	VI.	
347	Energetics . . . . .	4	1	2	(32) (265) (317)	Lect.	Goodwin . . . . .	VIII.	
350	Electro-Chemistry . . . . .	4	2	2	(347) . . . . .	Lect.	Goodwin . . . . .	VIII.	
351	Physico-Chemical Laboratory . . . . .	3	2	$\left\{ \begin{array}{l} 1 \\ 1^{(3)} \end{array} \right\}$	(265) . . . . .	Lab.	Goodwin . . . . .	{ VIII, (V, (VIII.)	
352	Potential, Theory of . . . . .	4	2	2	(315) . . . . .	Lect.	Clifford . . . . .	(VIII.)	
353	Electrical and Heat Meas- urements <sup>(4)</sup> . . . . .	4	2	2	. . . . .	Lab.	Laws, Norton . . . . .	V.	
358	Electro-Magnetic Theory of Light . . . . .	4	2	2	. . . . .	Lect.	Clifford . . . . .	Elective.	
359	Photography . . . . .	4	2	1	. . . . .	Lect.	Derr . . . . .	Elective.	

(1) Time specially arranged each year. (2) For classes entering before 1894. (3) Additional work optional for Course VIII. (4) Not given the present year.

CIVIL ENGINEERING.									
No.	Subject.	Year.	Term.	Hours per Week	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by	
360	Surveying and Plotting . . . . .	2	I, 2	6, 5	(27) (72)	Lect., Rec., Field, Draw.	Burton, Robbins . . . . .	{ I, III, 1, (1) XI, XII. }	
362	Topographical Drawing . . . . .	2	1	2	{ (72) (81) } { (360) }	Draw.	Burton, Robbins . . . . .	I, III, 1, XI, XII.	
363	Elements of Astronomy . . . . .	2	1	1	(360) . . . . .	Lect., Rec., Field.	Burton . . . . .	I.	
370	Surveying . . . . .	3	I, 2	2	(300) (362).	Lect., Rec., Field, Draw.	Burton, Robbins . . . . .	I, XI, XII.	
371	Surveying Instruments (six lessons) . . . . .	3	2	-(2)	(438) . . . . .	Lect., Field.	Burton, Robbins . . . . .	II.	
372 } 373 }	Railroad Engineering . . . . . Highway Engineering . . . . .	3	1, 2	{ 2(8) } { 3(3) }	{ (32) (360) } { (374) } . . . . .	{ Lect., Rec. }	{ Allen, } { Robbins }	I, XI.	
374	Railroad Field-work and Drawing . . . . .	3	{ 1, 2, 4, 5 } { 1, 2, 2, 5 }	{ (362) (372) }	{ Field, Draw. }	Allen, Robbins. . . . .	{ I, XI. }		

(2) Time included in 438.

(1) In second term, for Course XI., 6 hours; for Course III., 4 hours.

(3) For Course XI., 10 weeks in first term, 12 in the second.



CIVIL ENGINEERING.									
No.	Subject.	Year	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by	
375	Stereotomy . . . . .	3	1	4	(78)	{ Rec., Draw. }	Porter . . . . .	I, XI.	
376	Theory of Structures . . . . .	3	2	1 <sub>5</sub> 2 <sub>10</sub>	(50)	{ Lect., Rec. }	Swain . . . . .	I, XI.	
385	Railroad and Highway En- gineering . . . . .	4	1, 2	2, 3	(372)(376)	{ Lect., Rec. }	Allen, Robbins . . . . .	I, 2.	
386	Railroad Management . . . . .	4	1	2	(205) (372)	Lect.	Allen . . . . .	I, 2.	
387	Geodesy (see also 407) . . . . .	4	1, 2	3	(42) (370)	{ Lect., Rec., Field. }	Burton . . . . .	I, 3.	
388	Practical Astronomy . . . . .	4	1	1	(32) (370)	Lect.	Robbins . . . . .	I, 1, 3.	
389	Geodetic Surveying . . . . .	4	1	2	(23) (370)	{ Lect., Field. }	Burton . . . . .	XII.	
390	Theoretical Hydraulics . . . . .	4	1	3	{ 50 } { 52 }	{ Lect., Rec. }	Porter . . . . .	{ I, XI. II, III, VI, } { (X), XIII. }	
391									
392	Sanitary and Hydraulic En- gineering . . . . .	4	1	3	(300) (303)	{ Lect., Rec. }	Porter . . . . .	I, 1, XI.	
393	Hydraulic Measurements . . . . .	4	1	2	{ (390) or (391) for XII. (370) }	{ Field., Draw., Rec. }	Porter . . . . .	{ I, 1, 3, (X), XI, XII. }	
394	Theory of Structures . . . . .	4	1, 2	2	(376)	{ Lect., Rec. }	Swain . . . . .	I, 1, 2.	

CIVIL ENGINEERING.									
No.	Subject.	Year.	Term.	Hours per Week	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by	
396	Theory of Structures: Bridges and Similar Structures . . . . .	4	1, 2	3	(375)	{ Lect., Rec. }	Swain . . . . .	I-3, XI.	
397	Bridges and Similar Structures . . . . .	4	1, 2	2	(394)	{ Lect., Rec. }	Swain . . . . .	I-1, 2.	
398 } 399 }	Bridge Design . . . . .	{ 4 4 }	{ 1, 2 1 }	{ 6 5, 4 }	{ (394) (397) (396) }	Draw.	Swain, McKibben	{ I-1, 2, I-3, XI.	
400	Hydraulic Motors . . . . .	4	2	2	(391)	{ Lect., Rec. }	Porter . . . . .	II, (X.).	
401	Hydraulic Engineering . . . . .	4	2	3	(390) (393)	{ Lect., Rec. }	Porter . . . . .	I-1, 3, XI.	
402	Engineering Laboratory . . . . .	4	2	2, 8	(390)	Lab.	Miller . . . . .	I-1, 2, XI.	
403	Railroad and Highway Design . . . . .	4	1, 2	3	(385)	Draw.	Allen, Robbins . . . . .	I-2.	
404	Sanitary and Hydraulic Designing . . . . .	4	2	{ 2 6 }	(392)	Draw.	Porter . . . . .	{ I-1, XI.	
405	Hydraulic Machinery . . . . .	4	2	2	(401)	{ Lect., Rec. }	Porter . . . . .	XI	
407	Geodesy (see 387) . . . . .	4	2	1	(32) (370)	{ Lect., Rec. Field. }	Burton . . . . .	I-1.	
409	Foundations (1) . . . . .	4	2	1	(394)	Lect.	Swain . . . . .	I-1, 2.	

(1) For classes entering after 1893.

MECHANICAL ENGINEERING.									
No.	Subject.	Year.	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by	
420	Principles of Mechanism . . . . .	2	1	2	(29) (78)	{ Lect., } { Rec. }	Merrill, Park . . .	{ II., III., VI., X., } { XIII. }	
422	Drawing . . . . .	2	1	2	(420)	Draw.	{ Schwamb } { Hambiet }	II., XIII.	
423	Drawing . . . . .	2	2	6	(427)	Draw.	{ Schwamb } { Hambiet }	{ II., X. } { III., VI. } { XIII. }	
424									3
425									3
426									5
427	Mechanism: Construction of Gear-Teeth, Machine Tools, Cotton Machinery	2	2	3	(420) (423)	{ Lect., } { Rec. }	Merrill . . . . .	II., X.	
428	Mechanism: Construction of Gear-Teeth, Machine Tools . . . . .	2	2	2	{ (424) } { (425) } { (426) } (420)	{ Lect., } { Rec. }	Merrill, Park . . .	{ III., VI. } { XIII. }	
430	Principles of Mechanism . . . . .	2	2	2	(29) (78)	{ Lect., } { Rec. }	Merrill . . . . .	I.	
433	Steam Engineering: Valve Gears, Boilers . . . . .	3	1, 2	3	{ (427) (438) } (32) { (428) (439) } (51) { (428) (440) } (52) { (427) (441) } (319) { (428) (442) }	{ Lect., } { Rec. }	Peabody, Miller . . .	{ II., III., VI. } { X. } { XIII. }	

MECHANICAL ENGINEERING.									
No.	Subject.	Year.	Term.	Hours per Week	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by	
438 439 440 441 442	Drawing, Design . . . . .	3	{ 1, 2 1 1, 2 1, 2 1	{ 6, 5 5 3, 2 6, 2 2	{ (423) (424) (425) (453) (423) (426)	Draw.	{ Peabody Schwamb Famblet	{ II, III, <sup>2</sup> VI, X, XIII.	
443	Engineering Laboratory . . . . .	3	2	2	(433)	Lab.	Miller . . . . .	{ II, III, <sup>2</sup> , VI, X, XIII.	
450	Steam Engineering . . . . .	4	1	2 <sub>8</sub>	(433)	{ Lect., Rec.	Peabody . . . . .	{ II, VI, X, XIII.	
451 452	Dynamics of Machines . . . . .	{ 4 4	{ 1 1	{ 3 <sub>6</sub> 3 <sub>8</sub>	(57) (433)	{ Lect., Rec.	Lanza . . . . .	{ II, XIII. VI, X.	
453	Machine Design . . . . .	4	1	9	{ (57) (433) (438) (451)	{ Lect., Rec., Draw.	Schwamb. . . . .	II.	
455	Engineering Laboratory . . . . .	4	1, 2	4	{ (391) (443) (450) (451) or (452)	{ Lab.	Miller . . . . .	II, VI, <sup>0</sup> , X, <sup>0</sup> , XIII.	
456	Engineering Laboratory . . . . .	4	2	4	(57) (433) (443)	Lab.	Miller . . . . .	III, <sup>2</sup> .	
459	Steam Engineering . . . . .	4	1	2	(32) (310) (430)	{ Lect., Rec.	Peabody . . . . .	I, <sup>1</sup> , <sup>2</sup> .	

(1) Course VI, 45, X., 50 hours, first term.

MECHANICAL ENGINEERING.									
No.	Subject.	Year.	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by	
460	Locomotive Construction								
461	Marine Engineering . . . . .	4	1, 2	3 <sup>o</sup> , 3	{ (57) (591) } { (450) (451) }	{ Lect. } { Rec. }	{ Lanza . . . . . } { Peabody . . . . . } { Schwamb. . . . . }	II. <sup>2</sup> , II. <sup>1</sup> , XIII. II. <sup>3</sup> .	
462	Mill Engineering . . . . .								
463	Technical Machinery . . . . .	4	2	2	(450) . . . . .	Lect.	Merrill . . . . .	X.	
465	Foundations <sup>(1)</sup> . . . . .	4	2	2 <sub>5</sub>	(59) . . . . .	Lect.	Lanza . . . . .	II.	
466	Shop Management <sup>(1)*</sup> . . . . .	4	2	2 <sub>5</sub>	{ (460) (461) } { or (462) }	Lect.	Schwamb. . . . .	II.	
NAVAL ARCHITECTURE.									
474	Naval Architecture . . . . .	3	1, 2	2	{ (52) (51) } { (428) (433) } (475)	Lect.	Peabody . . . . .	XIII.	
475	Naval Architectural Drawing	3	1, 2	6, 5	(474) . . . . .	Draw.	Peabody . . . . .	XIII.	
476	Naval Architecture . . . . .	4	1, 2	2	{ (57) (433) } { (460) (451) } { (461) (474) } (477)	Lect.	Peabody . . . . .	XIII.	
477	Naval Architectural Drawing	4	1, 2	4, 6	(476) . . . . .	Draw.	Peabody . . . . .	XIII.	

(1) Not given as a distinct course the present year.

MINING ENGINEERING.									
No.	Subject.	Year.	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by	
480	Blowpipe Silver Assay . . . . .	2	1	2	(241)	Lab. . . . .	Richards . . . . .	III, 1, (III, 2)	
481	Mining Engineering . . . . .	{ 3 4 }	{ 1, 2 1 }	{ 3 3 }	{ (300) (360) (500) (561) }	Lect. . . . .	Richards, Hofman	{ III, (XII.) }	
482 } 483 } 484 }	Assaying by Fire . . . . .	{ 3 3 4 }	{ 1 2 2 }	{ 4 2 2 }	(561) (562)	Lab. . . . .	Lodge . . . . .	{ III, V, XII. }	
487	Metallurgy of Iron . . . . .	4	1	1	(241)	Lect. . . . .	Richards . . . . .	{ I, 1, 2, X, XI, XIII. }	
488	Metallurgy of Non-ferrous Metals . . . . .	4	1	2	(241)	Lect. . . . .	Hofman, Howe . . . . .	III, (XII.)	
489	Elements of Non-ferrous Metallurgy . . . . .	4	1	1	(241) (561)	Lect. . . . .	Hofman . . . . .	(V.), X.	
490	Ore Dressing and Non-ferrous Metallurgy . . . . .	4	1	5	(483)	Lect. . . . .	Richards, Hofman	(V.)	
492	Metallurgical Laboratory . . . . .	4	{ 1, 2 2 }	{ 8, 14 8, 12 8 }	{ (274) (300) (482) (495) }	Lab. . . . .	Richards, Lodge . . . . .	{ III, 1 III, 2 (V.) }	
493	Mining Engineering . . . . .	4	1, 2	2	(300) (561)	Lect. . . . .	Richards . . . . .	III.	
494	Metallurgy of Non-ferrous Metals and General Metallurgy . . . . .	4	2	3	(488) or (489)	Lect. . . . .	Hofman . . . . .	III, (V.), (X.)	
495	Memoirs . . . . .	4	1, 2	2	(492)	Read. . . . .	{ Richards, Hofman Lodge . . . . . }	III.	

## ARCHITECTURE.

No.	Subject.	Year.	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by
510	Orders . . . . .	2	1	2	(73) (83)	{ Lect., Rec., Draw. }	Gardner . . . . .	IV.
511	Shades and Shadows . . . . .	2	1	1	(73) (82)	{ Lect., Draw. }	Lawrence . . . . .	IV.
512	Materials . . . . .	2	1	1	(73) . . . . .	Lect.	Chandler . . . . .	IV.
513	Perspective . . . . .	2	2	1 <sup>10</sup>	(511) . . . . .	{ Lect., Draw. }	Lawrence . . . . .	IV.
514	Design . . . . .	2	2	7	{ (510) (511) } { (82) }	Draw.	{ Despradelle, } { Gardner . . . . . }	IV.
515	Stereotomy . . . . .	2	2	1	(73) . . . . .	{ Lect., Draw. }	Lawrence . . . . .	IV.
516	Pen and Ink . . . . .	3	2	1	(83) . . . . .	Draw.	Gregg . . . . .	IV.
517	Architectural History . . . . .	3	1, 2	1	(510) . . . . .	{ Lect., Draw. }	Homer . . . . .	IV.
520	Specifications and Working Drawings . . . . .	3	1, 2	1	(512) . . . . .	{ Lect., Draw. }	Chandler . . . . .	IV.
522	Design . . . . .	3	1, 2	10, 14	(84) (514)	Draw.	Despradelle, Mead	IV.

ARCHITECTURE.

No.	Subject.	Year.	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by
523	Water Color . . . . .	3	2	2	(84)	. . . . .	Turner . . . . .	IV.
524	Pen and Ink . . . . .	4	1, 2	1	(516)	Draw. . . . .	Gregg . . . . .	IV.
530	History of Construction . . . . .	4	1	1	(520)	Lect. . . . .	Chandler . . . . .	IV.
531	History of Ornament . . . . .	4	1, 2	1 <sub>10</sub>	{ (84) (516) { (522) } { (522) (531) } { (535) }	{ Lect., { Draw. }	Walker . . . . .	IV.
532	Advanced Design . . . . .	4	{ 1 } 2	{ 16 } 18	{ (522) { (535) }	Draw. . . . .	Despradelle . . . . .	IV.
534	Water Color . . . . .	4	1, 2	2	(523)	. . . . .	Turner . . . . .	IV.
535	Life Class . . . . .	4	1, 2	4	(84)	Draw. . . . .	Adams . . . . .	IV.
536	Constructive Design . . . . .	4	1	1	(58) (515)	{ Lect., { Draw. }	Lawrence . . . . .	IV.
537	Business Relations, Con- tracts, etc. . . . .	4	2	1	(520)	Lect. . . . .	Chandler . . . . .	IV.
539	Modelling . . . . .	4	1, 2	2	(84)	. . . . .	Bartlett . . . . .	IV.
540	Building Construction . . . . .	4	2	1	. . . . .	Lect. . . . .	Chandler . . . . .	I, XI.
541	Architecture of the Renais- sance . . . . .	4	1, 2	1, 2	(517)	Lect. . . . .	Homer . . . . .	IV.
542	History of Painting and Sculpture (1) . . . . .	4	2	1	(541)	Lect. . . . .	. . . . .	IV.

(1) For classes entering after 1893.



NATURAL SCIENCES.									
No.	Subject.	Year.	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by	
555	Physiography . . . . .	2	1	2	{ 300 } 1st term	Lect. .	Niles . . . . .	XII.	
560	Physical Geography . . . . .	2	2	3	{ (300) } { 1st term }	Lect. .	Niles . . . . .	{ I, III <sub>a</sub> , (V.), VII, IX, XI, XII.	
561	Mineralogy . . . . .	2	2	4	(241) . . . . .	{ Lect., } { Lab. }	Crosby, Barton .	III, V, VII, XII.	
562	Determinative Mineralogy . . . . .	2	2	2	(241) (561)	Lab. .	Barton . . . . .	III, V, VII, XII.	
564	Building Stones . . . . .	3	1	2	(240) . . . . .	{ Lect., } { Lab. }	Crosby . . . . .	IV.	
565	Structural Geology . . . . .	3	1	2	(241) (560)	{ Lect., } { Lab. }	Barton . . . . .	I, IX, XI.	
566	Structural and Chemical Geology . . . . .	3	1	3	(560) (561)	{ Lect., } { Lab. }	Crosby . . . . .	{ III <sub>a</sub> , (V.), VII, XII.	
567	Geological Field-work and Sketching . . . . .	3	1	6	(566) . . . . .	{ Field, } { Lab. }	Crosby, Grabau .	XII.	
568	Stratigraphic Geology . . . . .	3	2	2	(565) . . . . .	{ Lect., } { Rec. }	Niles . . . . .	I.	
569	Historical Geology . . . . .	3	2	3	(565) or (566)	{ Lect., } { Rec. }	Niles . . . . .	{ III <sub>a</sub> , (V.), VII, IX, XII.	
570	Mineralogy . . . . .	3	2	4	(561) (562)	{ Lect., } { Lab. }	Crosby . . . . .	XII.	

NATURAL SCIENCES.									
No.	Subject.	Year.	Term.	Hours Per Week.	Preparation Requir. . . . .	Method of Instruction.	Instructor in Charge.	Taken by	
571	Geological Maps and Sections . . . . .	3	2	2	{ (566) (567) } { (569) }	{ Field., } { Draw. }	Niles . . . . .	XII.	
572	Structural Palæontology . . . . .	3	1, 2	2	(605) . . . . .	Lab. . . . .	Grabau . . . . .	XII.	
580	Climatology . . . . .	4	1	2	(300) . . . . .	{ Lect., } { Rec. }	Niles . . . . .	(VII.), IX., XII.	
581	Geological Field-work and Laboratory . . . . .	4	1, 2	8, 10	(567) . . . . .	{ Field., } { Lab. }	{ Niles, Crosby, } { Barton, Grabau }	XII.	
583	Physiographic Geology . . . . .	4	1	3	(569) . . . . .	Rec. . . . .	Niles . . . . .	XII.	
584	Geological Memoirs . . . . .	4	1, 2	1	(569) . . . . .	Rec. . . . .	Niles . . . . .	XII.	
586	Stratigraphical Palæontology . . . . .	4	1	5	(569) (572)	Lab. . . . .	Niles, Grabau . . . . .	(XII.)	
587	Economic Geology . . . . .	4	2	4	{ (566) (569) } { (570) }	{ Lect., } { Lab. }	Crosby . . . . .	XII.	
589	Micro-Lithology . . . . .	4	1, 2	3	{ (566) (569) } { (570) }	{ Lect., } { Lab. }	Barton . . . . .	XII.	
590	Hydrography . . . . .	4	2	3	(569) . . . . .	Rec. . . . .	Niles . . . . .	XII.	

NATURAL SCIENCES.									
No.	Subject.	Year.	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by	
591	Ore Deposits . . . . .	4	1	2	{ (566) (569) } { (570) }	{ Lect., } { Lab. }	Crosby . . . . .	XII.	
600 } 601 } 602 }	General Biology . . . . .	{ 2 } { 3 } { 2 }	1	{ 5 } { 2 } { 4 }	(240) . . . . .	{ Lect., } { Rec., } { Lab. }	Sedgwick, Prescott	{ VII. } { XI. } { IX., XII. }	
603	Microscopy . . . . .	{ 1 } { 2 }	2	2	(240) . . . . .	{ Lect., } { Rec., } { Lab. }	Sedgwick, Prescott	{ VII. } { (V.), VIII. }	
604	General Biology . . . . .	2	2	1	(241) . . . . .	{ Lect., } { Lab. }	Sedgwick . . . . .	V.	
605	General Zoology . . . . .	{ 2 } { 3 }	2	2 <sup>(1)</sup>	{ (600) (601) } { or (602) }	{ Lect., } { Lab. }	Weyse . . . . .	{ VII., IX. } { XI., XII. }	
606	General Botany . . . . .	{ 2 } { 3 }	2	1 <sup>(1)</sup>	{ (600) (601) } { or (602) }	{ Lect., } { Lab. }	Sedgwick, Prescott	{ VII., IX. } { XI., XII. }	
612	Comparative Anatomy and Embryology . . . . .	3	1, 2	8	(600) . . . . .	{ Lect., } { Rec., } { Lab. }	Weyse . . . . .	VII.	
614	Physiology of the Senses . . . . .	3	1	2	(603) . . . . .	{ Lect., } { Rec., } { Lab. }	Hough . . . . .	(VIII.)	

<sup>(1)</sup> Ten weeks for Course XI.

NATURAL SCIENCES.									
No.	Subject.	Year.	Term.	Hours per Week.	Preparation Required.	Method of Instruction.	Instructor in Charge.	Taken by	
615	Anthropology . . . . .	3	1	1	(605) . . . . .	Lect. . . . .	Sedgwick, Ripley . . . . .	VII, IX, XII.	
616	Cryptogamic Botany . . . . .	3	2	4	(600) . . . . .	{ Rec., } { Lab. }	Prescott . . . . .	VII.	
618	Journals . . . . .	4	1, 2	1	(600) . . . . .	Read. . . . .	Sedgwick, Hough	VII.	
619	Industrial Biology . . . . .	4	1	3	(600) or (604)	Lect. . . . .	Sedgwick, Keith . . . . .	(V.), VII.	
620	Comparative Physiology . . . . .	4	1, 2	5, 6	(612) . . . . .	{ Rec., } { Lab. }	Hough . . . . .	VII.	
621	Physiological Laboratory . . . . .	4	1, 2	4	(612) . . . . .	Lab. . . . .	Hough . . . . .	VII.	
622	Microscopic Anatomy . . . . .	4	1, 2	4, 3	(612) . . . . .	{ Lect. } { Rec., } { Lab. }	Hough . . . . .	VII.	
624	Theoretical Biology . . . . .	4	1, 2	1	(604) (612) . . . . .	Lect. . . . .	Bigelow . . . . .	VII.	
626	Physiology and Hygiene . . . . .	4	1	2	(600) . . . . .	{ Rec., } { Lab. }	Hough . . . . .	IX.	
627	History of Inductive Sciences . . . . .	4	1	1	(600) or (603)	Lect. . . . .	Sedgwick . . . . .	VII, VIII.	
628	Bacteriology . . . . .	4	1	{ 3 } { 4 }	(601) or (603)	{ Lect., } { Rec., } { Lab. }	Sedgwick, Prescott	{ (V.), VII. } { XI. }	
629	Sanitary Science and the Public Health . . . . .	4	2	1	(240) . . . . .	Lect. . . . .	Sedgwick . . . . .	{ I., IV, VII, IX, } { XI. }	
630	Sanitary Biology . . . . .	4	2	4	(628) . . . . .	{ Lect., } { Rec., } { Lab. }	Sedgwick . . . . .	(VII.), XI.	
631	Chemistry and Bacteriology of Water and Sewage . . . . .	4	2	1	(628) . . . . .	Lect. . . . .	{ Sedgwick, } { Mrs. Richards }	XI.	
632	Physiological Measurements . . . . .	4	2	6	(614) . . . . .	Lab. . . . .	Hough . . . . .	(VIII.)	

## Regulations.

---

**Second Year.** — The first term begins on the first Wednesday after September 25. There is a recess of one week after the semi-annual examinations, and the second term begins on the first Tuesday after February 4. On legal holidays, on the Friday and Saturday following Thanksgiving Day, and for three days at Christmas, and three in April, the exercises of the school are suspended.

### CALENDAR FOR 1896-97.

School Year began . . . . .	Wednesday, Sept. 30, 1896.
Semi-annual Examinations begin . . . . .	Tuesday, Jan. 19, 1897.
Second Term begins . . . . .	Tuesday, Feb. 9, 1897.
Annual Examinations begin . . . . .	Tuesday, May 25, 1897.
Degrees conferred. — School Year ends . . . . .	Tuesday, June 8, 1897.
First Entrance Examinations . . . . .	} Thursday, July 1, 1897, and } Friday, July 2, 1897.
Examinations for Advanced Standing begin . . . . .	Friday, Sept. 17, 1897.
Second Entrance Examinations <sup>1</sup> . . . . .	} Tuesday, Sept. 21, 1897, and } Wednesday, Sept. 22, 1897.
School Year of 1897-98 begins . . . . .	Wednesday, Sept. 29, 1897.

### CALENDAR FOR 1897-98.

School Year begins . . . . .	Wednesday, Sept. 29, 1897.
Semi-annual Examinations begin . . . . .	Tuesday, Jan. 18, 1898.
Second Term begins . . . . .	Tuesday, Feb. 8, 1898.
Annual Examinations begin . . . . .	Tuesday, May 24, 1898.
Degrees conferred. — School Year ends . . . . .	Tuesday, June 7, 1898.
First Entrance Examinations . . . . .	} Thursday, June 30, 1898, and } Friday, July 1, 1898.
Examinations for Advanced Standing begin . . . . .	Friday, Sept. 16, 1898.
Second Entrance Examinations <sup>1</sup> . . . . .	} Tuesday, Sept. 20, 1898, and } Wednesday, Sept. 21, 1898.
School Year of 1898-99 begins . . . . .	Wednesday, Sept. 28, 1898.

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

<sup>1</sup> See page 59.

**Examinations.**—A semi-annual examination is held in January, covering, in the third and fourth years, all the studies of the preceding term; and an annual examination in May, covering, in the third year, 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, as well as any professional work of previous years upon which it may be deemed best to hold examination. In the first and second years formal examinations are held at the same times but not in all subjects.

Examinations for students conditioned in June in subjects of the first, second, and third years, are held on the Friday and following days previous to the September entrance examinations, and for first term subjects, at the time of the annual examinations.

Intermediate examinations, the results of which are not made a matter of permanent record, but are primarily for the information of students and their parents or guardians, may be held at any time in place of regular exercises.

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

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

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.

**Reports of Standing.** — Intermediate informal reports are sent to students, and to the guardians of those not of age, for all first and second year subjects twice during each term. Formal semi-annual reports are sent at the close of each term. In connection with these reports special votes of the Faculty are transmitted in cases requiring consideration.

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

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

**Fees.** — The tuition fee for regular students is \$200 per year, and must be paid in advance, as follows, — \$125 on or before October 10, and \$75 on or before February 10. For one half or any less fraction of the school year, the fee is \$125. Payment is also required of the cost of chemicals used and 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,

application for reduction may be made to the Bursar. The fee for students in graduate courses is the same as that for regular students.

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

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

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

*Milton High School Scholarship.* Founded by the contributions of residents of Milton. This scholarship will be conferred upon such former pupil of the Milton High School as the master of that school and the school 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 forty free scholarships, one being assigned to each senatorial district 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, State House, 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 and Elisha Atkins Scholarship.* Founded by Mrs. Mary E. Atkins, of Boston, who has the right during her life to nominate the beneficiaries.

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

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

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

*William F. Huntington Scholarship.* Founded in memory of William F. Huntington, who graduated in Civil Engineering in the Class of '75. Preference will be given to a student in that course.

*T. Sterry Hunt Scholarships.* Founded by bequest of the late T. Sterry Hunt, for seven years Professor of Geology at the Institute; preference will be given chemical students of the higher years.

*Nichols Scholarship.* Founded by bequest of Mrs. Betsey F. M. Nichols in memory of her son, William Ripley Nichols, of the Class of '69, for sixteen years Professor of General

Chemistry at the Institute. Preference will be given to students in the Chemical course.

*Vose Fund.* By the will of Mrs. Ann White Vose, the Institute has recently received about fifty thousand dollars, the income of which is to be used for scholarships.

Any profits accruing from the rental of letter-boxes will be applied to the assistance of scholarship applicants.

**Conditions governing Award of Scholarships.** — Scholarships are awarded in general only to those applicants who have completed at least a year of thoroughly satisfactory work at the Institute. The facts considered in making assignments are the needs of the student and his promise as indicated by his previous work in the Institute. A student who is not greatly in need of aid cannot honorably apply for a scholarship, and none will be awarded to a student if, either from physical, mental, or moral weakness, he gives little promise of future usefulness. Awards will be made in October, and five-eighths of the amount awarded will be credited on the term bill due in October, and the remaining three-eighths on the term bill due in February. Applications for scholarships should be addressed to the Secretary of the Faculty.<sup>1</sup>

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

*Dalton Graduate Scholarship.* Founded by Charles H. Dalton, the income to be used for the payment of fees of American male students, graduates of the Institute, who may wish to pursue advanced chemical study and research, especially applicable to textile industries.

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

*James Savage Fellowship Fund.* Founded by the late James Savage. Four hundred dollars from the income of this fund will be annually awarded to a graduate student of

<sup>1</sup> Applications for Massachusetts State Scholarships should be made only to the Secretary of the State Board of Education, State House, Boston, from whom the necessary blanks may be obtained.

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

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

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

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

**Attendance.** — Regular students are expected to attend all the exercises of their several courses. Special students are expected to attend all the exercises in subjects applied for on their attendance cards, unless excused by special vote of the Faculty. Students are in general expected to devote themselves to the work of the school between the hours of 9 A. M. and 4 P. M., except during the interval from 1 P. M. to 2 P. M. There are no exercises on Saturday afternoon, and the rooms are closed.

**Conduct.** — It is assumed that students come to the Institute for a serious purpose, and that they will cheerfully conform to such regulations as may be from time to time made by the Faculty. In case of injury to the building, or to any of

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

# Register of Students.

---

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

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

---

## GRADUATE STUDENTS.

---

### FELLOWS.

#### SAVAGE FELLOWSHIP.

NAME.	HOME.	RESIDENCE.
Wendell, George Vincent . . .	<i>Cambridgeport</i> . . .	Studying abroad.
S.B., Massachusetts Institute of Technology.		

#### SWETT FELLOWSHIP.

Berry, Charles William . . .	<i>Somerville</i> . . .	Studying abroad.
S.B., Massachusetts Institute of Technology.		

---

## CANDIDATES FOR ADVANCED DEGREES.

NAME.	HOME.	RESIDENCE.
Bixby, George Linder . . .	<i>Foxboro</i> . . .	Foxboro.
S.B., Massachusetts Institute of Technology.		
Cummings, Henry, Jr. . . .	<i>Boston</i> . . .	3 Union Park.
S.B., Massachusetts Institute of Technology.		
Dodd, Margaret Eliot . . .	<i>Roxbury</i> . . .	58 Townsend St., R.
S.B., Massachusetts Institute of Technology.		

NAME.	HOME.	RESIDENCE.
Henry, Ralph Coolidge . . . . .	<i>Watertown</i> . . . . .	Watertown.
S.B., Massachusetts Institute of Technology.		
Keith, Simeon Curtis, Jr. . . . .	<i>Dorchester</i> . . . . .	4 Romsey St., D.
S.B., Massachusetts Institute of Technology.		
Smith, Herbert Edwards . . . . .	<i>Gloucester</i> . . . . .	670 Mass. Ave.
S.B., Massachusetts Institute of Technology.		
Smyser, Albert Ernest . . . . .	<i>Brookline</i> . . . . .	Brookline.
S.B., Massachusetts Institute of Technology.		
Smyser, James Swett . . . . .	<i>Brookline</i> . . . . .	Brookline.
S.B., Massachusetts Institute of Technology.		
Whitten, William Henry, Jr. . . . .	<i>Roxbury</i> . . . . .	59 School St., R.
S.B., Massachusetts Institute of Technology.		

## OTHER GRADUATE STUDENTS.

Anderson, Robert . . . . .	<i>Cincinnati, Ohio</i> . . . . .	19 W. Cedar St.
Ph.B., Yale University (S.S.S.).		
Andrews, George Frederick . . . . .	<i>Providence, R. I.</i> . . . . .	Providence, R. I.
A.M., Brown University.		
Beeson, Howard Jonathan . . . . .	<i>Akron, Ohio</i> . . . . .	415 Mass. Ave.
Ph.B., Colorado College.		
Blossom, David Henry . . . . .	<i>Granville, N. Y.</i> . . . . .	361 Columbus Ave.
A.B., Middlebury College.		
Brown, Dickson Queen . . . . .	<i>New York, N. Y.</i> . . . . .	1096 Boylston St.
A.B., Princeton University.		
Brown, Warren Day . . . . .	<i>New York, N. Y.</i> . . . . .	536 Mass. Ave.
A.B., Amherst College.		
Burr, Helen Louise . . . . .	<i>Melrose</i> . . . . .	Melrose.
B.A., Wellesley College.		
Chapman, James Finlay . . . . .	<i>Mankato, Minn.</i> . . . . .	Brookline.
B.S., Carleton College.		
Chase, Aurin Moody . . . . .	<i>Syracuse, N. Y.</i> . . . . .	4 Marlborough St.
B.S., Amherst College.		
Chase, Wendell Wyse . . . . .	<i>Foxcroft, Me.</i> . . . . .	250 Warren St., R.
B.C.E., Maine State College.		
Clark, Charles Bevan . . . . .	<i>Baltimore, Md.</i> . . . . .	146 Marlborough St.
A.B., Johns Hopkins University.		
Curtis, Harry Appleton . . . . .	<i>Boston</i> . . . . .	28 Mt. Vernon St.
A.B., Harvard University.		
Cutler, Jane Ruth . . . . .	<i>Somerville</i> . . . . .	Somerville.
A.B., Smith College.		
Daniels, Nathan Hagar, Jr. . . . .	<i>Boston</i> . . . . .	13 Joy St.
S.B., Massachusetts Institute of Technology.		
Darlington, William . . . . .	<i>Butte, Mont.</i> . . . . .	142 Chandler St.
M.E., Cornell University.		
Dater, Philip Herrick . . . . .	<i>Troy, N. Y.</i> . . . . .	69 Montgomery St.
B.A., Williams College.		
Deavitt, Henry McIntyre . . . . .	<i>Montpelier, Vt.</i> . . . . .	15 Claremont Park.
B.S., University of Vermont.		
Dodge, Edwin Sherrill . . . . .	<i>Newburyport</i> . . . . .	19 W. Cedar St.
A.B., Harvard University.		
Doty, George Francis . . . . .	<i>Pasadena, Cal.</i> . . . . .	25 Cortes St.
B.A., Throop Institute.		

NAME.	HOME.	RESIDENCE.
Elson, Arthur . . . . . A.B., Harvard University.	<i>Roxbury</i> . . . . .	79 Fort Ave. R.
Fletcher, David Colton . . . . . Ph.B., Yale University.	<i>Providence, R. I.</i> . . . . .	86 Huntington Ave.
Ferguson, Finlay Forbes . . . . . A.B., B.S., Hampden-Sidney College.	<i>Norfolk, Va.</i> . . . . .	1096 Boylston St.
Field, Leonard Hamilton, Jr. . . . . A.B., Amherst College.	<i>Jackson, Mich.</i> . . . . .	77 Appleton St.
Fifield, Ethel Frances . . . . . A.B., Smith College.	<i>Salem</i> . . . . .	Salem.
FitzGerald, John Watson . . . . . S.B., University of Michigan.	<i>Grand Rapids, Mich.</i> . . . . .	83 Montgomery St.
Frothingham, Brooks . . . . . A.B., Harvard University.	<i>Boston</i> . . . . .	339 Marlborough St.
Gilmore, Jonathan Monroe . . . . . B.S., University of California.	<i>Pasadena, Cal.</i> . . . . .	Wellesley Hills.
Godfrey, William Hollis . . . . . Ph.B., Tufts College.	<i>Needham</i> . . . . .	Needham.
Greenman, Bessie . . . . . B.A., Wellesley College.	<i>Mystic, Conn.</i> . . . . .	Arlington.
Guy, James Ringold . . . . . B.S., Virginia Polytechnic Institute.	<i>Norfolk, Va.</i> . . . . .	172 W. Brookline St.
Hayward, Nathan . . . . . A.B., Harvard University.	<i>Cambridge</i> . . . . .	Cambridge.
Heghinian, Garabed George . . . . . A.B., Central Turkey College.	<i>Marash, Turkey</i> . . . . .	Auburndale.
Hewitt, Edwin Hawley . . . . . A.B., University of Minnesota.	<i>Red Wing, Minn.</i> . . . . .	38 St. Botolph St.
Hoefler, Philo Remington . . . . . B.S., Norwich University.	<i>Ilion, N. Y.</i> . . . . .	413 Mass. Ave.
Horsey, Outerbridge, Jr. . . . . A.B., Georgetown University.	<i>Burkittsville, Md.</i> . . . . .	89 Charles St.
Howard, Arthur Fiske . . . . . B.S., Amherst College.	<i>Portsmouth, N. H.</i> . . . . .	215 W. Canton St.
Huntington, George Dunforth . . . . . A.B., University of Rochester.	<i>Rochester, N. Y.</i> . . . . .	387 Boylston St.
Hurd, Benjamin . . . . . S.B., Massachusetts Institute of Technology.	<i>Brookline</i> . . . . .	Brookline.
Jenkins, Lawrence Waters . . . . . A.B., Harvard University.	<i>Boston</i> . . . . .	125 St. Botolph St.
Johnson, Arthur Albert . . . . . A.B., Indianapolis University.	<i>Irvington, Ind.</i> . . . . .	Cambridge.
Lacy, Robert . . . . . A.B., Johns Hopkins University.	<i>Baltimore, Md.</i> . . . . .	146 Marlborough St.
Lansingh, Van Rensselaer . . . . . B.S., University of Chicago.	<i>Chicago, Ill.</i> . . . . .	31 St. Botolph St.
Lawrence, Amos Amory . . . . . A.B., Harvard University.	<i>Boston</i> . . . . .	59 Commonwealth Ave.
Lombard, Percival Hall . . . . . A.B., Harvard University.	<i>Boston</i> . . . . .	130 Newbury St.
Long, Margaret . . . . . A.B., Smith College.	<i>Hingham</i> . . . . .	Hingham.
Mable, Harry Saxton . . . . . B.P., Brown University.	<i>Roslindale</i> . . . . .	41 Brown Ave., Ros.

NAME.	HOME.	RESIDENCE.
McIver, Jean Bond . . . . .	Worcester . . . . .	Lynn.
B.S., Wellesley College.		
McKell, William . . . . .	Chillicothe, Ohio . . . . .	21 W. Cedar St.
Ph.B., Yale University (S.S.S.).		
Merrick, Charles Irving . . . . .	Holyoke . . . . .	91 Newbury St.
A.B., Harvard University.		
Nebel Herreros, Alejandro . . . . .	Santiago, Chile . . . . .	73 Dartmouth St.
B.S., University of Santiago.		
Neidich, Samuel Abrahims . . . . .	Carlisle, Pa. . . . .	A 1 Berwick Park.
Ph.B., Dickinson College.		
Nelson, Alexander Howard . . . . .	Chambersburg, Pa. . . . .	79 St. Botolph St.
A.B., Princeton University.		
O'Leary, William Henry Joseph . . . . .	Richibucto, N. B. . . . .	194 W. Brookline St.
A.M., Georgetown University.		
Oliver, Marshal Francis . . . . .	Annapolis, Md. . . . .	175 Mass. Ave.
A.B., St. John's College.		
Potts, Louis Joseph . . . . .	Charlestown . . . . .	Navy Yard, C.
A.B., Boston College.		
Putnam, William Edward, Jr. . . . .	Brookline . . . . .	Brookline.
A.B., Harvard University.		
Real y Gaillard, Juan . . . . .	Santiago de Cuba . . . . .	Webster Terrace, A.
A.B., Colegio de Carreras.		
Richardson, Philip . . . . .	Brookline . . . . .	Brookline.
A.B., Harvard University.		
Sargent, Homer Earle, Jr. . . . .	Chicago, Ill. . . . .	86 Huntington Ave.
Ph.B., Yale University (S.S.S.).		
Scudder, Heyward . . . . .	New York, N. Y. . . . .	437 Boylston St.
B.A., Trinity College.		
Smith, George Lawrence . . . . .	Cambridge . . . . .	Cambridge.
A.B., Harvard University.		
Smith, Harrison Willard . . . . .	Dorchester . . . . .	40 Mill St., D.
A.B., Harvard University.		
Stockton, Philip . . . . .	Boston . . . . .	390 Beacon St.
A.B., Harvard University.		
Stouder, John Burton . . . . .	Gravity, Iowa . . . . .	137 School St., R.
B.E., Drake University.		
Tinkham, Edgar Luther . . . . .	Providence, R. I. . . . .	7 Follen St.
B.P., Brown University.		
Tower, Samuel Francis . . . . .	Boston . . . . .	English High School.
A.B., Dartmouth College.		
Weaver, Erasmus Morgan . . . . .	Fort Warren . . . . .	Fort Warren.
Graduate U. S. Artillery School.		
Wessel, John Frederick . . . . .	Nashville, Tenn. . . . .	25 Cortes St.
A.B., Georgetown University.		
Wilson, Alda . . . . .	Harper, Iowa . . . . .	19 Claremont Park.
B.C.E., Iowa State College.		
Wilson, Elmina . . . . .	Harper, Iowa . . . . .	19 Claremont Park.
C.E., Iowa State College.		
Witherby, Edwin Chaplin . . . . .	Worcester . . . . .	4 Marlborough St.
S.B., Amherst College.		



## REGULAR STUDENTS.

## Fourth Year.

NAME.	COURSE.	HOME.	RESIDENCE.
Alden, John Trott . . . .	II.	<i>Newton</i> . . . . .	Newton.
Allen, Henry Walter . . . .	X.	<i>Boston</i> . . . . .	124 Newbury St.
Allen, William Henry, Jr. . .	XIII.	<i>Boston</i> . . . . .	293 Commonwealth Ave.
Anderson, Robert, Ph. B., . .	VI.	<i>Cincinnati, Ohio</i> . . . .	19 W. Cedar St.
Atwood, Thomas Clark . . . .	I.	<i>Malden</i> . . . . .	Malden.
Baldwin, Charles Fowler, Jr. .	VI.	<i>Mount Vernon, Ohio</i> . . . .	66 Rutland Sq.
Ballou, Henry Welcome . . . .	I.	<i>Providence, R. I.</i> . . . .	193 Warren Ave.
Bancroft, Wilfred . . . . .	II.	<i>Philadelphia, Pa.</i> . . . .	6 Louisburg Sq.
Barkhouse, Edgar Louis . . . .	VI.	<i>Louisville, Ky.</i> . . . .	38 St. Botolph St.
Barnes, Warren Hammond . . . .	I.	<i>Marlboro</i> . . . . .	Marlboro.
Barrows, Bernard . . . . .	X.	<i>Reading</i> . . . . .	Reading.
Beers, Herbert Page . . . . .	IV.	<i>Chicago, Ill.</i> . . . . .	531 Mass. Ave.
Binley, William, Jr. . . . .	XIII.	<i>Newburyport</i> . . . . .	Newburyport.
Blood, Percy Erford . . . . .	I.	<i>Graniteville</i> . . . . .	16 Rutland Sq.
Borland, Hugh . . . . .	I.	<i>St. Johnsbury, Vt.</i> . . . .	16 Rutland Sq.
Bowen, Edgar Campbell, Jr. . .	II.	<i>St. Paul, Minn.</i> . . . .	31 St. Botolph St.
Bowen, Ralph Albert . . . . .	V.	<i>Adams</i> . . . . .	35 Rutland Sq.
Boyd, John . . . . .	V.	<i>No. Adams</i> . . . . .	35 Rutland Sq.
Bradlee, Charles Walter . . . .	IX.	<i>Boston</i> . . . . .	113 Beacon St.
Brainerd, Edwin Alpheus . . . .	I.	<i>Dorchester</i> . . . . .	39 Olney St., D.
Bramhall, Charles Thomas . . . .	II.	<i>Plymouth</i> . . . . .	694 Tremont St.
Breed, Charles Blaney . . . . .	I.	<i>Lynn</i> . . . . .	Lynn.
Brown, Edward Percy . . . . .	III.	<i>Hatifax, N. S.</i> . . . . .	119 Appleton St.
Brown, James Monroe . . . . .	II.	<i>Mansfield, Ohio</i> . . . . .	66 W. Rutland Sq.
Brown, Warren Day, A. B. . . .	VI.	<i>New York, N. Y.</i> . . . . .	536 Mass. Ave.
Buell, Charles Seaton . . . . .	II.	<i>Chicago, Ill.</i> . . . . .	2 Aspen St., R.
Burdick, Howard Henry . . . . .	II.	<i>Hartford, Conn.</i> . . . . .	21 Claremont Park.
Burnham, George . . . . .	IV.	<i>Portland, Me.</i> . . . . .	563 Mass. Ave.
Busby, Fred Edward . . . . .	V.	<i>Adams</i> . . . . .	219 W. Canton St.
Bush, Walter Meiggs . . . . .	II.	<i>Brooklyn, N. Y.</i> . . . . .	21 Claremont Park.
Carty, John Edward . . . . .	I.	<i>Roxbury</i> . . . . .	6 Kensington St., R.
Clark, Charles Bevan, A. B. . . .	I.	<i>Baltimore, Md.</i> . . . . .	146 Marlborough St.
Clark, Henry Archer . . . . .	II.	<i>Pittsfield</i> . . . . .	134 W. Newton St.
Coleman, Ezra Abbott . . . . .	VI.	<i>Boston</i> . . . . .	193 W. Newton St.
Collins, John Arthur, Jr. . . . .	X.	<i>Fall River</i> . . . . .	37 St. Botolph St.
Cowles, Luzerne Simeon . . . . .	I.	<i>Hartford, Conn.</i> . . . . .	21 Claremont Park.

## FOURTH YEAR (continued).

NAME.	COURSE.	HOME.	RESIDENCE.
Crocker, Allen Swift . . .	II.	<i>New Bedford</i> . . .	28 E. Brookline St.
Currier, Charles Richardson	II.	<i>Jamaica Plain</i> . . .	282 Lamartine St., J.P.
Curtis, Arthur Vinton . . .	XIII.	<i>Quincy</i> . . . . .	Quincy.
Cutler, William Henry . . .	IV.	<i>Chicago, Ill.</i> . . . .	Brookline.
Cutter, Fred Bertram . . .	VI.	<i>Wakefield</i> . . . . .	Wakefield.
Daniell, Jere Rogers . . .	XIII.	<i>Franklin Falls, N. H.</i>	31 Appleton St.
Deavitt, Henry McIntyre, B.S.	V.	<i>Montpelier, Vt.</i> . . .	15 Claremont Park.
Demeritt, Leonard Morse . .	II.	<i>Natick</i> . . . . .	Natick.
Dodge, Edwin Sherrill, A.B.	IV.	<i>Newburyport</i> . . . .	19 W. Cedar St.
Doliber, Franklin Whitney	IX.	<i>Brookline</i> . . . . .	Brookline.
Doten, Alfred Russell . . .	II.	<i>Plymouth</i> . . . . .	Wollaston.
Dougherty, Proctor Lambert	VI.	<i>Cambridge</i> . . . . .	Cambridge.
Downes, Alfred Kimball . .	I.	<i>Gloucester</i> . . . . .	19 St. Botolph St.
du Pont, Irénée . . . . .	X.	<i>Wilmington, Del.</i> . .	531 Mass. Ave.
Dwyer, John Richard . . .	IV.	<i>St. Louis, Mo.</i> . . . .	32 Yarmouth St.
Eames, Charles Holmes . . .	VI.	<i>Andover</i> . . . . .	Andover.
Eaton, William Wise . . . .	II.	<i>Bridgewater</i> . . . . .	549 Mass. Ave.
Edmands, Frederick Lincoln	II.	<i>Newburyport</i> . . . .	Parker Hill Ave., R.
Elson, Arthur, A.B. . . . .	X.	<i>Roxbury</i> . . . . .	79 Fort Ave., R.
Everett, Frank Warren . . .	VI.	<i>Highland Park, Ill.</i> .	531 Mass. Ave.
Ewen, Malcolm Faulkner . .	IV.	<i>Boston</i> . . . . .	194 Huntington Ave.
Ewing, William Clinton . . .	VI.	<i>Danvers</i> . . . . .	466 Mass. Ave.
Fairbanks, William Kendall	VI.	<i>Boston</i> . . . . .	213 Newbury St.
Faxon, William Aleck . . . .	V.	<i>Buffalo, N. Y.</i> . . . .	543 Mass. Ave.
Feeley, Frank Goodrich . . .	II.	<i>Pittsfield</i> . . . . .	Brookline.
Ferris, Robert Murray, Jr. .	VI.	<i>Poughkeepsie, N. Y.</i>	29 Concord Sq.
Fiske, George Isaac . . . . .	VI.	<i>Roxbury</i> . . . . .	50 Elmore St., R.
FitzGerald, John Watson, S.B.	VI.	<i>Grand Rapids, Mich.</i>	83 Montgomery St.
Frank, Mortimer . . . . .	I.	<i>Chicago, Ill.</i> . . . . .	191 Huntington Ave.
Franklin, Arthur Ira . . . . .	V.	<i>Newton</i> . . . . .	Newton.
Gaillard, Lawrence Lee . . .	VI.	<i>Charleston, S. C.</i> . . .	183 Warren Ave.
Gilmore, Jonathan M., B.L.	VI.	<i>Pasadena, Cal.</i> . . . .	Wellesley Hills.
Gleason, Walter Austin . . .	I.	<i>Malden</i> . . . . .	Malden.
Goodspeed, George Marston	V.	<i>Hyde Park</i> . . . . .	Hyde Park.
Gowen, Sumner . . . . .	I.	<i>Wakefield</i> . . . . .	Wakefield.
Gray, Owen Herrick . . . . .	VI.	<i>St. Paul, Minn.</i> . . . .	134 W. Newton St.
Guttridge, James Addison . .	I.	<i>Roslindale</i> . . . . .	Garden St., Ros.
Hall, Robert George . . . . .	V.	<i>Pittsburgh, Pa.</i> . . . .	221 W. Canton St.
Hamilton, Alfred Starr . . .	IX.	<i>Albany, N. Y.</i> . . . . .	175 Mass. Ave.
Hammond, Charles Lincoln . .	I.	<i>Atlantic</i> . . . . .	Atlantic.
Haskins, Charles Nelson . . .	VIII.	<i>New Bedford</i> . . . . .	122 Chandler St.
Hatch, Israel, Jr. . . . .	X.	<i>Hanover</i> . . . . .	143 W. Canton St.
Hawkins, Edgar Marvin . . . .	II.	<i>W. Roxbury</i> . . . . .	107 Maple St., W. R.
Hayward, Nathan, A.B. . . .	VI.	<i>Cambridge</i> . . . . .	Cambridge.
Hayward, Royal Hobart . . .	VI.	<i>Roxbury</i> . . . . .	18 Holborn St., R.

## FOURTH YEAR (continued).

NAME.	COURSE.	HOME.	RESIDENCE.
Healey, Benjamin Francis . . .	VI.	<i>Boston</i> . . . . .	602 Tremont St.
Healy, Frederick Elliott . . .	II.	<i>E. Providence, R. I.</i> . . .	28 E. Brookline St.
Hemmings, Frederick John . . .	V.	<i>Boston</i> . . . . .	9 Sussex St.
Hering, Oswald Constantin . . .	IV.	<i>New York, N. Y.</i> . . . . .	563 Mass. Ave.
Hill, William Gilbert, Jr. . . .	V.	<i>Malden</i> . . . . .	Malden.
Hopkins, Arthur Thomas . . . .	XI.	<i>Somerville</i> . . . . .	Somerville.
Hosford, Roger Fuller . . . . .	V.	<i>Boston</i> . . . . .	19 Burlington Ave.
Howard, Ethan Henry . . . . .	VI.	<i>Buffalo, N. Y.</i> . . . . .	549 Mass. Ave.
Howes, Benjamin Alfred . . . .	VI.	<i>Keene, N. H.</i> . . . . .	167 Warren Ave.
Howland, Richard Stanley . . .	IX.	<i>Providence, R. I.</i> . . . . .	4 Oxford Terrace.
Hubbard, Chester Dimock . . . .	VI.	<i>Boston</i> . . . . .	134 W. Newton St.
Humphreys, Walter . . . . .	II.	<i>Dorchester</i> . . . . .	Humphreys Pl., D.
Hunnewell, Frederick Allen . . .	XIII.	<i>No. Cambridge</i> . . . . .	No. Cambridge.
Hunt, Harry Burleigh . . . . .	II.	<i>Brooklyn, N. Y.</i> . . . . .	1096 Boylston St.
Hunt, Harry Draper . . . . .	IX.	<i>No. Attleboro</i> . . . . .	468 Boylston St.
Hurd, Benjamin, S B. . . . .	II.	<i>Brookline</i> . . . . .	Brookline.
Ilsley, John Parker, Jr. . . . .	II.	<i>Philadelphia, Pa.</i> . . . . .	6 Louisburg Sq.
Jackson, Henry Docker . . . . .	VI.	<i>Boston</i> . . . . .	Hotel Oxford.
Jacobs, Elbridge Churchill . . .	III.	<i>Malden</i> . . . . .	Malden.
Jennings, Arthur Lewis . . . . .	II.	<i>Deep River, Conn.</i> . . . . .	8 Concord Sq.
Keisker, Frank Henry . . . . .	IV.	<i>Louisville, Ky.</i> . . . . .	138 W. Newton St.
Kent, William Albert . . . . .	I.	<i>Boston</i> . . . . .	496 Columbus Ave.
Killam, James Warren . . . . .	I.	<i>Reading</i> . . . . .	33 Union Park.
Kimberly, Albert Elliott . . . .	V.	<i>Jamaica Plain</i> . . . . .	8 Lester Pl., J. P.
King, William Braman . . . . .	VI.	<i>Dorchester</i> . . . . .	11 Merlin St., D.
Knight, George Horace . . . . .	II.	<i>Hudson</i> . . . . .	234 W. Canton St.
Lamb, Augustus Clark . . . . .	X.	<i>Cambridge</i> . . . . .	Cambridge.
Lawler, George Sherriffs . . . .	VI.	<i>E. Boston</i> . . . . .	259 Webster St., E. B.
Leach, William Henry, Jr. . . . .	II.	<i>Brooklyn, N. Y.</i> . . . . .	Cambridgeport.
Learned, Ernest Freeman . . . .	VI.	<i>Watertown</i> . . . . .	Watertown.
Le Baron, Frederic Nelson . . . .	IV.	<i>Middleboro</i> . . . . .	549 Mass. Ave.
Lee, William Louis . . . . .	VI.	<i>Evanston, Ill.</i> . . . . .	22 Yarmouth St.
Lewis, James Edward . . . . .	I.	<i>Somerville</i> . . . . .	Somerville.
Loomis, Henry Meech . . . . .	V.	<i>Yokohama, Japan</i> . . . . .	130 W. Newton St.
Loveland, Benjamin Alpheus . . .	I.	<i>Chatham</i> . . . . .	Chelsea.
Lunt, Robert Somerby . . . . .	X.	<i>Newburyport</i> . . . . .	41 Salcombe St., D.
Maguire, Thos. Francis James . .	VI.	<i>Dorchester</i> . . . . .	8 Beale St., D.
Mahoney, Joseph Michael . . . .	VI.	<i>Dorchester</i> . . . . .	21 Bailey St., D.
Manson, Edmund Sewall, Jr. . . .	VIII.	<i>Dorchester</i> . . . . .	7 Holiday St., D.
Marshall, Herman Weston . . . .	VII.	<i>Brockton</i> . . . . .	127 W. Newton St.
Mason, Earl Potter . . . . .	II.	<i>Newport, R. I.</i> . . . . .	28 Brimmer St.
McCarthy, George Herbert . . . .	IX.	<i>Dorchester</i> . . . . .	76 Chestnut St.
McCormick, Edmund Burke . . . .	II.	<i>Normal, Ill.</i> . . . . .	114 W. Concord St.
McMillan, John Primrose . . . .	X.	<i>Petrolia, Ont.</i> . . . . .	145 W. Newton St.
Moran, George Austin . . . . .	V.	<i>So. Framingham</i> . . . . .	So. Framingham.

## FOURTH YEAR (continued).

NAME.	COURSE.	HOME.	RESIDENCE.
Motch, Edward Raymond . . .	II.	<i>Covington, Ky.</i>	198 W. Springfield St.
Mulhall, Harold Torrey . . .	VI.	<i>Dorchester</i>	9 Laurel St., D.
Nickerson, Clarendon . . .	X.	<i>Bridgeport, Conn.</i>	25 Rockville Park, R.
Noble, Howard Agnew . . .	II.	<i>Pittsburgh, Pa.</i>	543 Mass. Ave.
Norris, Albert Perley . . .	V.	<i>Cambridgeport</i>	Cambridgeport.
Olin, Edwin Read . . .	X.	<i>Roxbury</i>	29 St. James St., R.
Oliver, Marshal Francis, A.B.	IV.	<i>Annapolis, Md.</i>	175 Mass. Ave.
Orr, Hugh . . .	IV.	<i>Brockton</i>	Brockton.
Osgood, Edwin Putnam . . .	XI.	<i>Boston</i>	200 W. Brookline St.
Paine, Charles Bodwell . . .	IV.	<i>Augusta, Me.</i>	15 St. Germain St.
Parker, William Thornton, Jr.	IX.	<i>Springfield</i>	6 Louisburg Sq.
Parsons, Archibald Livingstone	I.	<i>Derry, N. H.</i>	33 Union Park.
Pechin, John Shelley . . .	II.	<i>Cleveland, Ohio</i>	21 W. Cedar St.
Peirce, Vernon Marshall . . .	I.	<i>Boston</i>	169 W. Newton St.
Pettee, Charles Leslie Wight	V.	<i>Newtonville</i>	Newtonville.
Pike, Otto Samuel . . .	II.	<i>Malden</i>	Malden.
Potter, William Chapman . . .	III.	<i>Chicago, Ill.</i>	563 Mass. Ave.
Pratt, Gilbert Homer . . .	V.	<i>Chelsea</i>	Chelsea.
Pugh, Achilles Henry . . .	X.	<i>Cincinnati, Ohio</i>	31 St. Botolph St.
Reed, William Edgar . . .	VI.	<i>Pittsburgh, Pa.</i>	167 Warren Ave.
Richards, Louis Jerome . . .	XI.	<i>Norwich, Conn.</i>	79 Montgomery St
Robinson, Elmer Holbrook	VI.	<i>Reading</i>	Reading.
Robinson, Laforest George	VI.	<i>Plattsburg, N. Y.</i>	Cambridge.
Rogerson, John Russell . . .	I.	<i>Mansfield</i>	Mansfield.
Rooke, Warren Augustus . . .	IV.	<i>Meriden, Conn.</i>	32 Yarmouth St.
Royce, James Charles . . .	II.	<i>Davenport, Ont.</i>	145 W. Newton St.
Russell, Walter Basford . . .	II.	<i>Roxbury</i>	4 Paulding St., R.
Sawin, Luther Robinson . . .	V.	<i>Waltham</i>	Waltham.
Sawtelle, Harry Francis . . .	I.	<i>Cambridgeport</i>	Cambridgeport.
Sawtelle, William Otis . . .	VIII.	<i>Bangor, Me.</i>	563 Mass. Ave.
Schuttler, Carl . . .	II.	<i>Chicago, Ill.</i>	543 Mass. Ave.
Schwartz, David . . .	V.	<i>Boston</i>	10 Wall St.
Sellew, William Hamilton . . .	II.	<i>Cincinnati, Ohio</i>	5 Oxford Terrace.
Sherman, Henry Arthur . . .	III.	<i>Boston</i>	470 Mass. Ave.
Shuman, Jesse Wyman . . .	VI.	<i>Minneapolis, Minn.</i>	13 Greenwich Park.
Smith, Harrison W., A.B.	II., VI.	<i>Dorchester</i>	40 Mill St., D.
Smith, James Wilfred . . .	XIII.	<i>Lawrence</i>	Lawrence.
Smith, Oren Barron, Jr. . . .	III.	<i>Northampton</i>	100 Pembroke St.
Smith, Percy Merrihew . . .	II.	<i>Rockland</i>	165 Huntington Ave.
Smith, William Franklin . . .	II.	<i>No. Cambridge</i>	No. Cambridge.
Smith, William Graves . . .	I.	<i>Mansfield</i>	Mansfield.
Spear, Walter Evans . . .	XI.	<i>Lawrence</i>	Lawrence.
Spiess, Arthur Douglas . . .	IV.	<i>New York, N. Y.</i>	398 Boylston St.
Spring, Russell Clark . . .	IV.	<i>Newton Lower Falls</i>	Newton Lower Falls.
Starbuck, George Franklin . . .	II.	<i>Waltham</i>	Waltham.

FOURTH YEAR (*continued*).

NAME.	COURSE.	HOME.	RESIDENCE.
Stebbins, Charles Bowles	XIII.	<i>Somerville</i>	Somerville.
Steiner, Klaus Junior	III.	<i>Allegheny, Pa.</i>	5 Oxford Terrace.
Stiles, Percy Goldthwait	VII.	<i>Newtonville</i>	Newtonville.
Taylor, John	VI.	<i>Brookline</i>	Brookline.
Thomson, Mary Jane	V.	<i>Elizabeth, N. J.</i>	41 Union Park.
Tinkham, Edgar Luther, B.P.	VI.	<i>Providence, R. I.</i>	7 Follen St.
Tone, Jay Erwin	X.	<i>Des Moines, Ia.</i>	37 St. Botolph St.
Trumbull, Morris Kinnard	I.	<i>Chicago, Ill.</i>	23 Cumberland St.
Tyler, Lucius Spaulding	VI.	<i>Waltham</i>	1100 Boylston St.
Videto, Theodore Ernest	IV.	<i>So. Framingham</i>	So. Framingham.
Vinal, Ralph Sumner	IV.	<i>Brockton</i>	Brockton.
Wadleigh, George Robinson	II.	<i>W. Newton</i>	W. Newton.
Walther, William John	I.	<i>Chicago, Ill.</i>	24 Yarmouth St.
Washburn, Thurlow	III.	<i>Cambridge</i>	Cambridge.
Watts, Francis Henry	I.	<i>Natick</i>	Natick.
Weymouth, Thomas Rote	VI.	<i>Lock Haven, Pa.</i>	549 Mass. Ave.
Whiton, David Thomas	II.	<i>Hingham Centre</i>	Hingham Centre.
Wood, Florence Anna	VIII.	<i>Roxbury</i>	9 Bainbridge St., R.
Wood, William Remington	XIII.	<i>Providence, R. I.</i>	194 W. Brookline St.
Woodman, Alpheus Grant	V.	<i>Essex</i>	4 Union Park St.
Woodman, George Maddock	I.	<i>Essex</i>	4 Union Park St.
Woodworth, Edward Harold	V.	<i>Newtonville</i>	Newtonville.
Woodyatt, Ernest	IV.	<i>Evanston, Ill.</i>	21 W. Cedar St.

## Third Year.

Alexander, Donald Nelson	IV.	<i>E. Boston</i>	33 Falcon St., E. B.
Alland, Leon	I.	<i>Roxbury</i>	8 Gaston St. R.
Allyn, Robert	II.	<i>New London, Conn.</i>	8 Concord Sq.
Arnold, Lyman	VI.	<i>W. Springfield</i>	103 Appleton St.
Ayres, Milan Valentine	VI.	<i>Newton Centre</i>	Newton Centre.
Babson, Roger Ward	I.	<i>Gloucester</i>	6 Rollins St.
Bacon, Lyman Edward	I.	<i>Bridgewater</i>	Bridgewater.
Barker, Elliott Rensselaer	V.	<i>Greendale</i>	114 White St., E. B.
Barker, Harrington	II.	<i>No. Cambridge</i>	No. Cambridge.
Belcher, Henry Clifford	II.	<i>Easton</i>	Easton.
Bennink, Carroll Augustus	IV.	<i>Ontario, Cal.</i>	Cambridge.
Benson, Howard Jona, Ph. B.	III.	<i>Akron, Ohio.</i>	415 Mass. Ave.
Bergen, Francis Patrick	VI.	<i>Hartford, Conn.</i>	694 Mass. Ave.
Bergstrom, George Edwin	IV.	<i>Neenah, Wis.</i>	389 Beacon St.
Bishop, Frederic Lendall	VIII.	<i>Malden</i>	Malden.
Bissell, Thomas Hally	VI.	<i>Buffalo, N. Y.</i>	4 Oxford Terrace.
Blackmer, William Daniels	III.	<i>Colorado Springs, Colo.</i>	543 Mass. Ave.
Blanchard, Arthur Alphonzo	V.	<i>Newton Centre</i>	Newton Centre.
Bleecker, John Stearns	II.	<i>Boston</i>	6 Louisburg Sq.

## THIRD YEAR (continued).

NAME.	COURSE.	HOME.	RESIDENCE.
Blood, George Whitefield . . .	IV.	Newburyport . . .	Newburyport.
Blossom, David Henry, A.B. . .	I.	Granville, N. Y. . .	361 Columbus Ave.
Boardman, Fred Cleveland . . .	VI.	Natick . . . . .	Natick.
Bodwell, Howard Lawrence . . .	II.	W. Boxford . . . .	335 Columbus Ave.
Booth, George Henry . . . . .	II.	Poughkeepsie, N. Y. . .	194 W. Brookline St.
Boyle, Martin . . . . .	V.	Newburyport . . . .	Newburyport.
Brewster, William . . . . .	II.	Plymouth . . . . .	Plymouth.
Brooks, Miles Elijah . . . . .	I.	Boston . . . . .	19 Milford St.
Butcher, William Laramy . . . .	I.	Cambridge . . . . .	Cambridge.
Butler, Winthrop Fessenden . . .	V.	Chelsea . . . . .	Chelsea.
Byam, Le Roy Henry . . . . .	I.	Waltham . . . . .	Waltham.
Cade, Marion Louise . . . . .	V.	Cambridgeport . . . .	Cambridgeport.
Campbell, Donald Chenery . . . .	II.	Lowell . . . . .	13 Greenwich Park.
Chace, Ira Mason, Jr. . . . .	I.	New Bedford . . . . .	53 Morton St., D.
Chapin, Edward Samuel . . . . .	V.	Boston . . . . .	23 Parker St.
Cleaveland, Walter Avery . . . .	II.	W. Newton . . . . .	W. Newton.
Clifford, Paul . . . . .	II.	Newton . . . . .	Newton.
Cobb, Herbert Franklin . . . . .	II.	Newton Centre . . . .	Newton Centre.
Coburn, Howard Lincoln . . . . .	II.	Boston . . . . .	143 Appleton St.
Coffin, Joseph George . . . . .	VIII.	Boston . . . . .	635 Tremont St.
Colcord, Frank Forest . . . . .	III.	Roxbury . . . . .	3 Weld Ave., R.
Conklin, Herbert King . . . . .	IV.	Newark, N. J. . . . .	314 Columbus Ave.
Coombs, Frank Eugene . . . . .	IV.	E. Boston . . . . .	26 Maverick St., E. B.
Cornell, Worthington . . . . .	VI.	Wellington . . . . .	Wellington.
Cottle, George Thurston . . . . .	V.	Roxbury . . . . .	13 Copley St., R.
Crane, Eva Hayes . . . . .	IV.	Cambridge . . . . .	Cambridge.
Crowell, Luther Alberto . . . . .	VI.	W. Dennis . . . . .	22 Berwick Park.
Currier, Harvey Leon . . . . .	II.	Swampscott . . . . .	Lynn.
Curtis, Everett Nichols . . . . .	IX.	Boston . . . . .	26 Cumberland St.
Dana, Wm. Sumner Barton . . . .	IV.	Worcester . . . . .	2 St. Botolph St.
Danforth, Raymond Hewes . . . .	II.	Salem . . . . .	Salem.
Dater, Philip Herrick, B.A. . . .	I.	Troy, N. Y. . . . .	69 Montgomery St.
Davis, Alvan Lamson . . . . .	III.	Hyde Park . . . . .	Hyde Park.
Davis, Arthur True . . . . .	II.	Portland, Me. . . . .	151 Appleton St.
Davis, Huntly Ward . . . . .	IV.	Montreal, Que. . . . .	549 Mass. Ave.
Davison, George Rupert . . . . .	VI.	So. Boston . . . . .	33 M St., S. B.
Dixon, John Brown . . . . .	V.	Washington, D. C. . . .	32 Lawrence St.
Dodge, Irving Bigelow . . . . .	II.	Grafton . . . . .	Newton.
Doty, George Francis, B.A. . . . .	VI.	Pasadena, Cal. . . . .	25 Cortes St.
Draper, Robert May . . . . .	III.	Fayville . . . . .	Fayville.
Edgerly, Daniel Wilbert . . . . .	V.	Cambridgeport . . . .	Cambridgeport.
Fearing, Albert Justin . . . . .	I.	So. Weymouth . . . . .	So. Weymouth.
Ferguson, Finlay F., A.B., B.S. . .	IV.	Norfolk, Va. . . . .	1096 Boylston St.
Fisher, Howell . . . . .	X.	Roxbury . . . . .	105 Howland St., R.
Fleisher, Simon . . . . .	VI.	Boston . . . . .	24 Norman St.

## THIRD YEAR (continued).

NAME.	COURSE.	HOME.	RESIDENCE.
Forrest, Mabel Flora . . .	VII.	Lowell . . . . .	Somerville.
Fownes, William Clark . . .	X.	Pittsburgh, Pa. . . .	Brookline.
Frye, Albert Irvin . . . .	I.	Alameda, Cal. . . . .	79 Chandler St.
Garrison, Ernest Augustus . .	II.	Chelsea . . . . .	Chelsea.
Godbold, Charles Henry, Jr. XIII.		E. Boston . . . . .	150 Trenton St., E. B.
Goddard, John Newton . . .	V.	Plainfield, N. J. . . .	466 Mass. Ave.
Godley, George McMurtrie . .	III.	New York, N. Y. . . .	563 Mass. Ave.
Goodrich, Arthur Lindsay . .	X.	Stockbridge . . . . .	155 Warren Ave.
Grosvenor, Asa Waters . . .	II.	Amherst . . . . .	31 St. Botolph St.
Guy, James Ringold, B.S. . .	II.	Norfolk, Va. . . . .	172 W. Brookline St.
Hazeltine, James Ezra . . .	VI.	Warren, Pa. . . . .	22 Union Park.
Hewins, Lyman Foster . . .	XIII.	Dorchester . . . . .	353 Washington St., D.
High, Carl Stout . . . . .	VI.	Arlington, Kans. . . .	678 Tremont St.
Hinckley, Benjamin Stearns . .	II.	Woburn . . . . .	Woburn.
Hooker, Stanley Agar . . .	II.	Cincinnati, Ohio . . . .	38 St. Botolph St.
Hopkins, Heber Augustus . .	II.	Cambridgeport . . . .	Cambridgeport.
Horsley, Outerbridge, Jr., A.B. VI.		Burkittsville, Md. . . .	89 Charles St.
Horton, Ralph Tucker . . .	I.	Foxboro . . . . .	Foxboro.
Howard, Arthur Fiske, B.S. .	VI.	Portsmouth, N. H. . . .	215 W. Canton St.
Hubbard, Winfred Dean . . .	XI.	Concord . . . . .	Concord.
Huntington, Geo. Danforth, A.B. I.		Rochester, N. Y. . . . .	387 Boylston St.
Hutchinson, George Anthony .	II.	Dorchester . . . . .	14 Wales St., D.
Ingalls, Harry Creighton . .	IV.	Lynn . . . . .	Lynn.
Jacoby, Arelí Hull . . . . .	V.	Wilkes-Barre, Pa. . . .	23 Worcester Sq.
Johnson, Edward, Jr. . . . .	I.	Boston . . . . .	178 Marlborough St.
Johnson, Paul Franklin . . .	II.	Boston . . . . .	67 Westland Ave.
Jones, Frederic Alexander . .	I.	Needham . . . . .	Needham.
Kaufman, Irvin Hayes . . .	II.	Brookline . . . . .	Brookline.
Keene, Arthur Samuel . . .	IV.	Brighton . . . . .	41 Murdock St., B.
Kellogg, Franklin Miner . . .	VI.	W. Stafford, Conn. . . .	86 Myrtle St.
Kendall, Robert Everett . . .	V.	Hyde Park . . . . .	Hyde Park.
Kimball, Walter Everard . . .	XIII.	Dorchester . . . . .	1 Robin Hood St., D.
Koch, Carleton Spayth . . .	V.	Buffalo, N. Y. . . . .	543 Mass. Ave.
Kuttruff, Edwin . . . . .	X.	New York, N. Y. . . . .	719 Boylston St.
Lacy, Robert, A.B. . . . .	I.	Baltimore, Md. . . . .	146 Marlborough St.
Lane, Edward Percy . . . .	I.	Manchester . . . . .	210 W. Canton St.
Langford, Grace . . . . .	VIII.	Plymouth . . . . .	10 Concord Sq.
Lawley, Arthur Crosbie . . .	II.	So. Boston . . . . .	60 N St., S. B.
Lee, Walter Henry . . . . .	IV.	Home City, Ohio . . . .	39 St. Botolph St.
Leonard, Owen Lewis . . .	V.	Newton Centre . . . . .	Newton Centre.
Lippincott, Jesse Treadwell .	X.	Cincinnati, Ohio . . . .	28 St. James Ave.
Little, Edmund Cook . . . .	IV.	Lowell . . . . .	215 W. Canton St.
Lombard, Percival Hall, A.B. VI.		Boston . . . . .	130 Newbury St.
Lord, Charles Edward . . .	VI.	Somerville . . . . .	Somerville.
Lord, Herbert Ivory . . . .	V.	Roxbury . . . . .	75 Howard Ave., R.

## THIRD YEAR (continued).

NAME.	COURSE.	HOME.	RESIDENCE.
Loring, Conrad . . . .	II.	<i>Kobe, Japan</i> . . . .	8 Arlington St.
Lovejoy, Walter Livingston	III.	<i>Buffalo, N. Y.</i> . . . .	17 Concord Sq.
Marshall, William Adamson	X.	<i>Brookline</i> . . . .	Brookline.
Mathews, George Eugene .	IV.	<i>Dayton, Ohio</i> . . . .	29 Appleton St.
Mayer, Durand . . . .	VI.	<i>New York, N. Y.</i> . . . .	678 Tremont St.
McConnell, Walter Gardner	XIII.	<i>Roxbury</i> . . . .	516 Warren St., R.
McIntyre, James Sherwood	IV.	<i>New Bedford</i> . . . .	678 Tremont St.
McJunkin, Paul . . . .	VIII.	<i>Roxbury</i> . . . .	62 Sherman St., R.
Milliken, Sumner Moulton .	I.	<i>Saco, Me.</i> . . . .	105 Warren Ave.
Mills, Prescott Caldwell . .	II.	<i>Arlington</i> . . . .	Arlington.
Moebis, Joseph Julius . . .	I.	<i>Dorchester</i> . . . .	235 Magnolia St., D.
Morgan, Carl Leon . . . .	VI.	<i>Fitchburg</i> . . . .	21 Claremont Park.
Morrill, Edward Francis . .	VI.	<i>Fitchburg</i> . . . .	4 Oxford Terrace.
Muhlig, James Fred . . . .	II.	<i>Natick</i> . . . .	Natick.
Neidich, Samuel A., Ph.B.	II., X.	<i>Carlisle, Pa.</i> . . . .	A 1 Berwick Park.
Nelson, Willard Bundy . . .	VI.	<i>Jamaica Plain</i> . . . .	14 Boylston Ter., J. P.
Newbury, George Kellogg	XIII.	<i>Jackson, Mich.</i> . . . .	107 Mt. Vernon St.
Newhall, Henry Borden, Jr.	VI.	<i>Plainfield, N. J.</i> . . . .	531 Mass. Ave.
Osgood, Henry Douglas . . .	XI.	<i>Boston</i> . . . .	200 W. Brookline St.
Packard, Alpheus Appleton	XIII.	<i>Providence, R. I.</i> . . . .	146 Marlborough St.
Packard, Leonard Warren . .	VI.	<i>Taunton</i> . . . .	Taunton.
Page, Walter . . . .	XIII.	<i>Boston</i> . . . .	253 Beacon St.
Paige, Ellwood Bryant . . .	IV.	<i>Lynn</i> . . . .	Lynn.
Parker, Will Rogers . . . .	VI.	<i>Portsmouth, N. H.</i> . . . .	31 Centre St., R.
Pease, Charles Henry . . . .	II.	<i>Marlboro, N. H.</i> . . . .	234 W. Canton St.
Peavey, Leroy Deering . . .	I.	<i>Exeter, N. H.</i> . . . .	Malden.
Pendell, Charles William . .	VI.	<i>Cleburne, Tex.</i> . . . .	130 W. Brookline St.
Perry, Frank Bridgman . . .	II.	<i>Norwich, Conn.</i> . . . .	136 Chandler St.
Philbrick, Shirley Seavey . .	II.	<i>Rye Beach, N. H.</i> . . . .	83 Dartmouth St.
Porter, Arthur Felix . . . .	V.	<i>Hyde Park</i> . . . .	Hyde Park.
Pratt, Robert Winthrop, Jr.	I.	<i>Waban</i> . . . .	Waban.
Priest, Benson Bulkeley . . .	I.	<i>Littleton</i> . . . .	Littleton.
Putnam, Wm. Edward, Jr., A.B.	IV.	<i>Brookline</i> . . . .	Brookline.
Richardson, Edward Bridge	VI.	<i>Boston</i> . . . .	155 Beacon St.
Richmond, Henry Parsons . .	IV.	<i>E. Providence, R. I.</i> . . . .	335 Columbus Ave.
Riley, Joseph Cains, Jr. . . .	II.	<i>Roslindale</i> . . . .	Allen St., Ros.
Robinson, John Tilden, Jr. .	II.	<i>Hyde Park</i> . . . .	Hyde Park.
Robinson, Wm. Attmore, Jr.	II.	<i>New Bedford</i> . . . .	Pond St., J. P.
Russ, Ernest Frank . . . .	IX.	<i>Boston</i> . . . .	193 W. Brookline St.
Russell, Benjamin F. W. . . .	IV.	<i>Concord Junction</i> . . . .	Cambridge.
Schroeder, Ernest Herman . .	IV.	<i>Omaha, Neb.</i> . . . .	678 Tremont St.
Scott, Henry Francis . . . .	II.	<i>Brockton</i> . . . .	Brockton.
Sears, Joseph Homer . . . .	V.	<i>E. Dennis</i> . . . .	22 Claremont Park.
Seidensticker, Lewis Jerome	V.	<i>Cambridge</i> . . . .	Cambridge.
Shaw, Albion Walker . . . .	VI.	<i>Malden</i> . . . .	Malden.



THIRD YEAR (*continued*).

NAME.	COURSE.	HOME.	RESIDENCE.
Shedd, Albert Rix . . . .	II.	<i>Silver Creek, N. Y.</i>	23 Worcester Sq.
Sherman, Edward Clayton .	I.	<i>Cambridge</i>	Cambridge.
Skinner, Charles Jernegan .	I.	<i>Ottawa, Kans.</i>	664 Tremont St.
Smith, Charles Franklin . .	XI.	<i>Washington, D. C.</i>	21 Claremont Park.
Smith, Charles Henry . . .	II.	<i>Charlestown</i>	107 Warren St., C.
Smith, Godfrey Lewis . . .	XIII.	<i>Roxbury</i>	1 Elmwood St., R.
Smith, Horace Tilden . . .	V.	<i>E. Bridgewater</i>	E. Bridgewater.
Spaulding, Frank Alger . .	I.	<i>W. Stockbridge</i>	159 W. Canton St.
Staples, William Deering . .	VI.	<i>Portland, Me.</i>	21 Claremont Park.
Steffens, William Frederick .	I.	<i>Boston</i>	137 W. Concord St.
Stevens, Gorham Phillips . .	IV.	<i>Cambridge</i>	Cambridge.
Stevens, William Wentworth	IV.	<i>Lynn</i>	Lynn.
Streng, Lewis Starr . . . .	VI.	<i>Louisville, Ky.</i>	6 Rutland Sq.
Sullivan, Henry Howard . . .	II.	<i>Brighton</i>	98 Foster St., B.
Swasey, Albert Loring . . .	XIII.	<i>Taunton</i>	6 Louisburg Sq.
Swift, Charles Williston . .	II.	<i>Provincetown</i>	23 Worcester Sq.
Tallmadge, Thomas Eddy . .	IV.	<i>Evanston, Ill.</i>	531 Mass. Ave.
Taylor, Edward Molineux . .	II.	<i>Poughkeepsie, N. Y.</i>	194 W. Brookline St.
Taylor, Mark Elliott . . . .	II.	<i>Hyde Park</i>	Hyde Park.
Thayer, Horace Richmond . .	I.	<i>Blackstone</i>	11 St. Charles St.
Thompson, Mauricede K. Jr.	VIII.	<i>Covington, Ky.</i>	563 Mass. Ave.
Tietig, Rudolph . . . . .	IV.	<i>Cincinnati, Ohio</i>	39 St. Botolph St.
Torrey, Charles Augustine, Jr.	V.	<i>Lynnfield</i>	Lynnfield.
Treat, George Winfield . . .	I.	<i>Livermore Falls, Me.</i>	361 Columbus Ave.
Tucker, Albert William . . .	III.	<i>Newburyport</i>	Newburyport.
Tucker, Atherton Howe . . .	IV.	<i>Dorchester</i>	1079 Adams St., D.
Twombly, Fred Henry . . . .	IX.	<i>Newton Centre</i>	Newton Centre.
Ulmer, George Frederick . . .	V.	<i>Norwich, Conn.</i>	543 Mass. Ave.
Wadsworth, George Reed . . .	I.	<i>Keene, N. H.</i>	549 Mass. Ave.
Ward, Ward Wellington . . .	IV.	<i>Wyandotte, Mich.</i>	549 Mass. Ave.
Warren, John Edward . . . .	II.	<i>Foxvale</i>	Foxvale.
Waterson, Karl William . . .	VI.	<i>Lowell</i>	Lowell.
Wessel, John Frederick, A. B.	VI.	<i>Nashville, Tenn.</i>	25 Cortes St.
Wesson, Paul Bancroft . . . .	II.	<i>Tyngsboro</i>	78 Zeigler St., R.
White, William . . . . .	V.	<i>Taunton</i>	Taunton.
Whitten, Roscoe Benjamin . .	IV.	<i>E. Boston</i>	129 Brooks St., E. B.
Wilder, Clifton White . . . .	II.	<i>Leominster</i>	224 W. Canton St.
Wilder, Ralph Edward . . . .	I.	<i>Jamaica Plain</i>	3 Sunset Ave., J. P.
Wilder, William Alfonso . . .	VI.	<i>Washington, D. C.</i>	15 Cortes St.
Wing, Charles Frederic, Jr. . .	VI.	<i>New Bedford</i>	407 Mass. Ave.
Wing, David Laforest . . . .	IX.	<i>Bangor, Me.</i>	563 Mass. Ave.
Winslow, Charles-Edward A.	VII.	<i>Boston</i>	Hotel Oxford.
Wood, Winthrop Barrett . . .	I.	<i>Concord</i>	Concord.
Zimmermann, Walter Gustave	II.	<i>Chicago, Ill.</i>	1096 Boylston St.

## Second Year.

NAME.	COURSE.	HOME.	RESIDENCE.
Abbott, Lewis Benjamin	IV.	<i>Danvers</i>	Danvers.
Abeel, David Gustavus	I.	<i>Catskill, N. Y.</i>	11 Irvington St.
Adams, John Howard	IV.	<i>Parowtucket, R. I.</i>	51 Warren Ave.
Adams, Walter Owen	X.	<i>Annisquam</i>	Cambridge.
Addicks, Lawrence	II., VI.	<i>Philadelphia, Pa.</i>	146 Charles St.
Albee, Edward Everett	I.	<i>Boston</i>	160 W. Concord St.
Archibald, Warren Martin	I.	<i>Medford</i>	Medford.
Ashley, Harrison Everett	X.	<i>New Bedford</i>	Hopestill St., D.
Ayer, Harold Osgood	V.	<i>Danville, Vt.</i>	Hyde Park.
Babbitt, Albert Lyman	I.	<i>Somerville</i>	Somerville.
Babcock, Henry Kimberly	VI.	<i>Neenah, Wis.</i>	112 Newbury St.
Bailey, Robert William	XIII.	<i>New York, N. Y.</i>	37 St. Botolph St.
Bailey, Thomas Wendell	IV.	<i>Allston</i>	49 Gardner St., A.
Balkam, Clifford Mann	VII.	<i>Randolph</i>	Randolph.
Bean, Walter Raymond	XIII.	<i>Roxbury</i>	44 Woodbine St., R.
Bender, Lowry Dravo W.	III.	<i>Pittsburgh, Pa.</i>	27 Falmouth St.
Bennett, Raymond Franklin	I.	<i>Portland, Me.</i>	88 Chandler St.
Blake, Kenneth Mallon	II.	<i>Newton</i>	Newton.
Brown, Arthur Harrison	II.	<i>Reading</i>	Reading.
Brown, Carroll Wilder	I.	<i>Rye Beach, N. H.</i>	16 Concord Sq.
Brown, Charles Hoyt	X.	<i>Wellsville, N. Y.</i>	19 Concord Sq.
Burch, Guy Prentiss	I.	<i>Dubuque, Iowa</i>	73 Pinckney St.
Burgess, Philip	XI.	<i>Newtonville</i>	Newtonville.
Butler, Ferdinand Almon	VI.	<i>Salem</i>	Salem.
Caldwell, Frederick William	II.	<i>Winchester</i>	Winchester
Campbell, Charles Francis F.	II.	<i>London, Eng.</i>	So. Acton.
Campbell, Harry Andrew Bach	II.	<i>London, Eng.</i>	517 Columbus Ave.
Cannon, Sylvester Quayle	III.	<i>Salt Lake City, Utah</i>	193 W. Canton St.
Case, Herbert Monroe	VI.	<i>Hartford, Conn.</i>	1070 Boylston St.
Chandler, Edna Matilda	V.	<i>Roxbury</i>	59 Beech Glen St., R.
Clausen, Rudolph Julius	IV.	<i>Davenport, Iowa</i>	312 Columbus Ave.
Cluff, Clarence Brooks	V.	<i>Haverhill</i>	Haverhill.
Congdon, John Elliott	II.	<i>Fall River</i>	1070 Boylston St.
Copp, George Irving	II.	<i>Cambridgeport</i>	Cambridgeport.
Corbett, Charles Walter, Jr.	VI.	<i>Boston</i>	6 Rutland Sq.
Corse, William Malcolm	V.	<i>Medford</i>	Medford.
Courtis, Stuart Appleton	VI.	<i>Detroit, Mich.</i>	30 Holyoke St.
Crane, Charles Francis	I.	<i>Taunton</i>	Taunton.
Cushing, Harvey Morse	VI.	<i>Ottumwa, Iowa</i>	137 School St., R.
Damon, Harry Sumner	II.	<i>Bryantville</i>	111 Pembroke St.
Davila, Jenaro	I.	<i>Monterey, Mexico</i>	136 Chandler St.
Dozier, Henrietta Cuttino	IV.	<i>Atlanta, Ga.</i>	3 Linden St., A.
Dryer, James Cyrus	VI.	<i>Rochester, N. Y.</i>	37 St. Botolph St.
Eaton, Henry Charles	II.	<i>Waltham</i>	Waltham.

## SECOND YEAR (continued).

NAME.	COURSE.	HOME.	RESIDENCE.
Ellery, James Benjamin . . . .	V.	<i>Annisquam</i> . . . .	181 Warren Ave.
Farnum, Dwight . . . .	III.	<i>Brookline</i> . . . .	Brookline.
Ferguson, John Berton . . . .	I.	<i>Woburn</i> . . . .	Woburn.
Field, Leonard H., Jr., A.B. . . .	IV.	<i>Jackson, Mich.</i> . . . .	77 Appleton St.
Fifield, Frederic Alonzo . . . .	II.	<i>Methuen</i> . . . .	111 Pembroke St.
Flemings, John Albert . . . .	VI.	<i>Lowell</i> . . . .	Lowell.
Flynn, William Burwell . . . .	VI.	<i>Springfield</i> . . . .	30 Holyoke St.
Foote, Arthur Burling . . . .	I.	<i>Grass Valley, Cal.</i> . . . .	39 St. Botolph St.
Foulkes, Edward . . . .	IV.	<i>Portland, Oreg.</i> . . . .	343 Cambridge St.
Fowle, Frank Fuller . . . .	VI.	<i>Boston</i> . . . .	557 Columbus Ave.
Fraser, Matilda Alexandra . . . .	IV.	<i>Cleveland, Ohio</i> . . . .	293 Cambridge St., A.
Gale, Gardner Manning . . . .	IV.	<i>Olean, N. Y.</i> . . . .	376 Columbus Ave.
Garrett, Christina Hallowell . . . .	IV.	<i>Philadelphia, Pa.</i> . . . .	6 Cedar Ave., J. P.
Gaskill, Charles Sutter . . . .	II.	<i>Mt. Holly, N. J.</i> . . . .	20 St. Botolph St.
Gehring, Edwin Wagner . . . .	I.	<i>Cleveland, Ohio</i> . . . .	48 Pinckney St.
Gillson, Charles Burton . . . .	X.	<i>Evanston, Ill.</i> . . . .	298 Columbus Ave.
Gilpin, Russell . . . .	II.	<i>Wilmington, Del.</i> . . . .	19 W. Cedar St.
Glover, George Curtis . . . .	IV.	<i>Melrose Highlands</i> . . . .	Melrose Highlands.
Goldthwaite, Harry Wales . . . .	II.	<i>Brighton</i> . . . .	19 Bigelow St., B.
Greenlaw, Charles Rutherford . . . .	II.	<i>Roxbury</i> . . . .	19 Atherton St., R.
Greer, Herbert Chester . . . .	III.	<i>New Castle, Pa.</i> . . . .	28 St. James Ave.
Grover, Frederick Warren . . . .	VIII.	<i>Lynn</i> . . . .	Lynn.
Ham, Clara Eleanor . . . .	VII.	<i>No. Middleboro</i> . . . .	9 Concord Sq.
Hammond, Edward Hosmer . . . .	V.	<i>Newton Centre</i> . . . .	Newton Centre.
Hammond, Edwin Walden . . . .	I.	<i>Ashbury Park, N. J.</i> . . . .	56 Temple St.
Hapgood, Lyman Proctor . . . .	I.	<i>Athol Centre</i> . . . .	168 W. Newton St.
Harrison, Alfred William . . . .	III.	<i>Minneapolis, Minn.</i> . . . .	16 Rutland Sq.
Harwood, Charles Frank . . . .	II.	<i>Warren</i> . . . .	8 Alcott St., A.
Hasbrouck, Ross . . . .	VIII.	<i>Poughkeepsie, N. Y.</i> . . . .	37 St. Botolph St.
Hazeltine, Benj. Prescott, Jr. . . .	VI.	<i>Belfast, Me.</i> . . . .	18 St. James Ave.
Heckle, George Rogers . . . .	I.	<i>Roxbury</i> . . . .	55 Moreland St., R.
Heghinian, Garabed Geo., A.B. . . .	I.	<i>Marash, Turkey</i> . . . .	Auburndale.
Herbert, Edward . . . .	VI.	<i>Broad Run, Va.</i> . . . .	15 Claremont Park.
Herman, Bernard . . . .	I.	<i>Washington, D. C.</i> . . . .	17 Berwick Park.
Hermanns, Frank Edward . . . .	I.	<i>Denver, Colo.</i> . . . .	42 Falmouth St.
Hern, Joseph Louis . . . .	VI.	<i>Dorchester</i> . . . .	34 Sydney St., D.
Hinckley, Everett Hale . . . .	X.	<i>Hyannis</i> . . . .	41 Sterling St.
Hinman, Walter Hibbard . . . .	X.	<i>Roslindale</i> . . . .	29 Albano St., Ros.
Holliday, Alexander Riemann . . . .	I.	<i>Indianapolis, Ind.</i> . . . .	543 Mass. Ave.
Horton, Frank Nelson . . . .	XIII.	<i>Southbridge</i> . . . .	Intervale Park, D.
Hume, George Seward . . . .	VI.	<i>Eastport, Me.</i> . . . .	38 St. Botolph St.
James, Henry Philip . . . .	II., VI.	<i>Kendal Green</i> . . . .	Kendal Green.
Johnson, Harry George . . . .	V.	<i>Auburndale</i> . . . .	Auburndale.
Johnson, Lane . . . .	II.	<i>Kansas City, Mo.</i> . . . .	71 Pinckney St.
Kendall, Arthur Isaac . . . .	V.	<i>Somerville</i> . . . .	Somerville.

## SECOND YEAR (continued).

NAME.	COURSE.	HOME.	RESIDENCE.
Keys, Harry Montifix . . .	VI.	<i>Linden, Md.</i>	12 Kingsdale St., D.
Kimball, Fred Lewis Holt . .	III.	<i>Newton Lower Falls.</i>	Newton Lower Falls.
Kingman, William Alden . . .	V.	<i>So. Framingham . . .</i>	So. Framingham.
Kinsman, William Abbot . . .	II.	<i>Salem . . . . .</i>	Salem.
Lawrence, Herbert Everett . .	VI.	<i>Ayer . . . . .</i>	Ayer.
Lennan, Thomas Frank . . . .	V.	<i>Belmont . . . . .</i>	Belmont.
Lewis, Clancey Montana . . . .	III.	<i>Ketchum, Idaho . . . .</i>	198 W. Brookline St.
Lewis, Joseph Elliot . . . . .	II.	<i>Centreville . . . . .</i>	30 Norway St.
Magee, Guy, Jr. . . . .	I.	<i>Chicago, Ill. . . . .</i>	1096 Boylston St.
Magee, John 2d . . . . .	II.	<i>Wenham Depot . . . . .</i>	Wenham Depot.
McDonald, Charles Snead . . . .	IV.	<i>Louisville, Ky. . . . .</i>	Newton.
Mead, Edwin Bradley . . . . .	IV.	<i>Erie, Pa. . . . .</i>	Cambridge.
Miliken, Carl Spencer . . . . .	VII.	<i>Malden . . . . .</i>	Malden.
Moore, Clarence Alfred . . . . .	X.	<i>Arlington . . . . .</i>	Arlington.
Mork, Harry Solomon . . . . .	V.	<i>Roxbury . . . . .</i>	19 Waumbeck St., R.
Morris, William Longfellow . . .	VI.	<i>Washington, D. C. . . . .</i>	15 Claremont Park.
Morse, Benjamin Eames . . . . .	II.	<i>Canton . . . . .</i>	Canton.
Morse, Harry Leonard . . . . .	II, VI.	<i>Allston . . . . .</i>	8 Ashford St., A.
Motch, Stanley . . . . .	III.	<i>Covington, Ky. . . . .</i>	198 W. Springfield St.
Mott-Smith, Morton Churchill . .	VI.	<i>Boston . . . . .</i>	911 Boylston St.
Nathan, Albert Franklin, Jr. . . .	X.	<i>Kansas City, Mo. . . . .</i>	23 Pinckney St.
Newell, Lester Allan . . . . .	III.	<i>Southbridge . . . . .</i>	726 A Dudley St., D.
Newell, William Stark . . . . .	XIII.	<i>Winchester . . . . .</i>	Winchester.
O'Hearn, Timothy Cyril . . . . .	X.	<i>No. Cambridge . . . . .</i>	No. Cambridge.
O'Leary, William H. J., A.M. . . .	VI.	<i>Richibucto, N. B. . . . .</i>	194 W. Brookline St.
Packard, Edwin Augustus . . . . .	II.	<i>Mansfield . . . . .</i>	Mansfield.
Page, Charles Barnard . . . . .	XIII.	<i>Dorchester . . . . .</i>	259 Washington St., D.
Parker, William Edward . . . . .	I.	<i>Newtonville . . . . .</i>	Newtonville.
Patch, James Alfred . . . . .	X.	<i>Stoneham . . . . .</i>	Stoneham.
Pennock, George Alger . . . . .	II.	<i>Weston . . . . .</i>	Weston.
Perkins, George Hawthorne . . . .	II.	<i>Salem . . . . .</i>	Salem.
Phalen, William Clifton . . . . .	V.	<i>Gloucester . . . . .</i>	148 Trenton St., E. B.
Phelps, Earle Bernard . . . . .	V.	<i>New Brunswick, N. J. . . . .</i>	Somerville.
Pierce, Edward Everett . . . . .	XIII.	<i>Malden . . . . .</i>	Malden.
Pinkham, Ralph Howard . . . . .	I.	<i>Roxbury . . . . .</i>	175 Amory St., R.
Potts, Louis Joseph, A.B. . . . .	VI.	<i>Charlestown . . . . .</i>	Navy Yard, C.
Price, Willard Atherton . . . . .	I.	<i>Denver, Colo. . . . .</i>	88 Morton St., M.
Priest, George Heywood . . . . .	X.	<i>Waltham . . . . .</i>	Waltham.
Priest, Warren Albert . . . . .	V.	<i>Roxbury . . . . .</i>	100 Homestead St., R.
Proctor, Alfred Waters . . . . .	VI.	<i>Boston . . . . .</i>	219 W. Springfield St.
Real y Gaillard, Juan, A.B. . . . .	I.	<i>Santiago de Cuba . . . . .</i>	Webster Terrace, A.
Regestein, Ernest Albrecht . . . .	VI.	<i>Jamaica Plain . . . . .</i>	92 Wyman St., J. P.
Renshaw, Clarence . . . . .	VI.	<i>Baltimore, Md. . . . .</i>	83 Montgomery St.
Richardson, James Herbert . . . .	I.	<i>Newtonville . . . . .</i>	Newtonville.
Richardson, Maurice Frederic . . .	II.	<i>E. Providence, R. I. . . . .</i>	7 Concord Sq.

## SECOND YEAR (continued).

NAME.	COURSE.	HOME.	RESIDENCE.
Richmond, Gerald Martin . . .	VI.	<i>Worcester</i> . . . .	4 Marlborough St.
Rickards, Burt Ransom . . .	V.	<i>Malden</i> . . . .	Malden.
Riddle, Herbert Hugh . . .	IV.	<i>Chicago, Ill.</i> . . . .	Trinity Court.
Riddle, Lewis Wetmore . . .	XIII.	<i>Chicago, Ill.</i> . . . .	Trinity Court.
Riker, George Hayes . . .	X.	<i>Somerville</i> . . . .	Somerville.
Robertson, Samuel Brown . . .	I.	<i>E. Milton</i> . . . .	E. Milton.
Robinson, Thomas Pendleton . . .	II.	<i>Philadelphia, Pa.</i> . . . .	Chestnut Hill.
Robson, Edward Riggs . . .	I.	<i>Wellesley Hills</i> . . . .	222 Huntington Ave.
Rood, Norman Paul . . .	IV.	<i>Madisonville, Ohio</i> . . . .	134 St. Botolph St.
Samuels, Edwin Francis . . .	II.	<i>Hyde Park</i> . . . .	Hyde Park.
Sawyer, Haven . . .	II.	<i>Bangor, Me.</i> . . . .	563 Mass. Ave.
Seavey, Norman Emery . . .	VI.	<i>Dover, N. H.</i> . . . .	Park St., R.
Sherrill, Miles Standish . . .	V.	<i>Louisville, Ky.</i> . . . .	14 James St.
Sibley, Edward Warren . . .	II.	<i>Weston</i> . . . .	Weston.
Sites, Frederick Robert . . .	I.	<i>Newton</i> . . . .	Newton.
Skinner, Hervey Judson . . .	V.	<i>Wakefield</i> . . . .	Wakefield.
Smith, Charles Alfred . . .	I.	<i>Reading</i> . . . .	376 Columbus Ave.
Smith, Charles Edward . . .	I.	<i>Somerville</i> . . . .	Somerville.
Smith, Montfort Hill . . .	IV.	<i>Falmouth</i> . . . .	Glen Road, J. P.
Smithwick, Harold . . .	II.	<i>Newcastle, Me.</i> . . . .	103 Appleton St.
Soule, Horace Webster . . .	II.	<i>Somerville</i> . . . .	Somerville.
Soule, Lawrence Clement . . .	X.	<i>Newtonville</i> . . . .	Newtonville.
Starr, Herbert Harris . . .	I.	<i>New London, Conn.</i> . . . .	8 Concord Sq.
Stearns, Frederic Baldwin . . .	IV.	<i>Brookline</i> . . . .	Brookline.
Stetson, James Alexander . . .	I.	<i>New Bedford</i> . . . .	Hopestill Ave., D.
Stockton, Philip, A.B. . . .	I.	<i>Boston</i> . . . .	390 Beacon St.
Street, Gerald Basil . . .	II.	<i>Highland Park, Ill.</i> . . . .	531 Mass. Ave.
Sutermeister, Edwin . . .	V.	<i>Readville</i> . . . .	Readville.
Swan, Clifford Melville . . .	V.	<i>Brookline</i> . . . .	Brookline.
Swift, Frank Robinson . . .	X.	<i>Buffalo, N. Y.</i> . . . .	87 W. Rutland Sq.
Tappan, Frederic . . .	VI.	<i>Boston</i> . . . .	171 Newbury St.
Taylor, Denzil Hollis . . .	I.	<i>Peterboro', N. H.</i> . . . .	Cambridge.
Trask, Edgar Pierce . . .	XIII.	<i>Peabody</i> . . . .	Peabody.
Tufts, John Lawrence . . .	V.	<i>Roxbury</i> . . . .	50 Woodbine St., R.
Waddell, Fred Creelman . . .	I.	<i>Rockport</i> . . . .	14 Hamlet St., D.
Walker, Clarence Howard . . .	II.	<i>Rumford, R. I.</i> . . . .	37 Rutland Sq.
Walters, Edward Philip . . .	V.	<i>Providence, R. I.</i> . . . .	28 Leyland St., D.
Walton, James Henry, Jr. . . .	V.	<i>Newburyport</i> . . . .	466 Mass. Ave.
Watkins, Frederick Arthur . . .	II.	<i>Chicago, Ill.</i> . . . .	173 St. Botolph St.
Watrous, Charles Albert . . .	IV.	<i>Des Moines, Iowa</i> . . . .	37 St. Botolph St.
Wedlock, William Henry . . .	I.	<i>Roxbury</i> . . . .	4 Weldon St., R.
Wells, Walter Wiley . . .	VI.	<i>Sackville, N. B.</i> . . . .	Waltham.
Whitaker, Lewis Rose . . .	I.	<i>Brighton</i> . . . .	Parsons St., B.
White, Harry Keith . . .	IV.	<i>Brattleboro, Vt.</i> . . . .	51 Warren Ave.
Whitney, Walter Cummings . . .	I.	<i>Newton</i> . . . .	Newton.

SECOND YEAR (*continued*).

NAME.	COURSE.	HOME.	RESIDENCE.
Witherell, Percy Warren	VI.	Roxbury . . . . .	5 Devon St., R.
Wood, Willard Lyman, Jr.	VI.	Upton . . . . .	102 Appleton St.
Woollett, John Woodward	I.	Valmont, Colo. . . . .	196 Walnut Ave., R.

## First Year.

Adams, George Orlando		No. Andover . . . . .	No. Andover.
Albee, Herbert Harper		Wollaston . . . . .	Wollaston.
Allen, Elbert Grover		E. Bridgewater . . . . .	E. Bridgewater.
Allen, William Russell, Jr.		Pittsfield . . . . .	21 Claremont Park.
Anderson, Charles Louis Bates		Newburyport . . . . .	Newburyport.
Angus, William Jackson		Chicago, Ill. . . . .	298 Columbus Ave.
Ashley, George Francis		Somerville . . . . .	Somerville.
Atwood, Alfred James		Ayer . . . . .	Ayer.
Atwood, George Desler		No. Bennington, Vt. . . . .	21 St. Botolph St.
Ayers, Frederic Chesley		Roxbury . . . . .	11 Forest St., R.
Babcock, Paul Aldrich		E. Milton . . . . .	E. Milton.
Bacon, Charles James		Winthrop . . . . .	Winthrop.
Badlam, Stephen		Dorchester . . . . .	15 Columbia St., D.
Baker, Willis Clark		Granitzville, S. C. . . . .	356 Columbus Ave.
Balcom, Reuben Wilfred		Framingham . . . . .	Framingham.
Barney, Morgan		New Bedford . . . . .	73 Pinckney St.
Bartlett, Jane Howard		W. Bridgewater . . . . .	4380 Washington St., Ros.
Barton, Charles Augustus, Jr.		Park Ridge, Ill. . . . .	194 W. Brookline St.
Batcheller, James Hervey		Charlestown . . . . .	34 Monument Sq., C.
Beckwith, Edward Pierrepont		Cazenovia, N. Y. . . . .	Cambridge.
Belknap, George Henry		Mattapan . . . . .	13 Milton Ave., M.
Blair, Robert Sherman		Waterbury, Conn. . . . .	1126 Boylston St.
Bolster, Roy Hale		Roxbury . . . . .	10 Cobden St., R.
Borden, Raymond Davis		Fall River . . . . .	1126 Boylston St.
Breer, Louis Bennett		Lynn . . . . .	466 Mass. Ave.
Briggs, Albert Billings		Boston . . . . .	2 Pleasant St. Pl.
Briggs, Charles Calvin, Jr.		Pittsburgh, Pa. . . . .	543 Mass. Ave.
Brigham, Edmond Francis		Newton Highlands . . . . .	Newton Highlands.
Brooks, Paul Raymond		Chicago, Ill. . . . .	39 St. Botolph St.
Brown, Clarence Clapp		Reading . . . . .	Reading.
Brown, John Wesley		Newburyport . . . . .	466 Mass. Ave.
Brown, Stephen Pearson		Dover, Me. . . . .	1078 Boylston St.
Bugbee, Edward Everett		Brookline . . . . .	Brookline.
Bullard, Lewis Hinkley		Wellesley Hills . . . . .	Wellesley Hills.
Burnham, Frank Erwin		Reading . . . . .	Reading.
Burnham, Roy Gibson		Essex . . . . .	Essex.
Burns, James Dennis, Jr.		Salem . . . . .	Salem.
Burroughs, Karl		Somerville . . . . .	Somerville.

## FIRST YEAR (continued).

NAME.	HOME.	RESIDENCE.
Cahn, Edgar Bernard . . . .	Chicago, Ill. . . . .	21 St. James Ave.
Calder, Walter Douglas . . . .	Philadelphia, Pa. . . . .	24 Union Park.
Campbell, John . . . . .	Pittsburgh, Pa. . . . .	466 Mass. Ave.
Cayvan, Llewellyn Leopold . . . .	So. Boston . . . . .	660 Sixth St., S. B.
Chaffee, Walter Crane . . . . .	Detroit, Mich. . . . .	13 Concord Sq.
Chalmers, Harry Bishop . . . . .	Lonsdale, R. I. . . . .	154 W. Canton St.
Chapman, Eben Lord . . . . .	Franklin Falls, N. H. . . . .	491 Mass. Ave.
Charles, Walter Nathan . . . . .	Roxbury . . . . .	127 Eustis St., R.
Chase, Frank David . . . . .	Evanston, Ill. . . . .	99 Falmouth St.
Christensen, William Otto . . . . .	Belmont . . . . .	Belmont.
Church, Lenoir Campbell . . . . .	Brighton . . . . .	1 Menlo St., B.
Churchman, Albert Lawrence . . . . .	Wilmington, Del. . . . .	27 St. Botolph St.
Clapp, Frederick Gardner . . . . .	So. Boston . . . . .	169 Boston St., S. B.
Clapp, Harvey Rowland . . . . .	Port Deposit, Md. . . . .	15 Greenwich Park.
Clary, Robert Hodgen . . . . .	Seattle, Wash. . . . .	21 St. Botolph St.
Cleveland, Ernest Elgin . . . . .	Somerville . . . . .	Somerville.
Clow, Percival Charles . . . . .	Orange . . . . .	Brockton.
Collier, William Rawson . . . . .	Atlanta, Ga. . . . .	1078 Boylston St.
Comey, Charles Henry . . . . .	Dorchester . . . . .	3 Herbert St., D.
Conant, Franklin Norton . . . . .	Boston . . . . .	3 Wellington St.
Conant, Harold Sargent . . . . .	Gloucester . . . . .	25 Rockville Park, R.
Conant, John Bancroft . . . . .	Boston . . . . .	421 Mass. Ave.
Cooke, Frederick Hosmer . . . . .	Cincinnati, Ohio . . . . .	Newton.
Cooper, Philip Benson . . . . .	Annapolis, Md. . . . .	5 St. James Ave.
Corliss, Cyrus . . . . .	Randolph . . . . .	Randolph.
Cotting, Charles Burton . . . . .	W. Newton . . . . .	W. Newton.
Crane, Charles Spencer . . . . .	Scranton, Pa. . . . .	20 St. James Ave.
Crittenden, Samuel Hallett . . . . .	Highwood, N. J. . . . .	145 W. Newton St.
Crocker, Harry Longfellow . . . . .	Portland, Me. . . . .	19 Upton St.
Crowell, Louis Austin . . . . .	E. Dennis . . . . .	191 Warren Ave.
Cutting, George Warren, Jr. . . . .	Weston . . . . .	Weston.
Dart, Albert Charles, Jr. . . . .	Rock Island, Ill. . . . .	9 St. James Ave.
Dart, Cyrus Victor . . . . .	Rock Island, Ill. . . . .	9 St. James Ave.
Davenport, Maurice . . . . .	Brooklyn, N. Y. . . . .	Cambridge.
Davis, Wilbur Ward . . . . .	Malden . . . . .	Malden.
Dean, Walter Clark . . . . .	Dalton, Pa. . . . .	157 Warren Ave.
Delesdernier, Frederic Mortimore . . . . .	Needham . . . . .	Needham.
De Wolf, Richard Crosby . . . . .	Boston . . . . .	112 W. Concord St.
Dodge, Frank Edward . . . . .	Boston . . . . .	163 W. Canton St.
Dorey, William Asbury . . . . .	Cincinnati, Ohio . . . . .	145 W. Canton St.
Dunbar, Howard Reginald . . . . .	Canton . . . . .	Canton.
Durgin, Clara Isabel . . . . .	Belmont . . . . .	Belmont.
Durgin, Edmund Horace . . . . .	Boston . . . . .	175 Newbury St.
Dwight, William Barlow . . . . .	Evanston, Ill. . . . .	1078 Boylston St.
Eberhardt, Herman . . . . .	Portland, Oreg. . . . .	38 St. Botolph St.

## FIRST YEAR (continued).

NAME.	HOME.	RESIDENCE.
Edson, Warren Adams . . . .	<i>Dorchester</i> . . . .	11 Tremlett St., D.
Elbert, Samuel Bass . . . .	<i>Des Moines, Iowa</i> . . . .	543 Mass. Ave.
Ellis, Carleton . . . . .	<i>Keene, N. H.</i> . . . .	154 W. Canton St.
Emery, George Webster . . . .	<i>Charlestown</i> . . . .	6 Mystic St., C.
Evans, David Howard . . . .	<i>Philadelphia, Pa.</i> . . . .	20 Hancock St.
Everett, Frederic Elwin . . . .	<i>Elkins, N. H.</i> . . . .	Somerville.
Farwell, Raymond Everett . . . .	<i>Turner's Falls</i> . . . .	562 Mass. Ave.
Fischer, Adolph Louis . . . .	<i>Salem, Mo.</i> . . . .	312 Columbus Ave.
Fitch, Francis Theodore . . . .	<i>Watertown, N. Y.</i> . . . .	424 Mass. Ave.
Fitch, Stanley Gay Hyde . . . .	<i>Dorchester</i> . . . .	14 Morrill St., D.
Fitzpatrick, William Leo . . . .	<i>E. Boston</i> . . . .	269 Webster St., E. B.
Flanders, Herbert Merritt . . . .	<i>Malden</i> . . . .	Malden.
Fosdick, Charles Mussey . . . .	<i>Fitchburg</i> . . . .	21 Claremont Park.
Foster, Floyd J. . . . .	<i>Pittsburgh, Pa.</i> . . . .	21 St. Botolph St.
Foye, Frederic Elmer . . . .	<i>Brockton</i> . . . .	Brockton.
Frink, Francis Guy . . . . .	<i>Seattle, Wash.</i> . . . .	118 Dartmouth St.
Fulton, William Howard . . . .	<i>Chelmsford</i> . . . .	118 Chandler St.
Gage, Frank De Meritte . . . .	<i>Bradford</i> . . . .	119 Appleton St.
Gallagher, Edward Gerald . . . .	<i>So. Framingham</i> . . . .	So. Framingham.
Gardner, Stephen Franklin . . . .	<i>Boston</i> . . . .	401 Charles St.
Gauss, Carl Frederich . . . .	<i>Cambridge</i> . . . .	Cambridge.
Geiger, Arthur William . . . .	<i>Boston</i> . . . .	350 Beacon St.
Gibbs, George Crocker . . . .	<i>New Bedford</i> . . . .	73 Pinckney St.
Gibson, Austin Ely . . . . .	<i>Cleveland, Ohio</i> . . . .	142 Huntington Ave.
Gilson, Claude Ulmus . . . .	<i>Wellesley Hills</i> . . . .	Wellesley Hills.
Gilson, Henry Robbins . . . .	<i>Groton</i> . . . .	Groton.
Glover, Russell Henry . . . .	<i>Harrington, Me.</i> . . . .	73 Pinckney St.
Goodridge, Frederick Stanley . . . .	<i>Lynn</i> . . . .	Lynn.
Gowell, Louis Nelson . . . .	<i>Weston</i> . . . .	Weston.
Graff, Sheldon Dermitt . . . .	<i>Pittsburgh, Pa.</i> . . . .	Cambridge.
Grant, Harry Lamar . . . . .	<i>Covington, Ky.</i> . . . .	145 W. Canton St.
Greene, Bertram Wm. Batchelder . . . .	<i>Paris, France</i> . . . .	6 Louisburg Sq.
Hall, George Anthony . . . .	<i>Boston</i> . . . .	30 Exeter St.
Hall, Milton Weston . . . . .	<i>Evanston, Ill.</i> . . . .	21 St. Botolph St.
Hall, Stephen Minard . . . .	<i>Waverly, N. Y.</i> . . . .	119 Appleton St.
Hammond, Clifford Robson . . . .	<i>Buffalo, N. Y.</i> . . . .	134 St. Botolph St.
Hanson, Harry Christian . . . .	<i>Roxbury</i> . . . .	72 Munroe St., R.
Hapgood, Cyrus Howard . . . .	<i>Everett</i> . . . .	Everett.
Harps, Harry Macy . . . . .	<i>Nantucket</i> . . . .	Cambridgeport.
Hart, William Stephen . . . .	<i>Hyde Park</i> . . . .	Hyde Park.
Haselton, Barton . . . . .	<i>Rome, N. Y.</i> . . . .	134 Huntington Ave.
Hearne, William Lowder . . . .	<i>Wheeling, W. Va.</i> . . . .	Hotel Kempton.
Higgins, John Mitchell . . . .	<i>Norwich, Conn.</i> . . . .	543 Mass. Ave.
Hodsdon, Charles Wentworth . . . .	<i>Cambridgeport</i> . . . .	Cambridgeport.
Holbrook, George Myron . . . .	<i>Cambridgeport</i> . . . .	Cambridgeport.



## FIRST YEAR (continued).

NAME.	HOME.	RESIDENCE.
Hopeman, Bertram Cornelius . . . .	<i>Rochester, N. Y.</i> . . . .	19 Linden St., A.
Hopkins, Robert Milne . . . .	<i>Allston</i> . . . .	610 Cambridge St., A.
Hopwood, Cora Stella . . . .	<i>Worcester</i> . . . .	Worcester.
Howe, Herbert Holmes . . . .	<i>Roxbury</i> . . . .	13 Townsend St., R.
Hubbard, William Henry . . . .	<i>Charleston, S. C.</i> . . . .	Cambridge.
Hughes, Charles Haynes . . . .	<i>Boston</i> . . . .	5 Concord Sq.
Hunt, Harry Leigh . . . .	<i>Willimantic, Conn.</i> . . . .	19 Union Park.
Hunt, Herman Reynolds . . . .	<i>New Bedford</i> . . . .	574 Mass. Ave.
Hurd, William Reynobson . . . .	<i>Dorchester</i> . . . .	8 Butler St., D.
Hussey, James Whittlesey . . . .	<i>Toledo, Ohio</i> . . . .	134 Chandler St.
Ingalls, Frederick Du Bois . . . .	<i>Kingston, N. Y.</i> . . . .	Somerville.
Jackson, Willard Franklin . . . .	<i>Campello</i> . . . .	Campello.
Jenkins, Lawrence Waters, A.B. . . .	<i>Boston</i> . . . .	125 St. Botolph St.
Jennings, Levi Brown . . . .	<i>Weston</i> . . . .	Weston.
Jennings, Walter Upham . . . .	<i>Newton Lower Falls</i> . . . .	Weston.
Johnson, Carl Francis . . . .	<i>Milwaukee, Wis.</i> . . . .	67 Westland Ave.
Johnson, Charles Chaplin . . . .	<i>Danversport</i> . . . .	Danversport.
Jouett, Henry Detrick . . . .	<i>Somerville</i> . . . .	Somerville.
Kattelle, Walter Roby . . . .	<i>Auburndale</i> . . . .	Auburndale.
Keith, Leigh Shelton . . . .	<i>No. Easton</i> . . . .	No. Easton.
Knight, George Washington . . . .	<i>Dorchester</i> . . . .	38 Rosseter St., D.
Larcombe, John Southey, Jr. . . .	<i>Washington, D. C.</i> . . . .	23 St. James Ave.
Lawley, Frederick Damon . . . .	<i>So. Boston</i> . . . .	47 M St., S. B.
Lawrence, Lewis Morse . . . .	<i>Dorchester</i> . . . .	9 Grant St., D.
Leach, George Henry . . . .	<i>Campello</i> . . . .	Campello.
Leach, Robert Howland . . . .	<i>Brockton</i> . . . .	Brockton.
Leary, Charles Arthur . . . .	<i>Waltham</i> . . . .	Waltham.
Leatherbee, Albert Thompson . . . .	<i>Boston</i> . . . .	85 Westland Ave.
Leeds, Charles Tileston . . . .	<i>Newton</i> . . . .	Newton.
Leonard, Clifford Milton . . . .	<i>Chicago, Ill.</i> . . . .	20 St. Germain St.
Lewis, Rondel . . . .	<i>Malden</i> . . . .	Malden.
Lindsley, Frederick Cleland . . . .	<i>Washington, D. C.</i> . . . .	Auburndale.
Lingley, Robert Ross . . . .	<i>Cambridge</i> . . . .	Cambridge.
Litchman, Harold Bartlett . . . .	<i>Marblehead</i> . . . .	Marblehead.
Littlefield, Homer . . . .	<i>W. Troy, N. Y.</i> . . . .	Cambridgeport.
Lohbillier, Harry John . . . .	<i>Jamaica Plain</i> . . . .	21 Cranston St., J. P.
Long, John William . . . .	<i>Charlestown</i> . . . .	71 Moulton St., C.
Lumbert, Rutherford Vipond . . . .	<i>Newton Lower Falls</i> . . . .	Newton Lower Falls.
Luyties, Otto Gerhard . . . .	<i>New York, N. Y.</i> . . . .	130 W. Newton St.
MacKeen, Isaac Abner . . . .	<i>Peabody</i> . . . .	Peabody.
MacKoon, Frederic Hall . . . .	<i>Auburn, N. Y.</i> . . . .	546 Mass. Ave.
Mague, Francis Joseph . . . .	<i>W. Newton</i> . . . .	W. Newton.
Maguire, Joseph Travers . . . .	<i>Dorchester</i> . . . .	8 Beale St., D.
Manley, Sumner Marshall . . . .	<i>Brockton</i> . . . .	Brockton.
Maxfield, Daniel Ellwood . . . .	<i>Amesbury</i> . . . .	634 Warren St., R.

## FIRST YEAR (continued).

NAME.	HOME.	RESIDENCE.
Mayhew, Harold Baker . . . .	<i>W. Tisbury</i> . . . .	86 Chandler St.
McCrudden, Francis Henry . . . .	<i>Boston</i> . . . .	134 Castle St.
McDonald, James George . . . .	<i>Roxbury</i> . . . .	4 Highland Park, R.
McGowan, Francis Xavier . . . .	<i>Lawrence</i> . . . .	Lawrence.
McIntosh, James William . . . .	<i>Jamaica Plain</i> . . . .	66 Sheridan St., J. P.
McMaster, Herbert Milton . . . .	<i>Portland, Oreg.</i> . . . .	652 Tremont St.
McPherson, Herbert Austin . . . .	<i>Medford</i> . . . .	Medford.
Melcher, Arthur Clarke . . . .	<i>Newton Centre</i> . . . .	Newton Centre.
Merriam, Charles Allen . . . .	<i>Charleston, S. C.</i> . . . .	167 Warren Ave.
Merrick, Frederic Ickes . . . .	<i>New Brighton, Pa.</i> . . . .	543 Mass. Ave.
Merrill, Albert Sidney . . . .	<i>Malden</i> . . . .	Malden.
Miller, Lewis Arthur . . . .	<i>No. Easton</i> . . . .	No. Easton.
Miller, Stuart Berwick . . . .	<i>Cambridge</i> . . . .	Cambridge.
Minary, Thomas Helm . . . .	<i>Louisville, Ky.</i> . . . .	215 W. Canton St.
Möller, Albert Voltaire . . . .	<i>Galveston, Tex.</i> . . . .	553 Mass. Ave.
Moody, George Barrell . . . .	<i>Bangor, Me.</i> . . . .	41 St. Botolph St.
Morgan, Harold Loomis . . . .	<i>Springfield</i> . . . .	165 W. Canton St.
Morris, Henry Curtis . . . .	<i>Evanston, Ill.</i> . . . .	99 Falmouth St.
Morton, Charles Edward . . . .	<i>Webster</i> . . . .	127 St. Botolph St.
Moulton, Walter Augustus . . . .	<i>Dorchester</i> . . . .	16 Beach St., D.
Neall, Newitt Jackson . . . .	<i>Altoona, Pa.</i> . . . .	1 Oxford Terrace.
Nesmith, Thomas, Jr. . . . .	<i>Lowell</i> . . . .	175 Mass. Ave.
North, Edward . . . .	<i>Brookline</i> . . . .	Brookline.
Norton, Clifford . . . .	<i>Everett</i> . . . .	Everett.
Ober, Paul Joseph . . . .	<i>Boston</i> . . . .	748 Tremont St.
Oppenheim, Robert Emmet . . . .	<i>New York, N. Y.</i> . . . .	38 St. Botolph St.
Osgood, Harry Edmund . . . .	<i>Chicago, Ill.</i> . . . .	Somerville.
Osgood, Isaac . . . .	<i>No. Andover</i> . . . .	W. Newton.
Oxnard, Horace Whitcomb . . . .	<i>Norway, Me.</i> . . . .	335 Shawmut Ave.
Paget, John Wallace . . . .	<i>Dorchester</i> . . . .	11 Beale St., D.
Paul, Charles Edward . . . .	<i>Belfast, Me.</i> . . . .	149 W. Canton St.
Peck, Arthur Stearns . . . .	<i>Wellington</i> . . . .	Wellington.
Penard, Thomas Edward . . . .	<i>Paramaribo, D. G.</i> . . . .	135 E. Cottage St., D.
Perkins, John McClary, Jr. . . . .	<i>Arlington Heights</i> . . . .	Arlington Heights.
Pigeon, William Gardner . . . .	<i>E. Boston</i> . . . .	139 Trenton St., E. B.
Pigman, George Wood, Jr. . . . .	<i>Washington, D. C.</i> . . . .	31 Sumner St., D.
Pitcher, Edmund Henry . . . .	<i>Keene, N. H.</i> . . . .	Somerville.
Plumb, Ralph . . . .	<i>Buffalo, N. Y.</i> . . . .	85 Pinckney St.
Plummer, Howard Clark . . . .	<i>Milton</i> . . . .	Milton.
Porter, John Lewis . . . .	<i>No. Adams</i> . . . .	44 Union Park.
Potter, Myron Prescott . . . .	<i>Salem</i> . . . .	Salem.
Priest, Russell Parker . . . .	<i>Malden</i> . . . .	Malden.
Rabbeth, Walter Esmond . . . .	<i>Roxbury</i> . . . .	67 Crawford St., R.
Rand, Nathaniel Dwight . . . .	<i>Watertown</i> . . . .	Watertown.
Rapp, Walter Louis . . . .	<i>Cincinnati, Ohio</i> . . . .	Arlington.

## FIRST YEAR (continued).

NAME.	HOME.	RESIDENCE.
Reardon, Thomas Fred. Eugene	<i>Wellesley</i>	Wellesley.
Redman, Arville	<i>Belfast, Me.</i>	149 W. Canton St.
Reimer, Arthur Adams	<i>E. Orange, N. J.</i>	466 Mass. Ave.
Remington, Wolcott	<i>Windsor, Conn.</i>	Weymouth Heights.
Richardson, Chester Augustus	<i>Pelham, N. H.</i>	14 Dewey St., R.
Richardson, Clinton Leroy	<i>Winchester</i>	Winchester.
Roberts, Robert Parker	<i>Roxbury</i>	42 Quincy St., R.
Ross, Sidney Fuller	<i>Kennebunk, Me.</i>	356 Columbus Ave.
Rossmassler, Richard Carl	<i>Philadelphia, Pa.</i>	Newton.
Russell, George Edmond	<i>Woburn</i>	Woburn.
Sanders, Warren Willard	<i>W. Gardner</i>	199 W. Newton St.
Saunders, William Colegrove	<i>Jamaica Plain</i>	67 Peter Parley St., J.P.
Schlegelmilch, Leo William, Jr.	<i>Roxbury</i>	32 Mt. Pleasant Ave., R.
Schmidt, Albert George Anton	<i>Chicago, Ill.</i>	Cambridgeport.
Schneller, George Otto	<i>Ansonia, Conn.</i>	543 Mass. Ave.
Scott, Ben Embry	<i>Little Rock, Ark.</i>	82 Chandler St.
Scott, Walter	<i>Lawrence</i>	54 Montgomery St.
Searle, Lewen Firth	<i>Lawrence</i>	54 Montgomery St.
Sears, Stanley Collamore	<i>Winthrop</i>	Winthrop.
Seaver, Kenneth	<i>Woodstock, Vt.</i>	466 Mass. Ave.
Shapley, Harry Tilton	<i>Leominster</i>	224 W. Canton St.
Shaw, Brackley Azel	<i>Brighton</i>	Englewood Ave., B.
Sherman, Charles Edwin	<i>Westerly, R. I.</i>	466 Mass. Ave.
Silverman, Mortimer	<i>Allegheny, Pa.</i>	19 Berwick Park.
Smith, Sumner Ives	<i>Elkhart, Ind.</i>	172 W. Brookline St.
Southworth, Frederic Willard	<i>W. Stoughton</i>	W. Stoughton.
Sperry, Marcy Leavenworth	<i>New York, N. Y.</i>	21 W. Cedar St.
Sprague, James Paddock	<i>Kansas City, Mo.</i>	13 Concord Sq.
Stearns, Herbert Richardson	<i>Dorchester</i>	108 Cushing Ave., D.
Steidemann, Theodore William	<i>St. Louis, Mo.</i>	14 Bond St.
Stevens, Ralph	<i>Whitman</i>	Whitman.
Stevens, William Leonard	<i>Somerville</i>	Somerville.
Stewart, Lewis	<i>Trenton, N. J.</i>	99 Pinckney St.
Stone, Willard Wilberforce	<i>Taunton</i>	Taunton.
Stratton, Charles Heywood	<i>Gardner</i>	199 W. Newton St.
Strout, Robert Wheelock	<i>Salem</i>	Salem.
Suhr, Carl Frederick	<i>Chelsea</i>	Chelsea.
Suter, Russell	<i>St. Louis, Mo.</i>	Cambridge.
Swinson, Johannah Charlotte	<i>Wellesley</i>	Wellesley.
Thanisch, Otto Conrad	<i>Jamaica Plain</i>	3305 Washington St., J.P.
Thayer, Harry Martin	<i>Brockton</i>	Brockton.
Thurber, Clinton Draper	<i>Boston</i>	592 Tremont St.
Tiffany, George Stanton	<i>Washington, D. C.</i>	21 W. Cedar St.
Tower, Walter Russell	<i>Auburndale</i>	Auburndale.
Tubbs, Henry Welles	<i>Kingston, Pa.</i>	543 Mass. Ave.

## FIRST YEAR (continued).

NAME.	HOME.	RESIDENCE.
Tuck, Theodore Calvin . . . .	<i>Haverhill</i> . . . .	Haverhill.
Tucker, Fred Irving . . . .	<i>Boston</i> . . . .	222 Mass. Ave.
Tudbury, Warren Chamberlain .	<i>Salem</i> . . . .	Salem.
Tweedy, George Augustus . . .	<i>Los Angeles, Cal.</i> . .	119 Appleton St.
Ulke, Darwin . . . . .	<i>Washington, D. C.</i> . .	314 Columbus Ave.
Vogel, Emil Frederick . . . .	<i>Roxbury</i> . . . .	40 Hartwell St., R.
Warren, Frank Dinsmore . . .	<i>Northboro</i> . . . .	22 Pleasant St.
Wastcoat, Richard . . . . .	<i>Taunton</i> . . . .	Taunton.
Weeden, Walter Leslie . . . .	<i>New Bedford</i> . . . .	Wollaston.
Weeks, Irving Chambers . . . .	<i>Roxbury</i> . . . .	7 Hoiborn St., R.
Welbourn, Edward Hambleton .	<i>Baltimore, Md.</i> . . . .	43 Quincy St., R.
Wentworth, John Frank . . . .	<i>Rochester, N. H.</i> . . .	315 Columbus Ave.
Wesson, Leonard . . . . .	<i>Roxbury</i> . . . .	21 Rockville Park, R.
White, Arthur Burr . . . . .	<i>W. Newton</i> . . . .	W. Newton.
Whitman, Nathan Davis . . . .	<i>So. Boston</i> . . . .	455 Broadway, S. B.
Wickes, Lewis Webster . . . .	<i>Helena, Mont.</i> . . . .	377 Columbus Ave.
Willey, Raymond . . . . .	<i>Newtonville</i> . . . .	Newtonville.
Wilson, Alice Virginia . . . .	<i>Lenoir, N. C.</i> . . . .	101 Pinckney St.
Wise, Howard Parker . . . . .	<i>Malden</i> . . . .	Malden.
Witherell, Frederick Whitefield	<i>Winchester</i> . . . .	Winchester.
Woodward, Allan Harvey . . .	<i>Birmingham, Ala.</i> . .	34 W. Cedar St.
Worden, Edwin Sheldon . . . .	<i>Newton</i> . . . .	Newton.
Ziegler, Percy Rolfe . . . . .	<i>Roxbury</i> . . . .	1 Ellis 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.	Hist. . . . .	History.
Arch. . . . .	Architecture.	Lang. . . . .	Modern Languages.
Biol. . . . .	Biology.	Math. . . . .	Mathematics.
Chem. . . . .	Chemistry.	Mech. Eng. . . . .	Mechanical Engineering.
Civ. Eng. . . . .	Civil Engineering.	Min. Eng. . . . .	Mining Engineering.
Draw. . . . .	Drawing and Descriptive Geometry.	Nav. Arch. . . . .	Naval Architecture.
Elect. Eng. . . . .	Electrical Engineering.	Phys. . . . .	Physics.
Eng. . . . .	English.	Pol. Sci. . . . .	Political Science.
Geol. . . . .	Geology.	San. Eng. . . . .	Sanitary Engineering.
		Shop. . . . .	Shopwork.

NAME.	HOME.	RESIDENCE.
Adams, Burton Alden . . . . .	<i>Essex</i> . . . . .	Essex.
Draw., Eng., Hist., Lang., Math., Shop.		
Albin, Henry Allison . . . . .	<i>Concord, N. H.</i> . . . . .	37 Falmouth St.
Chem., Draw., Lang.		
Allen, James Walter . . . . .	<i>Newtonville</i> . . . . .	Newtonville.
Chem., Draw., Eng., Hist., Lang., Math., Phys., Shop.		
Allen, Lucy Mabel . . . . .	<i>Lynn</i> . . . . .	Lynn.
Chem.		
Allyne, Samuel Hinckley . . . . .	<i>So. Framingham</i> . . . . .	So. Framingham.
App. Mech., Civ. Eng., Geol., Lang., Phys., Pol. Sci.		
Ames, Joseph William . . . . .	<i>Melrose</i> . . . . .	Melrose.
Mech. Eng., Phys., Shop.		
Anderson, Robert Peter . . . . .	<i>Danbury, Conn.</i> . . . . .	27 Falmouth St.
Civ. Eng., Draw., Eng., Hist., Lang., Math., Phys.		
Andrews, George Frederick, A.M. . . . .	<i>Providence, R. I.</i> . . . . .	Providence, R. I.
Chem.		
Anthony, George Rutherford . . . . .	<i>Waltham</i> . . . . .	Waltham.
App. Mech., Math., Mech. Eng., Phys., Pol. Sci., Shop.		
Baker, Philip Stone . . . . .	<i>San Francisco, Cal.</i> . . . . .	8 Arlington St.
Math., Mech. Eng., Phys., Pol. Sci.		
Ballantyne, Bertha Lennie . . . . .	<i>Hudson</i> . . . . .	20 Ashburton Pl.
Chem., Draw., Eng., Lang., Math.		
Bancroft, Joseph . . . . .	<i>Wilmington, Del.</i> . . . . .	4 Oxford Terrace.
App. Mech., Chem., Lang., Math., Mech. Eng., Phys., Pol. Sci., Shop.		
Barlow, William Harvey . . . . .	<i>Mahanoy City, Pa.</i> . . . . .	21 St. Botolph St.
Chem., Phys.		
Barron, Carlyle Norris . . . . .	<i>New York, N. Y.</i> . . . . .	19 St. Botolph St.
Chem., Eng., Hist., Lang., Math., Shop.		

NAME.	HOME.	RESIDENCE.
Barry, Charles Gardner . . . .	<i>Melrose</i> . . . .	Melrose.
Draw., Eng., Hist., Lang., Math., Shop.		
Bartholomew, Arthur William . .	<i>Newton Centre</i> . . . .	Newton Centre.
Draw., Shop.		
Baumann, Edgar Butler . . . .	<i>Chicago, Ill.</i> . . . .	103 Warren Ave.
Arch., Draw.		
Beekman, John Vanderveer, Jr. .	<i>Plainfield, N. J.</i> . . . .	Cambridge.
Chem., Draw., Eng., Lang., Math.		
Blake, Francis Minot . . . .	<i>Boston</i> . . . .	426 Marlborough St.
Eng., Hist., Lang., Math., Mech. Eng., Phys., Pol. Sci., Shop.		
Bliss, Edwin Packard . . . .	<i>Newburyport</i> . . . .	27 Telegraph St., S. B.
App. Mech., Civ. Eng.		
Boland, Mary A. . . . .	<i>Boston</i> . . . .	117 W. Newton St.
Biol., Lang.		
Bonns, Walter Werdenfeld . . . .	<i>Milwaukee, Wis.</i> . . . .	127 Pembroke St.
Arch., Draw., Eng., Math., Phys.		
Bonnycastle, William Robinson .	<i>Louisville, Ky.</i> . . . .	22 Berwick Park.
App. Mech., Draw., Elect. Eng., Lang., Math., Phys.		
Bradley, William Dewey . . . .	<i>Tacoma, Wash.</i> . . . .	20 St. Germain St.
Arch., Draw.		
Brennemann, John Bartley . . . .	<i>Bethany, W. Va.</i> . . . .	658 Tremont St.
Biol., Chem.		
Brewer, Arthur Francis . . . .	<i>Fayetteville</i> . . . .	Fayetteville.
Elect. Eng., Eng., Hist., Lang., Math., Mech. Eng., Phys.		
Brickley, William Joseph . . . .	<i>Charlestown</i> . . . .	68 Tremont St., C.
Chem., Draw., Eng., Hist., Lang., Math.		
Brigham, Theodore William . . .	<i>New York, N. Y.</i> . . . .	Watertown.
Chem., Draw., Eng., Math.		
Brown, Cardella Drake . . . .	<i>Hartford, Conn.</i> . . . .	220 W. Springfield St.
Draw., Elect. Eng., Eng., Hist., Math., Mech. Eng., Phys.		
Brown, Dickson Queen, A.B. . . .	<i>New York, N. Y.</i> . . . .	1096 Boylston St.
App. Mech., Draw., Elect. Eng., Lang., Math., Mech. Eng., Phys.		
Brown, George Winslow . . . .	<i>Boston</i> . . . .	839 Boylston St.
Chem., Eng., Hist., Lang., Math., Phys.		
Brown, John . . . . .	<i>Fall River</i> . . . .	603 Tremont St.
Chem., Draw., Math.		
Buck, Hattie Josephine . . . .	<i>Woburn</i> . . . .	Woburn.
Biol., Geol., Math.		
Bucklin, Milton Pollard . . . .	<i>Providence, R. I.</i> . . . .	36 Dartmouth St.
Draw., Eng., Lang., Math.		
Buffum, Frederick Delano . . . .	<i>Winchester, N. H.</i> . . . .	15 St. Germain St.
Draw., Eng., Hist., Math., Mech. Eng., Phys., Shop.		
Burr, Alice Morville . . . . .	<i>Melrose</i> . . . .	Melrose.
Biol.		
Burr, Helen Louise, B.A. . . . .	<i>Melrose</i> . . . .	Melrose.
Biol.		
Burrill, Nathan Carter . . . .	<i>Newburyport</i> . . . .	1 Yarmouth St.
App. Mech., Civ. Eng.		
Butler, Walter Harold . . . .	<i>Akron, Ohio</i> . . . .	11 Batavia St.
Draw., Eng., Hist., Lang., Math., Shop.		

NAME	HOME.	RESIDENCE.
Butterworth, Elwell Robert . . .	<i>Somerville</i> . . . .	Somerville.
App. Mech., Lang., Math., Mech. Eng., Phys., Shop.		
Campbell, Percy Alfonso . . . .	<i>Derry, N. H.</i> . . . .	60 W. Newton St.
Chem., Lang., Math., Mech. Eng., Phys., Pol. Sci., Shop.		
Cannon, Willard Telle . . . .	<i>Salt Lake City, Utah</i> . . . .	193 W. Canton St.
Draw., Eng., Hist., Lang., Math., Mech. Eng., Phys., Shop.		
Capen, Carroll Adams . . . .	<i>Randolph</i> . . . .	Randolph.
App. Mech., Chem., Mech. Eng., Pol. Sci., Shop.		
Carr, Joseph Lewis . . . .	<i>Chelsea</i> . . . .	Chelsea.
Civ. Eng., Draw., Lang., Phys., Pol. Sci.		
Carter, Allie Devere . . . .	<i>Tacoma, Wash.</i> . . . .	231 W. Newton St.
Chem., Draw., Eng., Lang., Math.		
Cassidy, David Demorest, Jr. . . .	<i>Boston</i> . . . .	24 Cumberland St.
Arch., Draw.		
Chamberlain, Grace . . . .	<i>Bangor, Me.</i> . . . .	33 St. James Ave.
Eng.		
Chapman, James Finlay, B.S. . . .	<i>Mankato, Minn.</i> . . . .	Brookline.
App. Mech., Draw., Elect. Eng., Lang., Math., Mech. Eng., Phys., Shop.		
Chapman, Mary Bugbee . . . .	<i>Bangor, Me.</i> . . . .	19 Blagden St.
Eng.		
Chase, Aurin Moody, B.S. . . .	<i>Syracuse, N. Y.</i> . . . .	4 Marlborough St.
App. Mech., Draw., Mech. Eng., Phys., Shop.		
Chase, Wendell Wyse, B.C.E. . . .	<i>Foxcroft, Me.</i> . . . .	250 Warren St., R.
App. Mech., Arch., Civ. Eng., Draw., Mech. Eng.		
Clapp, Mabel Delano . . . .	<i>Boston</i> . . . .	Hotel Vendome.
Biol.		
Cobb, Herbert Luther . . . .	<i>Mansfield</i> . . . .	Mansfield.
Elect. Eng., Math., Mech. Eng., Phys., Pol. Sci., Shop.		
Collins, Howard Browning . . . .	<i>Denver, Colo.</i> . . . .	21 Claremont Park.
App. Mech., Chem., Geol., Hist., Min. Eng., Phys.		
Constantine, Arthur McGregor . . . .	<i>Newburyport</i> . . . .	Newburyport.
Chem., Eng., Lang., Math.		
Cornell, Senora Catherine . . . .	<i>Lincoln, Neb.</i> . . . .	Kingston, N. H.
Chem.		
Cornwell, William Eames . . . .	<i>Rome, N. Y.</i> . . . .	Maple St. R.
Chem., Draw., Eng., Lang., Math.		
Corson, William Bertrand . . . .	<i>Watertown</i> . . . .	Watertown.
App. Mech., Math., Mech. Eng., Phys., Shop.		
Cotter, William Edward . . . .	<i>Somerville</i> . . . .	Somerville.
App. Mech., Arch., Draw., Hist., Pol. Sci.		
Cox, Allen Howard . . . .	<i>Holyoke</i> . . . .	190 W. Canton St.
Arch., Draw.		
Craven, George Warren . . . .	<i>Bozeman, Mont.</i> . . . .	27 Gray St.
App. Mech., Elect. Eng., Math., Mech. Eng., Phys.		
Curtis, Harry Appleton, A.B. . . .	<i>Boston</i> . . . .	28 Mt. Vernon St.
Arch., Draw.		
Cushman, Frank, Jr. . . . .	<i>E. Boston</i> . . . .	17 White St., E. B.
Draw., Shop.		
Cutler, Jane Ruth, A.B. . . . .	<i>Somerville</i> . . . .	Somerville.
Chem.		

NAME.	HOME.	RESIDENCE.
Daggett, Eleanor Williams . . . Biol.	<i>Boston</i> . . . . .	116 Commonwealth Ave.
Daniels, Nathan Hagar, Jr., S.B. Mech. Eng., Shop.	<i>Boston</i> . . . . .	13 Joy St.
Darlington, William, M. E. . . . Chem., Min. Eng.	<i>Butte, Mont.</i> . . . . .	142 Chandler St.
Davis, Charles Joshua . . . . . Chem., Draw., Eng., Math.	<i>No. Chelmsford</i> . . . . .	157 W. Canton St.
Dawes, Fred Bradley . . . . . Draw., Lang., Math., Mech. Eng., Phys., Pol. Sci.	<i>Hudson</i> . . . . .	234 W. Canton St.
Day, Mary Harriett . . . . . Biol.	<i>E. Derry, N. H.</i> . . . . .	Quincy.
De Golyer, Robert Seeley . . . . App. Mech., Arch., Draw., Geol., Pol. Sci.	<i>Evanston, Ill.</i> . . . . .	531 Mass. Ave.
Delano, Maurice Francis . . . . . Civ. Eng., Draw., Geol., Lang., Math., Phys., Pol. Sci.	<i>Somerville</i> . . . . .	Somerville.
Delano, Paul Holmes . . . . . Lang., Math., Mech. Eng., Phys., Pol. Sci., Shop.	<i>Kingston</i> . . . . .	109 Marlborough St.
De Wolf, Arthur Simon . . . . . App. Mech., Mech. Eng., Shop.	<i>Melrose Highlands</i> . . . . .	Melrose Highlands.
Dexter, Katharine Moore . . . . . Biol., Chem.	<i>Boston</i> . . . . .	2 Raleigh St.
Dimock, Elwin Hibbert . . . . . Chem., Draw., Eng., Lang., Math.	<i>Dorchester</i> . . . . .	697 Washington St., D.
Dixon, Charles Sumner . . . . . App. Mech., Elect. Eng., Lang., Math., Mech. Eng., Phys., Pol. Sci.	<i>Washington, D. C.</i> . . . . .	32 Lawrence St.
Dodge, Winthrop Rufus . . . . . Chem., Lang., Math., Phys., Pol. Sci.	<i>Newburyport</i> . . . . .	42 Falmouth St.
Dolbear, Katherine Ella . . . . . Geol.	<i>Tufts College</i> . . . . .	Tufts College.
Donnell, Harry Deane . . . . . Chem., Lang., Pol. Sci.	<i>Denver, Colo.</i> . . . . .	1 Menlo St., B.
Donovan, John Augustine . . . . . Biol., Eng., Geol., Hist., Phys., Pol. Sci.	<i>Lowell</i> . . . . .	16 St. James Ave.
Drake, Charles Sumner . . . . . Chem., Civ. Eng., Draw., Eng., Hist., Lang., Math.	<i>Chicago, Ill.</i> . . . . .	38 St. Botolph St.
Drake, Chester Francis . . . . . App. Mech., Chem., Civ. Eng., Geol., Mech. Eng., Phys.	<i>W. Medford</i> . . . . .	W. Medford.
Drew, Albert Thompson . . . . . App. Mech., Chem., Lang., Mech. Eng., Phys., Shop.	<i>Newburyport</i> . . . . .	1 Yarmouth St.
Duff, Ellen Loretto . . . . . Biol.	<i>Charlestown</i> . . . . .	14 Sheafe St., C.
Ellis, David Alfred . . . . . Chem., Lang.	<i>Norwood</i> . . . . .	Norwood.
Emery, Earle Caldwell . . . . . App. Mech., Draw., Lang., Math., Mech. Eng., Phys.	<i>Bradford, Pa.</i> . . . . .	38 St. Botolph St.
Emery, Lewis, 3d . . . . . Chem., Civ. Eng., Eng., Hist., Lang., Math., Phys.	<i>Bradford, Pa.</i> . . . . .	38 St. Botolph St.
Everett, Julian Franklin . . . . . Arch., Draw., Eng., Lang., Math., Pol. Sci.	<i>Madison, Wis.</i> . . . . .	18 Huntington Ave.



NAME.	HOME.	RESIDENCE.
Ewing, Charles . . . . .	<i>Washington, D. C.</i>	89 Charles St.
Arch., Draw., Hist.		
Faught, Ray Clinton . . . . .	<i>Sidney, Me.</i>	11 Mansfield St., A.
App. Mech., Elect. Eng., Lang., Math., Mech. Eng., Phys., Pol. Sci.		
Fenner, David Colton, Ph.B. . . . .	<i>Providence, R. I.</i>	86 Huntington Ave.
App. Mech., Mech. Eng., Phys., Shop.		
Ferguson, Robert Arthur . . . . .	<i>So. Boston</i>	489 Broadway, S. B.
Chem., Draw., Eng., Hist., Lang., Math., Shop.		
Field, Frederick Cromwell . . . . .	<i>Brooklyn, N. Y.</i>	531 Mass. Ave.
Elect. Eng., Lang., Math., Mech. Eng., Phys.		
Fifield, Ethel Frances, A.B. . . . .	<i>Salem</i>	Salem.
Arch., Draw.		
Fleet, John Wallis . . . . .	<i>Fall River</i>	Somerville.
App. Mech., Civ. Eng., Geol., Lang., Phys., Pol. Sci.		
Fleming, Charles Edwin . . . . .	<i>Spartanburg, S. C.</i>	141 Pembroke St.
Lang., Math., Mech. Eng., Phys., Pol. Sci., Shop.		
Fogerty, Emory Hartwell . . . . .	<i>Worcester</i>	57 Clarendon St.
App. Mech., Mech. Eng., Pol. Sci., Shop.		
Fogg, Frank Batchelder . . . . .	<i>Hampton Falls, N. H.</i>	466 Mass. Ave.
Draw., Math., Shop.		
Fox, William Henry . . . . .	<i>Lowell</i>	1096 Boylston St.
App. Mech., Arch., Draw., Hist.		
Frame, James Thomas . . . . .	<i>Hyde Park</i>	Hyde Park.
Chem., Draw., Eng., Lang., Math., Shop.		
Frazer, Robert, Jr. . . . .	<i>Philadelphia, Pa.</i>	6 Louisburg Sq.
Arch., Chem., Draw., Eng., Hist., Lang., Math.		
Frazier, Charles Wellington . . . . .	<i>Lynn</i>	Lynn.
Elect. Eng., Math., Mech. Eng., Phys.		
French, Abram . . . . .	<i>Dedham</i>	Dedham.
App. Mech., Chem., Civ. Eng., Draw., Geol., Pol. Sci.		
Frink, Gerald . . . . .	<i>Seattle, Wash.</i>	118 Dartmouth St.
Chem., Draw., Eng., Lang., Math.		
Frothingham, Brooks, A.B. . . . .	<i>Boston</i>	339 Marlborough St.
Arch., Draw.		
Fulfer, George Arthur . . . . .	<i>Springfield</i>	531 Mass. Ave.
App. Mech., Elect. Eng., Phys., Shop.		
Fyfe, James L. . . . .	<i>Oak Park, Ill.</i>	670 Mass. Ave.
Arch., Civ. Eng., Eng., Hist., Lang., Pol. Sci.		
Gage, Du Relle . . . . .	<i>New York, N. Y.</i>	Hotel Nottingham.
Chem., Draw., Eng., Lang., Math.		
Gardner, Lester Durand . . . . .	<i>Boston</i>	17 Marlborough St.
Biol., Eng., Geol., Hist., Lang., Math., Phys., Pol. Sci.		
Gerber, Elmer Louis . . . . .	<i>Dayton, O.</i>	658 Tremont St.
Arch., Draw.		
Gifford, Richard Tracy . . . . .	<i>Fitchburg</i>	4 Oxford Terrace.
Chem., Draw., Eng., Lang., Math., Shop.		
Gill, James Seel . . . . .	<i>Ludlow, Vt.</i>	38 St. Botolph St.
Draw., Eng., Hist., Lang., Math., Mech. Eng., Phys., Shop.		
Gilman, Walter Eastman . . . . .	<i>Marshalltown, Iowa</i>	38 St. Botolph St.
Chem., Draw., Eng., Hist., Lang., Math.		

NAME.	HOME.	RESIDENCE.
Gladding, John Thomas Fiske . . . . .	<i>Providence, R. I.</i> . . . . .	19 Claremont Park. Chem., Lang., Math., Mech. Eng., Phys., Pol. Sci., Shop.
Gleason, George Hathaway . . . . .	<i>Dorchester</i> . . . . .	54 Bowdoin St., D. Chem., Draw., Eng., Lang., Math., Mech. Eng., Shop.
Godfrey, Lucius William, Jr. . . . .	<i>Buffalo, N. Y.</i> . . . . .	83 W. Rutland Sq. Chem., Draw., Lang., Math.
Godfrey, William Hollis, Ph.B. . . . .	<i>Needham</i> . . . . .	Needham. Chem.
Goldsmith, Clarence . . . . .	<i>Andover</i> . . . . .	Andover. App. Mech., Math., Mech. Eng., Phys., Shop.
Gonzalez, Alberto Primitivo . . . . .	<i>Monterey, Mex.</i> . . . . .	136 Chandler St. Chem., Draw., Eng., Lang., Phys.
Grabau, Philip Louis . . . . .	<i>Buffalo, N. Y.</i> . . . . .	87 Appleton St. Chem., Draw., Lang., Math.
Gray, Albert Webster . . . . .	<i>Dorchester</i> . . . . .	38 Stanley St., D. App. Mech., Civ. Eng., Geol., Hist., Lang., Phys., Pol. Sci.
Greenman, Bessie, B.A. . . . .	<i>Mystic, Conn.</i> . . . . .	Arlington. Math., Phys.
Griffin, Arthur Eugene . . . . .	<i>Winthrop</i> . . . . .	Winthrop. Chem., Draw., Eng., Lang., Math.
Gurney, Erving Rudolph . . . . .	<i>Cambridge</i> . . . . .	Cambridge. Draw., Eng., Hist., Lang., Math., Mech. Eng., Shop.
Hale, Benjamin, Jr. . . . .	<i>Newburyport</i> . . . . .	Newburyport. App. Mech., Elect. Eng., Math., Mech. Eng., Phys.
Hallstrom, Walter Augustus . . . . .	<i>Roslindale</i> . . . . .	Whitford St., Ros. Draw., Shop.
Hamburger, Charles Meier . . . . .	<i>Boston</i> . . . . .	22 Dracut St. Chem., Eng., Hist., Lang., Math., Phys., Shop.
Hamilton, Arthur Little . . . . .	<i>Fond du Lac, Wis.</i> . . . . .	112 Newbury St. Chem., Eng., Hist., Lang., Math., Min. Eng., Phys.
Hamlen, Harry Howard . . . . .	<i>Augusta, Me.</i> . . . . .	18 Holyoke St. Chem., Draw., Eng., Lang., Math., Phys.
Harahan, James Thomas, Jr. . . . .	<i>Chicago, Ill.</i> . . . . .	1096 Boylston St. Chem., Draw., Eng., Math., Mech. Eng., Phys., Shop.
Harriman, Susan Sigourney . . . . .	<i>Revere</i> . . . . .	Revere. Biol.
Harris, Ralph . . . . .	<i>Leavenworth, Kans.</i> . . . . .	377 Boylston St. Chem., Civ. Eng., Lang., Math., Min. Eng., Phys.
Harrison, Richard Carter . . . . .	<i>Braintree</i> . . . . .	Braintree. Chem., Hist., Lang.
Haskell, George Owens . . . . .	<i>Savannah, Ga.</i> . . . . .	103 Appleton St. App. Mech., Lang., Math., Mech. Eng., Phys.
Hatch, George Franklin . . . . .	<i>Dedham</i> . . . . .	Dedham. Draw., Shop.
Hathaway, Harold Winthrop . . . . .	<i>Arlington</i> . . . . .	Arlington. Arch., Draw., Hist.
Hawes, Alexander Gilchrist, Jr. . . . .	<i>San Francisco, Cal.</i> . . . . .	220 W. Springfield St. Draw., Eng., Hist., Lang., Math., Phys., Shop.
Hayden, Fred Lawrence . . . . .	<i>Fitchburg</i> . . . . .	155 Warren Ave. Chem., Eng., Hist., Lang., Math., Phys.

NAME.	HOME.	RESIDENCE.
Hayden, Joseph Alonzo . . . Chem., Draw., Eng., Lang., Shop.	<i>E. Hartford, Conn.</i>	67 Mt. Vernon St.
Hayden, Lewis Andrews . . . App. Mech., Chem., Geol., Min. Eng., Phys.	<i>Denver, Colo.</i>	1096 Boylston St.
Hazard, William Abbott . . . Chem., Civ. Eng., Draw., Eng., Lang., Math., Phys., Pol. Sci.	<i>Des Moines, Iowa</i>	W. Medford.
Heathman, Frank Boltin . . . App. Mech., Arch., Draw., Hist., Lang.	<i>Dayton, Ohio</i>	7 Follen St.
Heissler, Edward Rudolph . . . Biol., Chem., Phys.	<i>Chicago, Ill.</i>	1096 Boylston St.
Heitshu, Samuel Parks . . . Chem., Draw., Eng., Lang., Math.	<i>Lancaster, Pa.</i>	20 W. Cedar St.
Hewitt, Edwin Hawley, A.B. . . Arch., Draw., Lang., Math., Phys.	<i>Red Wing, Minn.</i>	38 St. Botolph St.
Hicks, Anna Cordelia . . . Arch., Draw., Math.	<i>Cheyenne, Wyo.</i>	96 Waltham St.
Hildreth, Edward Theodore . . . App. Mech., Draw., Elect. Eng., Mech. Eng., Phys.	<i>Brookline</i>	Brookline.
Hill, Grace Mary . . . Math.	<i>Amesbury</i>	23 Allston St., D.
Hinman, Dean . . . Civ. Eng., Draw., Eng., Hist., Lang., Math., Phys.	<i>Taunton</i>	Taunton.
Hoeffler, Philo Remington, B.S. . . Chem., Lang., Phys.	<i>Ilion, N. Y.</i>	413 Mass. Ave.
Hoit, Henry Ford . . . Arch., Draw.	<i>Chicago, Ill.</i>	563 Mass. Ave.
Holabird, Robert Grant . . . Arch., Chem., Draw., Eng., Hist., Math., Phys.	<i>Evanston, Ill.</i>	1096 Boylston St.
Holmes, Edward Lowther . . . Arch., Draw.	<i>Alameda, Cal.</i>	175 Mass. Ave.
Holmes, Merton Austin . . . Chem., Draw., Eng., Hist., Lang., Phys.	<i>Newton Highlands</i>	Newton Highlands.
Horgan, John Dennis . . . Draw., Lang., Math., Mech. Eng., Phys., Pol. Sci.	<i>Dorchester</i>	1 Leeds St., D.
Hosmer, George Leonard . . . App. Mech., Civ. Eng., Math., Phys.	<i>Woburn</i>	Woburn.
Hough, Elizabeth Eleanor . . . Biol.	<i>Boston</i>	48 Rutland Sq.
Hough, William Baldwin . . . Chem., Draw., Eng., Lang., Math.	<i>Williamsport, Pa.</i>	Newton.
House, John Henry, Jr. . . . Arch., Chem., Draw., Eng., Lang., Math., Phys., Pol. Sci.	<i>Salonica, Turkey</i>	664 Tremont St.
Howard, Harold Emmons . . . Draw., Eng., Hist., Lang., Math., Mech. Eng., Phys., Shop.	<i>Westfield</i>	102 Appleton St.
Howard, Sheldon Leavitt . . . Biol., Geol., Hist., Lang., Phys., Pol. Sci.	<i>Taunton</i>	Taunton.
Howland, John Hastings . . . App. Mech., Civ. Eng., Lang.	<i>Boston</i>	2 Wellington St.
Hoxie, Timothy Wright . . . Chem., Draw., Eng., Hist., Math., Shop.	<i>Roxbury</i>	274 Walnut Ave., R.

NAME.	HOME.	RESIDENCE.
Hubbard, Jesse Branch . . . . .	<i>Pittsfield</i> . . . . .	423 Tremont St. Arch., Draw., Lang., Pol. Sci.
Humphrey, Seth King . . . . .	<i>Boston</i> . . . . .	16 Berwick Park. Elect. Eng., Math., Phys.
Hürter, Charles Swanberg . . . . .	<i>Hyde Park</i> . . . . .	Hyde Park. Chem., Geol., Min. Eng., Phys., Pol. Sci.
Huse, Arthur Wood . . . . .	<i>Newburyport</i> . . . . .	Newburyport. Chem., Civ. Eng., Draw., Geol., Phys., Pol. Sci.
Hyde, Anna Farwell . . . . .	<i>Boston</i> . . . . .	380 Commonwealth Ave. Biol.
Hyde, William Francis . . . . .	<i>Hyde Park</i> . . . . .	Hyde Park. Draw., Shop.
Jackson, Allen Winchester . . . . .	<i>Brookline</i> . . . . .	Brookline. App. Mech., Arch., Draw., Hist.
Jackson, George Otis . . . . .	<i>Lexington</i> . . . . .	Lexington. Chem., Draw., Eng., Hist., Lang., Math.
Johnson, Arthur Albert, A.B. . . . .	<i>Irvington, Ind.</i> . . . . .	Cambridge. Civ. Eng., Draw., Phys.
Johnson, Daniel Stewart . . . . .	<i>Short Hills, N. J.</i> . . . . .	466 Mass. Ave. Chem., Draw., Eng., Math.
Johnson, Josephine Forbush . . . . .	<i>Boston</i> . . . . .	393 Beacon St. Biol.
Jones, Bassett, Jr. . . . .	<i>New York, N. Y.</i> . . . . .	549 Mass. Ave. Draw., Elect. Eng., Eng., Hist., Lang., Math., Phys., Shop.
Jones, Frederick Hooper . . . . .	<i>So. Lincoln</i> . . . . .	So. Lincoln. Chem., Lang., Phys., Pol. Sci.
Jones, Harold Wellington . . . . .	<i>So. Lincoln</i> . . . . .	So. Lincoln. Biol., Geol., Lang.
Jones, Samuel Fosdick . . . . .	<i>Cincinnati, Ohio</i> . . . . .	6 Louisburg Sq. Biol., Chem., Hist., Pol. Sci.
Jones, Sullivan Williams . . . . .	<i>New York, N. Y.</i> . . . . .	549 Mass. Ave. Chem., Draw., Eng., Lang., Math.
Kelley, Horace Alcinous . . . . .	<i>Burlington, Iowa</i> . . . . .	7 Berwick Park. Elect. Eng., Eng., Hist., Lang., Math., Mech. Eng., Phys., Pol. Sci., Shop.
Kelley, William . . . . .	<i>Lowell</i> . . . . .	16 St. James Ave. Chem., Lang., Math., Phys.
Kelly, John Francis . . . . .	<i>Passaic, N. J.</i> . . . . .	130 Chandler St. Arch., Draw., Geol., Lang., Math.
Keniston, James Augustus . . . . .	<i>Middletown, Conn.</i> . . . . .	Everett. App. Mech., Elect. Eng., Eng., Math., Mech. Eng., Phys.
Kennedy, Mildred . . . . .	<i>Readville</i> . . . . .	Readville. Biol.
King, George Ilgenfritz . . . . .	<i>Middletown, Pa.</i> . . . . .	466 Mass. Ave. App. Mech., Hist., Math., Mech. Eng., Phys., Shop.
Kingsbury, Ivy Anna . . . . .	<i>Newton</i> . . . . .	Newton. Draw.
Kleinschmidt, Frederick . . . . .	<i>Roxbury</i> . . . . .	34 Savin St., R. Pol. Sci.
Kruse, Conrad Frederick . . . . .	<i>Davenport, Iowa</i> . . . . .	312 Columbus Ave. Arch., Draw., Eng., Hist., Lang., Math.

NAME.	HOME.	RESIDENCE.
Lacaff, Florian Leo . . . . .	<i>Nevada, Mo.</i> . . . . .	369 Columbus Ave.
Arch., Draw., Eng., Hist., Lang., Math.		
Laing, Minerva Abigail . . . . .	<i>Granville, N. Y.</i> . . . . .	68 Warrenton St.
Biol., Chem., Lang.		
Lambert, Fred De Forest . . . . .	<i>Lowell</i> . . . . .	Somerville.
Biol., Chem., Lang.		
Lander, Ruth Ella . . . . .	<i>Cambridge</i> . . . . .	Cambridge.
Biol.		
Lansingh, Van Rensselaer, B.S.	<i>Chicago, Ill.</i> . . . . .	31 St. Botolph St.
App. Mech., Draw., Elect. Eng., Math., Mech. Eng., Phys.		
Larrabee, John Heber . . . . .	<i>Melrose</i> . . . . .	Melrose.
App. Mech., Civ. Eng., Geol., Hist., Lang., Math., Phys.		
Lathrop, Fred Haskins . . . . .	<i>Charlestown</i> . . . . .	10 Summer St., C.
Chem., Draw., Eng., Hist., Lang.		
Lawrence, Amos Amory, A.B. . . . .	<i>Boston</i> . . . . .	59 Commonwealth Ave.
Arch., Draw.		
Leadbetter, Florence Eugénie . . . . .	<i>Roslindale</i> . . . . .	867 South St., Ros.
Chem.		
Learnard, Harrington De Witt . . . . .	<i>Boston</i> . . . . .	50 Worcester St.
Chem., Draw., Eng., Lang., Math.		
Learned, Willis Lathrop . . . . .	<i>Watertown</i> . . . . .	Watertown.
Chem., Lang., Phys., Pol. Sci.		
Leavitt, Henry Foss . . . . .	<i>Saco, Me.</i> . . . . .	223 W. Canton St.
Civ. Eng., Draw., Eng., Hist., Math., Phys.		
Locke, Harriet Frances . . . . .	<i>Nashua, N. H.</i> . . . . .	88 Chandler St.
Arch., Draw., Hist.		
Lombard, Alfred Waldo . . . . .	<i>Wayland</i> . . . . .	Wayland.
Draw., Elect. Eng., Hist., Lang., Math., Mech. Eng., Phys., Pol. Sci.		
Long, Margaret, A.B. . . . .	<i>Hingham</i> . . . . .	Hingham.
Biol., Phys.		
Long, Zourie H. . . . .	<i>Wilkes-Barre, Pa.</i> . . . . .	23 Worcester Sq.
Lang., Pol. Sci.		
Loud, Ralph White . . . . .	<i>Weymouth</i> . . . . .	Brookline.
Civ. Eng., Geol., Lang., Math., Phys., Pol. Sci.		
Lynch, George Edward . . . . .	<i>Hyde Park</i> . . . . .	Hyde Park.
Chem., Draw., Eng., Hist., Lang., Math., Mech. Eng., Phys., Shop.		
Mabie, Harry Saxton, B.P. . . . .	<i>Roslindale</i> . . . . .	41 Brown Ave., Ros.
Arch., Draw.		
MacBride, Jamie Douglass . . . . .	<i>Arlington Heights</i> . . . . .	86 Chandler St.
Draw., Eng., Hist., Lang., Math., Mech. Eng., Phys., Shop.		
MacFarlane, David Huron . . . . .	<i>Montreal, Que.</i> . . . . .	190 W. Canton St.
Arch., Draw., Math.		
Mack, Harrington . . . . .	<i>Fort Mill, S. C.</i> . . . . .	21 Claremont Park.
Elect. Eng., Math., Phys., Shop.		
Madero, Salvador . . . . .	<i>Parras-Coahuila, Mexico</i>	136 Chandler St.
Chem., Draw., Eng., Phys.		
Manning, Alice Lee . . . . .	<i>Milton</i> . . . . .	Milton.
Chem.		
Mansfield, Frank Erastus . . . . .	<i>Boston</i> . . . . .	26 Cumberland St.
App. Mech., Civ. Eng., Lang., Phys.		

NAME.	HOME.	RESIDENCE.
McIver, Jean Bond, B.S. Biol.	Worcester	Lynn.
McKell, William, Ph.B. Chem., Min. Eng., Phys.	Chillicothe, Ohio	21 W. Cedar St.
Merrick, Charles Irving, A.B. Biol., Chem.	Holyoke	91 Newbury St.
Mills, Helen Curtis Biol.	Sharon	46 Dudley St., R.
Minnig, Frank Raymond App. Mech., Lang., Math., Mech. Eng., Phys., Pol. Sci., Shop	Reading, Pa.	73 Dartmouth St.
Mommers, Richard Chem., Phys., Pol. Sci.	So. Manchester, Conn.	543 Mass. Ave.
Morse, Henry Grant, Jr. Arch., Chem., Draw., Eng., Lang., Mat	Wilmington, Del.	6 Louisburg Sq.
Murray, Parnell Sidway Biol.	Roxbury	2 Akron Pl., R.
Nebel Herreros, Alejandro, B.S. Math.	Santiago, Chile	73 Dartmouth St.
Nelson, Alexander Howard, A. B. App. Mech., Civ. Eng.	Chambersburg, Pa.	79 St. Botolph St.
Newhall, Charles Alexander Draw., Math., Shop.	Dorchester	25 Wales St., D.
Nolte, Julius Draw., Lang., Math., Phys., Pol. Sci., Shop.	Jamaica Plain	803 Centre St., J. P.
Norris, Grace Adelaide Chem.	Chelsea	Chelsea.
Noyes, Harriet Niles Biol., Chem., Draw.	Mattoon, Ill.	464 Centre St., J. P.
O'Connell, Catherine Biol.	Charlestown	79 Chapman St., C.
Oelrich, Edward Arch., Draw., Lang.	Buffalo, N. Y.	48 So. Russell St.
Palmer, Worthington Arch., Chem., Draw., Eng., Hist., Math., Phys.	Albany, N. Y.	35 Rutland Sq.
Parsons, Willis Everett App. Mech., Chem., Lang., Mech. Eng., Pol. Sci., Shop.	Gloucester	24 Yarmouth St.
Perley, William Marshall Chem., Lang., Math., Pol. Sci.	Medford	Medford.
Phoenix, Amy Elizabeth Biol.	Boston	45 Concord Sq.
Porter, Russell Williams Arch.	Springfield, Vt.	Watertown.
Portner, Robert Francis App. Mech., Elect. Eng., Mech. Eng., Phys.	Washington, D. C.	314 Columbus Ave.
Potter, Sarah Emeline Biol.	Acworth, N. H.	14 Rockville Park, R.
Pray, Dudley Malcolm Chem., Eng., Math., Phys.	So. Boston	508 Broadway, S. B.
Prime, Harold Augustus App. Mech., Elect. Eng., Math., Mech. Eng., Phys.	Brighton	434 Washington St., B.

NAME.	HOME.	RESIDENCE.
Proctor, Charles Frederic . . . .	<i>Boston</i> . . . .	247 W. Newton St. Chem., Lang., Math.
Prosser, Reay Cooper . . . .	<i>St. Louis, Mo.</i> . . . .	6 Rutland Sq. App. Mech., Arch., Draw., Geol., Lang., Pol. Sci.
Rich, Lamont . . . .	<i>No. Adams</i> . . . .	9 Temple Ct. Civ. Eng., Lang., Phys.
Richardson, Frank Linden . . . .	<i>Concord</i> . . . .	Concor I. Biol., Chem., Draw., Eng., Lang.
Richardson, Phillip, A.B. . . .	<i>Brookline</i> . . . .	Brookline. Arch., Draw.
Richmond, Miles Standish . . . .	<i>Brookline</i> . . . .	Brookline. Arch., Chem., Draw., Eng., Lang., Math.
Ritchie, Edward Warren . . . .	<i>Newton Highlands</i> . . . .	Newton Highlands. App. Mech., Arch., Draw., Hist.
Robinson, Argyle Eggleston . . . .	<i>Chicago, Ill.</i> . . . .	563 Mass. Ave. Arch., Draw.
Robinson, George Avery . . . .	<i>Anchorage, Ky.</i> . . . .	22 Berwick Park. Arch., Chem., Draw., Eng., Lang., Math.
Rolfe, Henry Pettingell . . . .	<i>Newburyport</i> . . . .	Newburyport. App. Mech., Civ. Eng.
Rumery, Ralph Rollins . . . .	<i>Portland, Me.</i> . . . .	Cambridge. Chem., Civ. Eng., Draw., Math., Mech. Eng., Phys.
Russell, Edward Francis . . . .	<i>Lowell</i> . . . .	Lowell. Chem., Draw., Eng., Math., Mech. Eng., Phys.
Rutherford, Eugene White . . . .	<i>Brooklyn, N. Y.</i> . . . .	114 W. Concord St. Math., Mech. Eng., Shop.
Ryan, Ida Annah . . . .	<i>Waltham</i> . . . .	Waltham. Arch., Draw., Math.
Sanchez Batista, Pedro . . . .	<i>Nuevitas, Cuba</i> . . . .	41 St. Botolph St. Chem., Eng., Hist., Math., Shop.
Sargent, Albert Ellwood . . . .	<i>Belmont</i> . . . .	Belmont. App. Mech., Elect. Eng., Lang., Math., Mech. Eng., Phys., Pol. Sci.
Sargent, Homer Earle, Jr., Fh.B.	<i>Chicago, Ill.</i> . . . .	86 Huntington Ave. App. Mech., Elect. Eng., Mech. Eng., Phys.
Sawyer, Horace Russell . . . .	<i>Rye Beach, N. H.</i> . . . .	16 Concord Sq. Chem., Math., Mech. Eng., Phys., Shop.
Sawyer, Ralph Edmund . . . .	<i>Roxbury</i> . . . .	196 Walnut Ave., R. Arch., Draw.
Schlesinger, Helen . . . .	<i>Brookline</i> . . . .	Brookline. Biol., Chem.
Schmidt, Herman Henry . . . .	<i>Melville, N. Y.</i> . . . .	16 Marlborough St. Chem., Civ. Eng., Draw., Math., Phys.
Scudder, Heyward, B.A. . . .	<i>New York, N. Y.</i> . . . .	437 Boylston St. Chem., Geol., Math., Phys.
Seaver, Henry Morse . . . .	<i>W. Roxbury</i> . . . .	Bellevue St., W. R. Arch., Draw.
Sheak, Edwin Ruthven . . . .	<i>Reading</i> . . . .	Reading. Biol., Eng., Hist., Lang., Pol. Sci.
Shumaker, Louis William . . . .	<i>Ortonville, Minn.</i> . . . .	209 Huntington Ave. Draw., Elect. Eng., Hist., Lang., Math., Mech. Eng., Phys., Shop.

NAME.	HOME.	RESIDENCE.
Sickman, James Francis . . . . .	<i>Holyoke</i> . . . . .	1096 Boylston St.
App. Mech., Civ. Eng., Draw., Geol., Lang., Phys., Pol. Sci.		
Slavens, John Heber . . . . .	<i>Kansas City, Mo.</i> . . . . .	24 Yarmouth St.
Chem., Civ. Eng., Draw., Eng., Math., Min. Eng., Phys.		
Slocum, William Whitaker . . . . .	<i>Providence, R. I.</i> . . . . .	74 Rutland St.
Chem., Eng., Hist., Lang.		
Smith, George Lawrence, A.B. . . . .	<i>Cambridge</i> . . . . .	Cambridge.
Arch., Draw., Hist.		
Smith, Granville . . . . .	<i>Washington, D. C.</i> . . . . .	549 Mass. Ave.
Lang., Math., Phys.		
Smith, Harry Austin . . . . .	<i>Wakefield</i> . . . . .	Cambridge.
Chem., Draw., Eng., Lang., Math.		
Smith, Theodore Brooks . . . . .	<i>Cleveland, Ohio</i> . . . . .	6 Rutland Sq.
Elect. Eng., Lang., Math., Phys.		
Smith, William Henry . . . . .	<i>Altoona, Pa.</i> . . . . .	98 Kendall St.
Draw., Lang., Math.		
Snow, Frank Whipple . . . . .	<i>Newburyport</i> . . . . .	Newburyport.
Biol., Chem., Draw., Eng., Lang.		
Snow, Frederick Willis . . . . .	<i>Lynn</i> . . . . .	Lynn.
Chem., Eng., Hist., Lang., Math., Mech. Eng., Min. Eng., Phys.		
Sohier, Louis Amory . . . . .	<i>Concord</i> . . . . .	Concord.
Chem., Draw., Eng., Hist., Lang., Phys., Shop.		
Springer, Ernest Roger . . . . .	<i>Newton</i> . . . . .	Newton.
Draw., Elect. Eng., Lang., Math., Mech. Eng., Phys., Pol. Sci.		
Stark, Helen Gertrude . . . . .	<i>Charlestown</i> . . . . .	Navy Yard, C.
Biol.		
Stebbins, Roland William . . . . .	<i>Springfield</i> . . . . .	85 Pinckney St.
Draw., Eng., Hist., Lang., Math., Mech. Eng., Phys., Shop.		
Stillings, Samuel Warren . . . . .	<i>Boston</i> . . . . .	205 St. Botolph St.
Arch., Draw., Lang., Math., Phys.		
Stone, Jacob, Jr. . . . .	<i>Newburyport</i> . . . . .	549 Mass. Ave.
Arch., Chem., Draw., Eng., Hist., Lang., Math., Phys.		
Stouder, John Burton, B.E. . . . .	<i>Gravity, Ia.</i> . . . . .	137 School St., R.
App. Mech., Civ. Eng.		
Strickland, William Randolph . . . . .	<i>Brookline</i> . . . . .	Brookline.
App. Mech., Civ. Eng., Geol., Phys.		
Strong, Mary Baker . . . . .	<i>Boston</i> . . . . .	258 Beacon St.
Biol.		
Stuart, Harve Reed . . . . .	<i>Newark, N.Y.</i> . . . . .	40 Rutland Sq.
Draw., Math., Mech. Eng., Phys.		
Sturtevant, Edward . . . . .	<i>Brookline</i> . . . . .	Brookline.
Biol., Lang., Phys., Pol. Sci.		
Sturtevant, Mary . . . . .	<i>Brookline</i> . . . . .	Brookline.
Biol.		
Stutchkoff, Samuel . . . . .	<i>Boston</i> . . . . .	1043 Washington St.
Draw., Eng., Hist., Lang., Math., Mech. Eng., Phys., Shop.		
Sutliff, Walter Hannen . . . . .	<i>Albany, N. Y.</i> . . . . .	35 Rutland Sq.
Arch., Draw., Eng., Hist., Lang., Phys.		
Sweetser, Charles Herbert . . . . .	<i>Wakefield</i> . . . . .	21 Claremont Park.
App. Mech., Civ. Eng., Lang.		



NAME.	HOME.	RESIDENCE.
Tew, William Henry . . . . .	<i>Jamestown, N. Y.</i>	266 St. Botolph St. Draw., Lang., Math., Pol. Sci., Shop.
Tilton, Mary Azuba . . . . .	<i>Concord</i>	108 Mt. Vernon St. Biol.
Todd, Thomas, Jr. . . . .	<i>Concord</i>	Concord. Chem., Draw., Eng., Hist., Lang., Math., Mech. Eng., Phys., Shop.
Tower, Samuel Francis, A.B. . . . .	<i>Boston</i>	English High School. Biol.
Townsend, George Richards . . . . .	<i>New York, N. Y.</i>	549 Mass. Ave. Draw., Eng., Hist., Lang., Math., Mech. Eng., Phys., Shop.
Tucker, Frank Stevenson . . . . .	<i>Marblehead</i>	Marblehead. App. Mech., Lang., Math., Mech. Eng., Phys., Shop.
Tucker-Cornell, Idair . . . . .	<i>Salem</i>	Salem. Biol.
Turner, Lawrie Humphrey . . . . .	<i>Medford</i>	Medford. Chem., Eng., Hist., Lang., Math., Phys.
Underwood, Frank Edward . . . . .	<i>Auburndale</i>	Auburndale. Draw., Lang., Math., Mech. Eng., Phys., Shop.
Underwood, Howard Coggin . . . . .	<i>Natick</i>	Natick. Chem., Math., Mech. Eng., Phys., Pol. Sci., Shop.
Underwood, William Lyman . . . . .	<i>Belmont</i>	Belmont. Biol.
Usher, Susannah . . . . .	<i>Cambridge</i>	Cambridge. Biol., Draw., Eng., Geol., Hist., Lang., Pol. Sci.
Vahlkamp, Henry Rudolph . . . . .	<i>St. Louis, Mo.</i>	98 Pembroke St. App. Mech., Arch., Draw., Hist., Lang.
Vining, Robert McAllaster . . . . .	<i>So. Weymouth</i>	So. Weymouth. App. Mech., Lang., Math., Mech. Eng., Phys., Pol. Sci., Shop.
Vogt, Oscar George . . . . .	<i>Washington, D. C.</i>	314 Columbus Ave. Arch., Chem., Draw., Eng., Lang., Math.
Wallace, Robert Bruce . . . . .	<i>Cleveland, Ohio</i>	549 Mass. Ave. App. Mech., Lang., Math., Mech. Eng., Phys., Pol. Sci.
Walls, John . . . . .	<i>Lewisburg, Pa.</i>	399 Mass. Ave. Draw., Elect. Eng., Hist., Mech. Eng., Phys., Shop.
Weaver, Erasmus Morgan . . . . .	<i>Fort Warren</i>	Fort Warren. Lang., Mech. Eng.
Weeks, Merle . . . . .	<i>Washington, D.C.</i>	21 W. Cedar St. Arch., Draw., Eng., Hist., Lang., Math., Phys.
Weimer, Edgar Arthur . . . . .	<i>Lebanon, Pa.</i>	314 Columbus Ave. App. Mech., Lang., Math., Mech. Eng., Phys., Shop.
Werner, Frank Albert . . . . .	<i>Akron, Ohio</i>	1096 Boylston St. Draw., Eng., Hist., Lang., Math., Pol. Sci., Shop.
Wescott, Jennie Smith . . . . .	<i>Boston</i>	171 Mass. Ave. Biol.
West, William Eaton . . . . .	<i>Cambridge</i>	Cambridge. Chem., Eng., Hist., Lang., Phys.
Whitehouse, Morris Homans . . . . .	<i>Portland, Oreg.</i>	26 Berwick Park. Chem., Draw., Eng., Lang., Math.
Whiting, Eleanor Felton . . . . .	<i>Boston</i>	Trinity Court. Biol., Chem.

NAME.	HOME.	RESIDENCE.
Wiard, Edward Saxon . . . . .	<i>Boston</i> . . . . .	78 Chandler St. Chem., Civ. Eng., Lang., Min. Eng., Phys., Pol. Sci.
Wightman, Fred . . . . .	<i>Oskaloosa, Iowa</i> . . . . .	547 Mass. Ave. Chem., Draw., Eng., Lang., Math., Shop.
Wignall, Lily . . . . .	<i>Boston</i> . . . . .	20 St. James Ave. Biol.
Wiley, Nettie Morton . . . . .	<i>Roxbury</i> . . . . .	1 Bower Park, R. Chem., Phys.
Willis, Raymond Smith . . . . .	<i>Evanston, Ill.</i> . . . . .	21 St. Botolph St. Chem., Civ. Eng., Eng., Lang., Phys., Pol. Sci.
Wilson, Alda, B.C.E. . . . .	<i>Harper, Iowa</i> . . . . .	19 Claremont Park. Arch., Draw., Lang.
Wilson, Elmina, C.E. . . . .	<i>Harper, Iowa</i> . . . . .	19 Claremont Park. Arch., Draw., Geol., Lang.
Wing, Ida Ceola Stratton . . . . .	<i>Jamaica Plain</i> . . . . .	49 Boylston St., J. P. Chem.
Winslow, George Carlos, Jr. . . . .	<i>Boston</i> . . . . .	12 Yarmouth St. Chem., Civ. Eng., Eng., Hist., Math., Min. Eng., Phys.
Witherby, Edwin Chaplin, B.S. . . . .	<i>Worcester</i> . . . . .	4 Malborough St. App. Mech., Chem., Draw., Mech. Eng., Phys.
Wright, George Henry . . . . .	<i>Boston</i> . . . . .	104 Dartmouth St. Biol., Eng., Geol., Pol. Sci.
Wyzanski, Isaac . . . . .	<i>Boston</i> . . . . .	9 Sheafe St. Chem., Draw., Math.
Zirngiebel, Frances . . . . .	<i>Roxbury</i> . . . . .	61 Bower St., R. Biol.

## SUMMARY.

GRADUATE STUDENTS . . . . .	82	REGULAR STUDENTS, 2nd year . . . . .	182
REGULAR STUDENTS, 4th year . . . . .	194	“ “ 1st “ . . . . .	286
“ “ 3rd “ . . . . .	198	SPECIAL STUDENTS . . . . .	327
Total . . . . .			1,269
Deduct names counted twice . . . . .			71
			<u>1,198</u>

## Lowell Free Courses of Instruction.

---

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

These courses are more or less varied from year to year by the omission or interchange of particular subjects, but include in their entire scope, instruction in Mathematics, Mechanics, Physics, Drawing, Chemistry, Geology, Natural History, Biology, English, French, German, History, Navigation and Nautical Astronomy, Architecture, and Engineering.

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

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

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

1. Candidates must have attained the age of eighteen years.
2. Their applications must be made in writing, addressed to the Secretary of the Institute, specifying the course or courses they desire to attend, mentioning their present or

prospective occupations, and, when the course is of a nature demanding preparation, stating the extent of their preliminary training.

The number of students in each class is necessarily limited.

The subjects for the current year are as follows: —

I. GRAPHIC STATICS, WITH APPLICATIONS TO ROOF TRUSSES AND ARCHES. (Introductory lectures on General Principles of Statics.) Twelve lectures by Assistant Professor Sondericker.

II. STRUCTURAL GEOLOGY, OR THE ARCHITECTURE OF THE EARTH. Twelve lectures by Assistant Professor Crosby.

III. ELEMENTS OF PETROGRAPHY. Twelve lectures by Assistant Professor Barton.

IV. GENERAL CHEMISTRY OF THE NON-METALLIC ELEMENTS. Twelve lectures by Associate Professor Pope.

V. THE DEVELOPMENT OF PROSE FICTION IN FRANCE, BEGINNING WITH RABELAIS. Twelve lectures (in French) by Professor van Daell.

VI. INTEGRAL CALCULUS.<sup>1</sup> Twelve lectures by Assistant Professor Bartlett.

VII. SOME METHODS OF DETERMINING LATITUDE, TIME, AND LONGITUDE WITH AN ENGINEER'S TRANSIT. Twelve lectures by Assistant Professor Robbins.

VIII. ELEMENTARY ALGEBRA. Twelve lectures by Assistant Professor Skinner.

IX. METALLURGY OF THE MINOR METALS, I: ALUMINUM, NICKEL and COBALT, ZINC AND CADMIUM. Twelve lectures by Associate Professor Hofman.

X. THEORY OF SOUND, WITH EXPERIMENTAL ILLUSTRATIONS. Twelve lectures by Assistant Professor Clifford.

XI. THE CAMPAIGNS OF SARATOGA AND CHANCELLORSVILLE (1777 AND 1863). Twelve lectures by Captain Bigelow.

XII. GENERAL CHEMISTRY OF THE METALLIC ELEMENTS. Twelve lectures by Assistant Professor Bardwell.

XIII. HISTORY OF THE UNITED STATES SINCE THE CIVIL WAR. Twelve lectures by Associate Professor Currier.

XIV. RAILROADS: PROBLEMS IN LOCATION AND TRACKWORK. Twelve lectures by Professor Allen.

XV. DIFFERENTIAL EQUATIONS.<sup>1</sup> Twelve lectures by Assistant Professor Bailey.

XVI. SCHILLER AND GOETHE. Twelve lectures (in German) by Associate Professor Dippold.

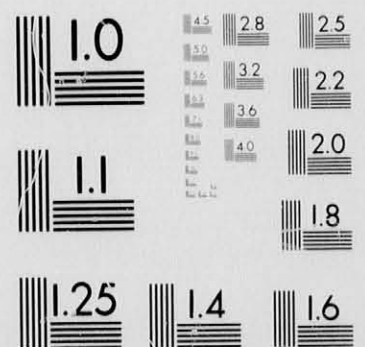
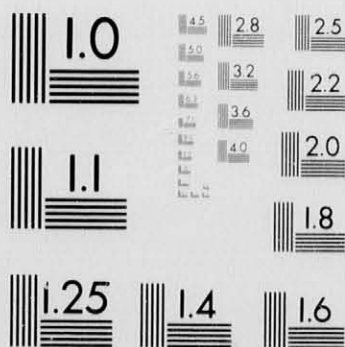
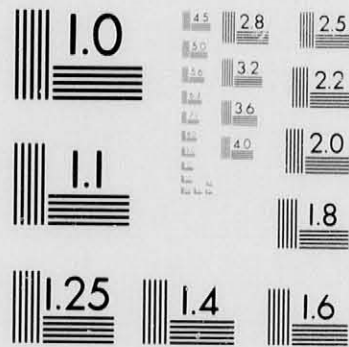
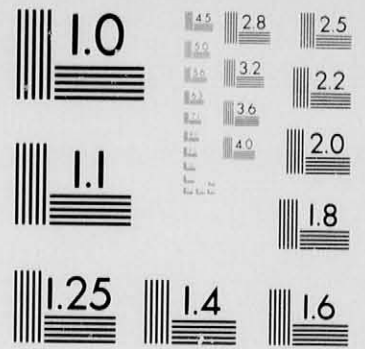
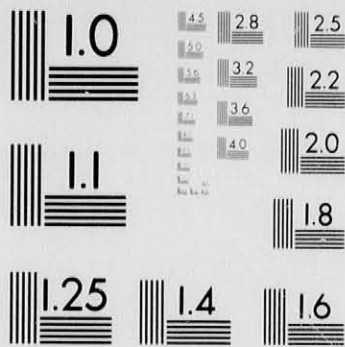
<sup>1</sup> These two courses (VI. and XV.), form the third part of a consecutive series begun in 1894, but are open to applicants having some knowledge of the Differential Calculus.

XVII. GEODETIC SURVEYING. Twelve lectures by Professor Burton.

XVIII. THE PROGRESS OF CHEMISTRY DURING THE LAST DECADE. Twelve lectures by Assistant Professor Noyes.

XIX. ELLIPTIC FUNCTIONS. Twelve lectures by Assistant Professor Woods.

XX. THE CHEMISTRY OF DAILY LIFE. Twelve lectures by Associate Professor Talbot.



M. I. T. ANNUAL CATALOGUES AND BULLETINS

1896/97

03 OF 04

## 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 in the building of the Institute on Garrison Street. It 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. 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 by Miss Harriet J. Ford.



**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 freehand 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 the last Monday of September. The number of students in the school, including those to be admitted, will be limited to fifty-three. Examinations for applicants for admission will be held at 9 A. M. on Tuesday, Wednesday, and Thursday of the third week in September. Students are required to be regular in their attendance, the hours being from 9.30 A. M. to 12 M., and from 1 P. M. to 3.30 P. M. Only those students can be retained in the school who, after a fair and patient trial, are found to have some aptitude for the work. At the close of each half-year, the Director will, with the approval of the President of the Institute, convey the needed information to such students as shall be found gravely deficient in 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.

### LOWELL SCHOOL OF DESIGN.

NAME.	HOME.	RESIDENCE.
Adams, Lucy Mary . . . . .	<i>Hyde Park</i> . . . . .	Hyde Park.
Alger, John Herbert . . . . .	<i>Reading</i> . . . . .	Reading.
Allen, Winthrop Blakesley . . . . .	<i>Newton</i> . . . . .	Newton.
Barnard, Walter Mason . . . . .	<i>Granville, N. Y.</i> . . . . .	361 Columbus Ave.
Barrett, Jessie Gertrude . . . . .	<i>Malden</i> . . . . .	Malden.
Baxter, Clara Virginia . . . . .	<i>Dorchester</i> . . . . .	100 Melville Ave., E
Beebe, Adelaide Sophia . . . . .	<i>Hampden</i> . . . . .	135 W. Concord St.
Bliss, Nellie May . . . . .	<i>Quincy</i> . . . . .	Quincy.
Bucknam, Grace Winslow . . . . .	<i>Roxbury</i> . . . . .	5 Akron St., R.
Chamberlain, Harriette Louise . . . . .	<i>Boston</i> . . . . .	141 Tremont St.
Danforth, Homer Wallace . . . . .	<i>No. Woburn</i> . . . . .	No. Woburn.
Davis, Grace Hammond . . . . .	<i>Littleton, N. H.</i> . . . . .	45 Julian St., R.
Dow, Minnie Ella . . . . .	<i>Franklin</i> . . . . .	Franklin.
Dwyer, Elizabeth Loretta . . . . .	<i>Cambridgeport</i> . . . . .	Cambridgeport.
Falvey, Katharine . . . . .	<i>Roxbury</i> . . . . .	2 Hazelwood St., R.
Fiske, Edith Porter . . . . .	<i>Cambridgeport</i> . . . . .	Cambridgeport.
Gillette, Mary Louise . . . . .	<i>Newton Highlands</i> . . . . .	Newton Highlands.
Goodrich, Grace Rosetta . . . . .	<i>Roxbury</i> . . . . .	32 Whiting St., D.
Gray, Reuben Forrest . . . . .	<i>So. Manchester, Conn.</i> . . . . .	98 Pembroke St.
Guell, Alice Frances . . . . .	<i>Boston</i> . . . . .	22 Buckingham St.
Harvey, Elvira Toppan . . . . .	<i>Newton Highlands</i> . . . . .	Newton Highlands.
Hill, Henry Brooks Stephen . . . . .	<i>Roxbury</i> . . . . .	48 Centre St., R.
Hilton, Rena Evelyn . . . . .	<i>Hyde Park</i> . . . . .	Hyde Park.
Hines, Edward Waldron . . . . .	<i>Danvers</i> . . . . .	Danvers.
Hosmer, George Hammond . . . . .	<i>Everett</i> . . . . .	Everett.
Humphrey, Jane Marion Kaulbach . . . . .	<i>Boston</i> . . . . .	31 E. Concord St.
Jordan, Carlotta May . . . . .	<i>Boston</i> . . . . .	A 1 Berwick Park.
Kidger, Lottie Henson . . . . .	<i>Everett</i> . . . . .	Everett.
Lasker, Florence Ernestine . . . . .	<i>Boston</i> . . . . .	25 Berwick Park.
McGrath, Benedict Vincent . . . . .	<i>Mattapan</i> . . . . .	94 Corbett St., M.
Orcutt, Leon Forest . . . . .	<i>Hyde Park</i> . . . . .	Hyde Park.
Palmer, Ernest Packard . . . . .	<i>So. Boston</i> . . . . .	660 E. 6th St., S. B.
Parker, James Burpee . . . . .	<i>Newtonville</i> . . . . .	Newtonville.
Pike, Helen Packard . . . . .	<i>Worcester</i> . . . . .	Worcester.

NAME.	HOME.	RESIDENCE.
Poor, Frederick Walton . . . .	<i>Derry, N. H.</i> . . . .	Derry, N. H.
Richardson, Helen Louise . . . .	<i>Roxbury</i> . . . .	47 Fort Ave., R.
Sargent, Ethel Marion . . . .	<i>Roxbury</i> . . . .	77 Waverly St., R.
Shackford, Charles Lee . . . .	<i>East Weymouth</i> . . . .	E. Weymouth.
Stanton, Walter Tucker . . . .	<i>East Onondaga, N. Y.</i>	5 Concord Sq.
Symonds, Eliza Tuttle . . . .	<i>Hyde Park</i> . . . .	Hyde Park.
Taggard, Harriet Sophia . . . .	<i>Nashua, N. H.</i> . . . .	130 Huntington Ave.
Thuresson, Maude May . . . .	<i>So. Boston</i> . . . .	98 G St., S. B.
Tileston, Millie Houghton . . . .	<i>Dorchester</i> . . . .	Tileston Place, D.
Tripp, Herbert Lyman . . . .	<i>Middleboro</i> . . . .	Middleboro.
Waterman, James Copeland . . . .	<i>Hanover</i> . . . .	Hanover.
Wheeler, Bessie Baldwin . . . .	<i>Dorchester</i> . . . .	741 Dudley St., D.
Wood, Beulah Locke . . . .	<i>Roslindale</i> . . . .	Eldredge St., R.
Wright, Myra . . . .	<i>Boston</i> . . . .	59 Chandler St.

## Alumni Association.

---

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

Its officers for the current year are: —

*President:* JOHN R. FREEMAN, '76.

*Vice-President:* EDWIN C. MILLER, '79.

*Secretary:* A. H. GILL, '84, Massachusetts Institute of Technology.

*Executive Committee:* THE PRESIDENT, VICE-PRESIDENT, AND SECRETARY, GEORGE J. FORAN, '83, CHARLES W. TAINTOR, '93.

---

## THE TECHNOLOGY CLUB.

The object of the Club is to promote the welfare of the Institute and the common social interests of its past and present officers and students. The Club-house is at No. 71 Newbury Street, nearly opposite the Rogers Building, and the membership is at present over five hundred, including graduates and other former students, members of the Corporation and instructing staff, and undergraduates.

The officers for the current year are: —

*President:* JAMES P. MUNROE, '82.

*Vice-President:* HENRY M. HOWE, '71.

*Secretary:* W. Z. RIPLEY, '90.

*Treasurer:* EDWIN C. MILLER, '79.

*Chairman of House Committee:* Prof. WILLIAM T. SEDGWICK.

*Chairman of Membership Committee:* ARTHUR T. BRADLEE, '88.

The Executive Committee includes the above and the Secretary of the Institute, *ex officio*.

THE NORTHWESTERN ASSOCIATION, MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

*President*: FRANK WELLS, '70.

*Vice-President*: B. R. T. COLLINS, '88.

*Secretary and Treasurer*: E. M. HAGAR, '93,  
554 The Rookery, Chicago, Ill.

*Executive Committee*: THE PRESIDENT, VICE-PRESIDENT, SECRETARY AND TREASURER, R. H. PIERCE, '85, SOLOMON STURGES, '87.

Monthly dinners at "The Bismarck," 180 Randolph St., on the sixteenth of each month, 6.30 P.M. All Institute men are invited.

Eleventh Annual Banquet, at the "Technical Club," January 16, 1897.

---

THE WESTERN ASSOCIATION, MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

*President*: EDWARD W. ROLLINS, '71.

*Vice-President*: BRADFORD H. LOCKE, '72.

*Secretary and Treasurer*: FRANK E. SHEPARD, '87, 924 Washington Ave., Denver, Colo.

---

THE M. I. T. SOCIETY OF NEW YORK.

*Executive Committee*: GEORGE L. HEINS, '82; HARVEY S. CHASE, '83; FRANK A. PICKERNELL, '85; EDWARD D. BROWN, '90, ALEX. RICE MCKIM, *Secretary and Treasurer*, 106 East Twenty-third St., New York, N. Y.

Annual Meeting first Saturday after February 1.

---

THE CONNECTICUT VALLEY ASSOCIATION, M. I. T.

*Executive Committee*: GUY KIRKHAM, '87, *Chairman*, Springfield, Mass.; HENRY SOUTHER, '87; N. P. A. CARTER, '87; JAMES S. NEWTON, '88; HENRY A. FRANCIS, '83.

---

THE TECH SOCIETY OF PHILADELPHIA.

*Secretary-Treasurer*: LUTHER K. YODER, '95.

*Executive Committee*: AMOS J. BOYDEN, '75; WILFRED LEWIS, '75; AUGUSTUS B. STOUGHTON, '86; SAMUEL S. SADTLER, '95.

Annual Dinner second Saturday in November; Semi-annual Dinner in April.

## Register of Graduates.

---

For names of deceased graduates see the Alphabetical List, page 278.

The Roman numerals in the column marked "Course" denote the course in which the Graduate received the degree of S. B., as follows:—

- |  |  |   |
|--|--|---|
| I. Civil Engineering.<br>II. Mechanical Engineering.<br>III. Mining Engineering and Metallurgy.<br>IV. Architecture.<br>V. Chemistry.<br>VI. Electrical Engineering. |  | VII. Biology.<br>VIII. Physics.<br>IX. General Studies.<br>X. Chemical Engineering.<br>XI. Sanitary Engineering.<br>XII. Geology. |
| XIII. Naval Architecture.  |  |   |

Courses no longer maintained are Sci. and Lit., Science and Literature, Phil., Philosophy, and Elective.

### 1868.

NAME AND ADDRESS.	COURSE.	OCCUPATION.
ELLERY C. APPLETON . . . Westboro, Mass.	III.	Civil Engineer ; Assistant Engineer, Metropolitan Water Board.
WHITNEY CONANT . . . Long Branch, N. J.	III.	Secretary, Long Branch Water Supply Co.
ELI FORBES . . . Clinton, Mass.	Sci. and Lit.	Chemist, Lancaster Mills.
CHARLES C. GILMAN . . . Marshalltown, Iowa.	III.	General Contractor.
CHAS. E. GREENE, A.M., C.E. Ann Arbor, Mich.	I.	Professor of Civil Engineering ; Dean, Department of Engineering, University of Michigan.
ALBERT F. HALL . . . 265 Third St., East Cambridge, Mass.	II.	Constructing Engineer, The George F. Blake Manufacturing Co.
WILLIAM E. HOYT . . . Rochester, N. Y.	I.	Chief Engineer, Buffalo, Rochester, & Pittsburgh R. R.
ROBERT H. RICHARDS . . . Boston, Mass.	III.	Professor of Mining Engineering and Metallurgy, Mass. Institute of Technology.
WALTER H. SEARS . . . Plymouth, Mass.	I.	Civil Engineer.
JOSEPH STONE . . . 53 State St., Boston.	I.	In Business.

**1868. — Continued.**

NAME AND ADDRESS.	COURSE.	OCCUPATION.
BRYANT P. TILDEN . . . Jamestown, N. Dak.	III.	Chief Engineer, Duluth, Pierre, & Black Hills R. R.
JAMES P. TOLMAN . . . 115 Congress St., Boston.	III.	President, Samson Cordage Works.

**1869.**

WILLIAM H. BAKER . . . Fitchburg, Mass.	I.	Consulting Engineer.
HOWARD A. CARSON . . . 20 Beacon St., Boston.	I.	Chief Engineer, Boston Transit Commission.
J. RAYNER EDMANDS . . . Cambridge, Mass.	II.	Assistant, Harvard College Observatory.
CHANNING WHITAKER . . . Tyngsborough, Mass.	II.	Occupied with Questions of Infringement and Patentability for the Lowell Machine Shop (Lowell, Mass.).

**1870.**

CHARLES R. CROSS . . . Boston, Mass.	Sci. and Lit.	Thayer Professor of Physics; Director of the Rogers Laboratory, Mass. Institute of Technology.
RUSSELL H. CURTIS . . . 184 Dearborn St., Chicago, Ill.	I.	Lawyer.
CHARLES W. HINMAN . . . 63 Beverly St., Boston.	III.	Manager, Nathaniel Tufts Mefer Co.
SAMPSON D. MASON . . . Tacoma, Wash.	I.	Assistant Purchasing Agent, Northern Pacific R. R.
N. FREDERICK MERRILL . . . Burlington, Vt.	V.	Professor of Chemistry, University of Vermont.
THEODORE F. TILLINGHAST . . . 37 Eighth St., New Bedford, Mass.	I.	
EDMUND K. TURNER . . . 53 State St., Boston.	I.	Civil Engineer.
DANIEL W. WILLARD . . . Redlands, Cal.	II.	Architect.
LAURENCE F. J. WRINKLE . . . 646 Market St., San Francisco, Cal.	III.	Mining Engineer.

**1871.**

FOSTER E. L. BEAL . . . 1633 Nineteenth St., N. W., Washington, D. C.	I.	Assistant Biologist, Biological Survey, U. S. Department of Agriculture.
EDWARD H. FOOTE . . . 31 Commercial St., Boston.	I.	Of the Firm of Skilton, Foote & Co., Manufacturers of Pickles.
FRANK L. FULLER . . . 12 Pearl St., Boston.	I.	Civil and Hydraulic Engineer.

**1871. — Continued.**

NAME AND ADDRESS.	COURSE.	OCCUPATION.
HENRY M. HOWE, A.M. . . . 287 Marlborough St., Boston.	III.	Consulting Metallurgist; Lecturer on Metallurgy, Mass. Institute of Technology.
ALBERT H. HOWLAND, A.M. . . . 60 Congress St., Boston.	I.	Civil Engineer.
G. RUSSELL LINCOLN . . . . Boston, Mass.	III.	Instructor in Sanitary Chemistry, Mass. Institute of Technology.
GEORGE H. PRATT . . . . . 31 Tenth St., Long Island City, N. Y.	V.	Superintendent for D. D. Williamson & Co., Manufacturing Chemists.
EDWARD W. ROLLINS . . . . 53 State St., Boston.	III.	Banker, E. H. Rollins & Sons.
CHARLES F. STONE . . . . . Waltham, Mass.	III.	Treasurer, Waltham Savings Bank.
ISAIAH S. P. WEEKS . . . . 1327 H St., Lincoln, Neb.	I.	Chief Engineer, Burlington & Missouri River R. R. in Nebraska.
RANDAL WHITTIER . . . . . Columbia Bldg., Louisville, Ky.	V.	Cashier, Kentucky Branch Office, New York Life Insurance Co.

**1872.**

C. FRANK ALLEN . . . . . Boston, Mass.	I.	Professor of Railroad Engineering, Mass. Institute of Technology.
BENJAMIN E. BREWSTER . . . 39 Court St., Boston.	III.	Stock Raising.
WILLIAM B. DODGE . . . . . Columbus, Ohio.	I.	Scale Inspector, Pittsburgh, Cincinnati, Chicago, & St. Louis Ry.
FREDERIC A. EMMERTON . . . 9 Bratenahl Bldg., Cleveland, O.	V.	Analytical Chemist and Metallurgist.
JAMES A. HERRICK . . . . . Wyncote, Montgomery Co., Pa.	V.	Consulting Engineer and Contractor for Steel Plants, Furnaces, etc. (Twenty-third St. and Washington Ave., Philadelphia, Pa.).
JAMES M. HODGE . . . . . Big Stone Gap, Va.	III.	Geologist and Engineer.
BRADFORD H. LOCKE . . . . . Denver Club, Denver, Colo.	III.	Mining Engineer.
CHAS. S. MINOT, S.D. (Harv.) . 688 Boylston St., Boston.	V.	Professor of Histology and Human Embryology, Harvard Medical School.
MAURICE B. PATCH . . . . . 1 Austin St., Buffalo, N. Y.	III.	Superintendent, Buffalo Smelting Works, Calumet & Hecla Mining Co.
WALTER SHEPARD, A.B. . . . 4 Arion St., Dorchester, Mass.	I.	Chief Engineer, Boston & Albany R. R.
RICHARD H. SOULE, A.B. . . . Roanoke, Va.	II.	Superintendent of Motive Power, Norfolk & Western R. R.
CLARENCE STUART WARD . . . 27 School St., Boston.	III.	Lawyer.



1873.

NAME AND ADDRESS.	COURSE.	OCCUPATION.
AMORY AUSTIN, A.B. . . . .	V.	
4 Redwood St., Newport, R. I.		
GEORGE W. BLODGETT . . . .	I.	Electrical Engineer, Boston & Albany R. R.; Consulting Electrician.
Central St., Auburndale, Mass.		
WILLIAM E. BROTHERTON . . .	V.	With Burckhardt & Co.
Cincinnati, Ohio.		
SAMUEL M. FELTON . . . . .	I.	President and Receiver, Cincinnati, New Orleans, & Texas Pacific Ry.; Presi- dent, Louisville Southern R. R.; Re- ceiver, Kentucky & Indiana Bridge Co.
Odd Fellows Temple, Seventh & Elm Sts., Cincinnati, Ohio.		
FREDERICK L. FISHER . . . .	I.	Insurance Agent and Broker (35 Kilby St., Boston).
Medway, Mass.		
FREDERICK GUILD, JR. Sci. and Lit.		
Hingham, Mass.		
W. DALE HARRIS . . . . .	I.	Managing Director and Acting Chief Engi- neer, Ottawa & Gatineau Ry. and Pontiac Pacific Ry.
237 MacLaren St., Ottawa, Ont.		
CLAR. L. HOWES, A.B., M.D. II.	II.	Physician.
Hanover, Mass.		
FRANK B. MORSE . . . . .	I.	Engineering Director, Compañia minera y beneficia dora.
Tlalchichilpa, Mexico, Mex.		
GEORGE PHILLIPPS . . . . .	III.	
Green Harbor, Mass.		
HENRY A. PHILLIPS . . . . .	IV.	Architect.
120 Tremont St., Boston.		
ELLEN H. RICHARDS, A.M. V.	V.	Instructor in Sanitary Chemistry, Mass. Institute of Technology.
Boston, Mass.		
HENRY L. RIPLEY . . . . .	I.	Captain, Third Cavalry, U. S. A.
Fort Ethan Allen, Vt.		
ROBERT A. SHAILER . . . . .	I.	President of Shailer & Schniglaui Co., En- gineers and Contractors.
138 Jackson St., Chicago, Ill.		
C. EDWARD STAFFORD . . . .	III.	Manager, Open Hearth and Plate Mill, Illinois Steel Co.
South Chicago, Ill.		
SAMUEL E. TINKHAM . . . .	I.	Assistant Engineer, Engineering Depart- ment, City of Boston; Secretary, Boston Society of Civil Engineers.
City Hall, Boston.		
FRANK W. VERY . . . . .	V.	Acting Director, Ladd Observatory; Pro- fessor of Astronomy, Brown University.
Providence, R. I.		
WEBSTER WELLS . . . . .	I.	Professor of Mathematics, Mass. Institute of Technology.
Boston, Mass.		
RANDAL WHITTIER . . . . .	I.	(See Class of 1871.)
FRANCIS H. WILLIAMS, M.D. V.	V.	Physician.
505 Beacon St., Boston.		
LOUIS F. WOOD . . . . .	V.	Chemist and Manufacturer.
112 St. Botolph St., Boston.		

## 1874.

NAME AND ADDRESS.	COURSE.	OCCUPATION.
HERBERT BAKROWS . . . .	I.	
Reading, Mass.		
GEORGE H. BARRUS . . . .	II.	Expert and Consulting Steam Engineer.
95 Milk St., Boston.		
WILLIAM T. BLUNT . . . .	I.	U. S. Assistant Engineer (185 Euclid Ave., Toledo, Ohio).
GEORGE E. DOANE . . . .	I.	Of the Firm of J. & G. E. Doane, Hard- ware.
Middleboro, Mass.		
WILLIAM B. DOWSE . . . .	IV.	Of the Metropolitan Rubber Co.
Grand St. & East River, New York, N. Y.		
JOSEPH S. EMERSON . . . .	I.	Engineer and Surveyor.
Honolulu, Hawaiian Islands.		
ELLIOT HOLBROOK . . . .	I.	Superintendent, Louisville, Evansville & St. Louis R. R.; President, Pittsburgh & Mansfield R. R. (Pittsburgh, Pa.).
P. O. Box 563, Princeton, Ind.		
AECHIRAU HONGMA . . . .	I.	Civil Engineer, Imperial Government Rail- ways.
Tokio Tetsudo Cho, Tokio, Japan.		
CHARLES P. HOWARD . . . .	I.	Secretary, J. L. Howard & Co., Dealers in Railway and Car Builders' Supplies.
Hartford, Conn.		
FRANK H. JACKSON . . . .	III.	Mining and Hydraulic Engineer, Firm of J. P. Culver & Co.
145 So. Broadway, Los Angeles, Cal.		
HERBERT B. PERKINS . . . .	I.	Professor of Higher Mathematics and Me- chanical Drawing, Throop Polytechnic Institute.
Pasadena, Cal.		
FRANK H. POND . . . .	II.	Consulting Engineer; President, The Pond Machinery Co.
619 Wainwright Bldg., St. Louis, Mo.		
EDWARD S. SHAW . . . .	I.	Consulting Engineer.
12 Pearl St., Boston.		
FRANCIS H. SILSBEE . . . .	II.	Superintendent, Cotton Department, Pacific Mills.
Lawrence, Mass.		
STEPHEN H. WILDER, Sci. and Lit.		Attorney-at-law.
Blymyer Bldg., Cincinnati, Ohio.		

## 1875.

SAMUEL E. ALLEN . . . .	I.	Agent for the Nashawannuck Manufac- turing Co.
67 Chauncy St., Boston.		
JAMES L. ARNOTT . . . .	Sci. and Lit.	
Manchester, N. H.		
AMOS J. BOYDEN . . . .	IV.	Architect, of the Firm of Boyden & Taylor.
413 Walnut St., Philadelphia, Pa.		
MOSES D. BURNET . . . .	III.	Broker.
813 James St., Syracuse, N. Y.		

1875. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
HENRY K. BURRISON . . . Boston, Mass.	I.	Instructor in Mechanical Drawing, Mass. Institute of Technology.
CHRISTOPHER A. CHURCH . . . New Bedford, Mass.	I.	In Acushnet Mills.
FRANK S. DODGE . . . . . Honolulu, Hawaiian Islands.	I.	Civil Engineer and Surveyor in charge of City Work, Office of Government Survey.
EDGAR S. DORR . . . . . 28 Court Sq., Boston.	I.	Executive Engineer, Sewer Division, Street Department, City of Boston.
WILLIAM C. EDES . . . . . 321 Market St., San Francisco, Cal.	I.	Principal Assistant Engineer, San Francisco & San Joaquin Valley Ry.
CHARLES W. GOODALE . . . Butte City, Mont.	III.	Mine Superintendent, Colorado Smelting and Mining Co.
EDWARD A. W. HAMMATT . . . 29 Pemberton Sq., Boston.	I.	Civil and Hydraulic Engineer.
EDWARD A. HANDY . . . . . 57 Cornell St., Cleveland, Ohio.	I.	Chief Engineer, Lake Shore & Michigan Southern Ry.
THOMAS HIBBARD . . . . . South Boston, Mass.	II.	Treasurer, George Lawley & Son Corporation.
L. P. KINNICUTT, S.D. (Harv.) Worcester, Mass.	V.	Professor of Chemistry, Worcester Polytechnic Institute.
WILFRED LEWIS . . . . . 5901 Drexel Road, Philadelphia, Pa.	II.	Assistant Engineer, with William Sellers & Co.
SAMUEL J. MIXTER, M.D. 180 Marlborough St., Boston.	VIII.	Physician.
BENJAMIN A. OXNARD . . . Cypremont, La.	III.	Sugar Planter.
THOMAS D. PLIMPTON . . . Walpole, Mass.	II.	In Business.
WILLIAM A. PRENTISS, Sci. and Lit. Holyoke, Mass.		Of the Firm of George W. Prentiss & Co., Manufacturers of Wire.
FRANCIS T. SARGENT . . . Bucksport, Me.	II.	In Granite Business.
WELLAND F. SARGENT . . . 5316 Jefferson Ave., Chicago, Ill.	I.	Of Firm of Sargent & Bird, Manufacturers of Check Protectors.
WILLIAM H. SHOCKLEY . . . Bohemian Club, San Francisco, Cal.	III.	Travelling.
JAMES B. STANWOOD . . . . . Reading Road, Cincinnati, Ohio.	II.	Director, Cincinnati Technical School; of Firm of Houston, Stanwood, & Gamble, Engine Builders.
H. L. J. WARREN . . . . . 3 Pike's Peak Ave., Colorado Springs, Col.	III.	Mining Journalist.

1875.— *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
WILLIAM R. WEBSTER . . . 413 Walnut St., Philadelphia, Pa.	III.	Civil Engineer.

## 1876.

CHARLES F. ALLEN . . . South Duxbury, Mass.	III.	Mining Engineer and Metallurgist.
THOMAS ASPINWALL . . . 3 Hamilton Pl., Boston.	I.	Civil Engineer.
WILLIAM P. ATWOOD . . . 11 Harding St., Lowell, Mass.	V.	Chemist, Hamilton Prints Works.
THOMAS W. BALDWIN, A.B. Boothbay Harbor, Me.	I.	In Business.
WALTER B. BARROWS . . . Agricultural College, Ingham Co., Mich.	VII.	Professor of Zoölogy and Geology, Michi- gan Agricultural College.
AARON D. BLODGETT . . . 383 Federal St., Boston.	II.	Manufacturing Electrician.
JOSHUA B. F. BREED . . . 1348 Second St., Louisville, Ky.	I.	First Assistant Engineer, Bureau of En- gineering.
HARRY T. BUTTOLPH . . . 2411 Main St., Buffalo, N. Y.	I.	Assistant City Engineer, in charge of Pavement and Accessories.
FREDERICK K. COPELAND . . . 54 No. Clinton St., Chicago, Ill.	I.	President, Sullivan Machinery Co.
WILLIAM O. CROSBY . . . Boston, Mass.	VII.	Assistant Professor of Structural and Economic Geology, Mass. Institute of Technology.
WILLIS E. DAVIS . . . Mills Bldg., San Francisco, Cal.	Sci. and Lit.	Mining.
CHARLES R. FLETCHER . . . 82 Equitable Bldg., Boston.	V.	Consulting Chemist and Metallurgist.
JOHN R. FREEMAN . . . . . 4 Market Sq., Providence, R. I.	I.	President and Treasurer, R. I. Mutual Fire Insurance Co., Manufacturers' Mutual Fire Insurance Co. of R. I., Mechanics' Mutual Fire Insurance Co.
FRANCIS E. GALLOUPE . . . 210 Ocean St., Lynn, Mass.	II.	Mechanical Engineer (Technical Writing and Real Estate). (113 Devonshire St., Boston.)
JOHN B. HENCK, JR. . . . . 820 Dauphin St., Philadelphia, Pa.	VIII.	In Roadway Department, Union Traction Co.
FRANK W. HODGDON . . . . . 8 Wellington St., Arlington, Mass.	I.	Engineer, Harbor and Land Commissioners of Massachusetts. (65 Bowdoin St., Boston.)
SUMNER HOLLINGSWORTH . . . 44 Federal St., Boston.	II.	President, Hollingsworth & Whitney Co.
SILAS W. HOLMAN . . . . . Boston, Mass.	VIII.	Professor of Physics, Mass. Institute of Technology.

1876. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
ALFRED E. HUNT . . . Ferguson Bldg., Pittsburgh, Pa.	III.	President and General Manager, The Pittsburgh Reduction Co.; Vice-Chairman and Treasurer, The Pittsburgh Testing Laboratory (Limited); President, The Hunt Air Brake Co.
WILLIAM W. JACQUES, Ph.D., VIII. 104 Milk St., Boston.		Electrician of the American Bell Telephone Co.
SAMUEL JAMES, JR. . . . Sandy, Utah.	III.	Superintendent, Pennsylvania Smelting Co.
ALFRED C. KILHAM . . . . 1245 Washington Ave., Springfield, Mo.	II.	Storekeeper, St. Louis & San Francisco R. R.
J. AUSTIN KNAPP . . . . Abington, Mass.	II.	Manufacturer.
THEODORE J. LEWIS . . . . 212 No. Thirty-Fourth St., Philadelphia, Pa.	II.	Secretary and Assistant Treasurer, Standard Steel Works.
ALBERT H. LOW . . . . P. O. Box 1537, Denver, Colo.	V.	Chemist and Assayer.
CHARLES T. MAIN . . . . 53 State St., Boston.	II.	Of Dean & Main, Mill and Mechanical Engineers.
ARTHUR L. MILLS . . . . 2278 Ashland Ave., Toledo, Ohio.	I.	General Superintendent, Toledo, St. Louis, & Kansas City R. R.
WILLIAM E. NICKERSON . . . . 12 Pearl St., Boston.	V.	President, New England Weighing Machine Co.
DAVID W. PHIPPS . . . . 1607 First Ave., Seattle, Wash.	Phil.	Attorney-at-law.
CHARLES F. PRICHARD . . . . Lynn, Mass.	II.	General Superintendent, 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.
CHARLES A. SAWYER, Sci. and Lit. 107 Dearborn St., Chicago, Ill.		In Law and Real Estate Business.
THEODORE E. SCHWARZ . . . . 4 Bank Block, Denver, Colo.	III.	Mining Engineer.
JULIUS H. SUSMANN . . . . Montreal, Que.	III.	Mining Engineer for Canadian Pacific Ry.
WALTER D. TOWNSEND . . . . Chemulpo, Korea.	III.	Of the Firm of Morse, Townsend, & Co., Merchants.
CHARLES N. WAITE . . . . 203 Broadway, New York, N. Y.	V.	With American Viscose Co.
HENRY M. WAITT . . . . Chicago, Ill.	I.	Bridge Engineer, with Chicago, Burlington, & Quincy R. R.

1876. — *Continued.*

NAME AND ADDRESS.	COURSE	OCCUPATION.
HENRY B. WOOD . . . . . City Hall, Boston.	I.	Secretary and Executive Engineer, Street Department, City of Boston.

## 1877.

JOHN ALDEN . . . . . Lawrence, Mass.	V.	Chemist, Pacific Mills.
CHARLES S. BACHELDER . . . . . Watsonville, Cal.	V.	Chemist, Western Beet Sugar Co.
GEORGE BARTOL . . . . . Cleveland, Ohio.	III.	Superintendent, Otis Steel Co. (Limited).
J. WILLIAMS BEAL . . . . . 55 Kilby St., Boston.	IV.	Architect.
WILLIAM H. BEECHING . . . . . 19 John St., Boston.	II.	Cork Manufacturer.
G. WALTER CAPEN . . . . . 85 Water St., Boston.	IV.	Architect.
HENRY H. CARTER . . . . . 95 Milk St., Boston.	I.	Consulting Engineer.
WILLIAM E. CHAMBERLIN . . . . . 27 Clinton St., Cambridgeport, Mass.	IV.	Architect.
LINUS FAUNCE . . . . . Boston, Mass.	II.	Associate Professor of Drawing, Mass. Institute of Technology.
CHARLES H. FISHER . . . . . Ponkapog P. O., Canton, Mass.	II.	
MARTIN GAY . . . . . 2156 Lexington Ave., New York, N. Y.	I.	Assistant Engineer, Department of Public Works.
JOSEPH P. GRAY . . . . . 31 Milk St., Boston.	I.	Vice-President, Boston Manufacturers' Mutual Fire Insurance Co.
EDMUND GROVER . . . . . East Walpole, Mass.	I.	Civil Engineer and Landscape Gardener.
RICHARD A. HALE . . . . . Lawrence, Mass.	I.	Principal Assistant Engineer, Essex Water Power Co.
JOHN E. HARDMAN . . . . . 263 Fairmount St., Lowell, Mass.	III.	With Jersey Mills, Beaucé Co., Que.
HENRY D. HIBBARD . . . . . High Bridge, N. J.	III.	Consulting Engineer, Taylor Iron and Steel Co.
WALTER JENNEY . . . . . 55 G St., South Boston.	III.	Superintendent, Petroleum Refinery, Jenney Manufacturing Co.
GEORGE W. KITTREDGE . . . . . Cincinnati, Ohio.	I.	Chief Engineer, Cleveland, Cincinnati, Chicago, & St. Louis Ry.
CHARLES F. LAWTON . . . . . New Bedford, Mass.	I.	Superintendent of Public Works.
BENJAMIN C. MUDGE . . . . . 510 Summer St., Lynn, Mass.	I.	Treasurer of the Superior Fast Black and Chemical Co. (Boston).

1877. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
CECIL H. PEABODY . . . . Boston, Mass.	II.	Professor of Marine Engineering and Naval Architecture, Mass. Institute of Technology.
ARTHUR L. PLIMPTON . . . 81 Milk St., Boston.	I.	Chief Engineer, Civil Engineering Department, West End Street Ry. Co.
HARRY C. SOUTHWORTH . . West Stoughton, Mass.	III.	Mining Engineer.
THOMAS F. STIMPSON . . . Providence, R. I.	III.	Overseer, Printing Department, Silver Spring Bleaching and Dyeing Co.
GEORGE F. SWAIN . . . . Boston, Mass.	I.	Hayward Professor of Civil Engineering, Mass. Institute of Technology; Engineer Mass. R. R. Commission.
FREDEKICK W. WOOD . . . Sparrow's Point, Md.	III.	President, Maryland Steel Co.

## 1878.

WILLIAM B. ALLBRIGHT . . Union Stock Yards, Chicago, Ill.	V.	Manager, Swift & Co., Lard Refinery.
CHARLES M. BAKER . . . . Ames Bldg., Boston.	IV.	With Chase & Barstow, Stock Brokers.
TAKUMA DAN . . . . . Surugacho Nihonbashi-Ku, Tokio, Japan.	III.	Managing Director, Mitsui Mining Co.
CHARLES S. EATON . . . . 215 Washington St., Boston.	IV.	In Business.
ALFRED S. HIGGINS . . . . 142 Atlantic Ave., Boston.	IV.	With R. R. Higgins & Co.
JULIAN A. KEBLER . . . . 701 Boston Bldg., Denver, Colo.	I.	Second Vice-President, The Colorado Fuel and Iron Co.
EVERELL J. NICHOLS . . . . 125 Ferry St., Everett, Mass.	I.	Civil Engineer.
FREDERICK H. PRENTISS . . P. O. Box 1132, Chicago, Ill.	II.	President, The Buckeye Electric Co.
JAMES RITCHIE . . . . . Hickox Bldg., Cleveland, Ohio.	I.	Civil and Consulting Engineer; Inspector of Structural Material.
JAMES W. ROLLINS, JR. . . . West Roxbury, Mass.	I.	Assistant Engineer of Construction, New York, New Haven, & Hartford R. R. (Brockton, Mass.)
C. D. SAWIN, M.D., Sci. and Lit. 349 Main St. Charlestown, Mass.		Physician.
PETER SCHWAMB . . . . . Boston, Mass.	II.	Professor of Mechanism, Mass. Institute of Technology.
FREDERIC P. SPALDING . . . 1016 Middlesex St., Lowell, Mass.	I.	Assistant Engineer, Engineering Department, City of Boston.
ISAAC M. STORY . . . . . Somerville, Mass.	I.	Assistant Engineer, New England R. R.

1878. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
LINWOOD O. TOWNE . . . Haverhill, Mass.	III.	Sub-Master, Haverhill High School.
EMILE F. WILLIAMS . . . 81 Franklin St., Boston.	I.	Of the Firm of Arthur Williams, Jr., & Co., Importers of East India and China Goods.
JAMES G. WOOLWORTH . . . 298 Fountain St., Providence, R. I.	V.	Superintendent, John D. Lewis Dyewood Extract Manufactory.

## 1879.

WALTER S. ALLEN . . . 34 So. Sixth St., New Bedford, Mass.	V.	
SAMUEL T. BRALEY . . . 41 Park St., Rutland, Vt.	II.	Mechanical Engineer.
JOHN W. CABOT . . . Capital Hotel, Johnstown, Pa.	III.	Assistant Superintendent of Blast Furnaces, Cambria Iron Co.
HARRY H. CAMPBELL . . . Steelton, Pa.	III.	Superintendent, Pennsylvania Steel Co.
FREDERICK S. COFFIN . . . 152 Congress St., Boston.	III.	Of the Firm of Stoddard, Haserick, Rich- ards, & Co., Importers and Commission Merchants.
W. OTIS DUNBAR . . . 1218 Thirteenth St., Altoona, Pa.	II.	In charge of Test Department, Pennsylvania R. R.
GEORGE W. FABENS . . . Ottumwa, Iowa.	I.	Division Roadmaster, Chicago, Burlington, & Quincy R. R.
CHARLES S. GOODING . . . 28 School St., Boston.	II.	Mechanical Engineer and Draughtsman.
RAPHAEL M. HOSEA . . . 817 Boston Bldg., Denver, Colo.	I.	Chief Engineer, The Colorado Fuel and Iron Co.
HORACE J. HOWE . . . 20 Beacon St., Boston.	I.	Assistant Engineer, Boston Transit Com- mission.
FREDERICK B. KNAPP . . . Duxbury, Mass.	I.	Principal, Powder Point School.
FREDERIC H. LANE . . . 49 Leonard St., New York, N. Y.	II.	With the Allen-Lane Co., Commission Merchants.
FREDERIC R. LORING . . . Pottstown, Pa.	VII.	Teacher, Pottstown High School.
WILLIAM W. MACFARLANE . . . 613 E. 14th St., Chester, Pa.	V.	Superintendent, Sharpless Dyewood Ex- tract Co.
ARTHUR H. METCALF . . . Pawtucket, R. I.	II.	Mechanical Engineer.
EDWIN C. MILLER . . . Wakefield, Mass.	II.	Assistant Superintendent, Henry F. Miller & Sons' Piano Co. (88 Boylston St., Boston).
WILLIAM H. PICKERING . . . Cambridge, Mass.	VIII.	Astronomer, Harvard College Observatory.
GEORGE F. RIGGS . . . Glenwood, Md.	I.	
FRANK G. STANTIAL . . . Everett, Mass.	V.	Superintendent, Cochrane Chemical Co.



1879. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
WILLIAM S. STEARNS . . . Cincinnati, Ohio.	I.	Superintendent, Stearns & Foster Co.'s Cotton Factory.
ARTHUR M. WAITT . . . Cleveland, Ohio.	II.	General Master Car Builder, Lake Shore & Michigan Southern Ry.

## 1880.

GEORGE H. BARTON . . . Boston, Mass.	III.	Assistant Professor of Geology, Mass. Institute of Technology.
CHARLES H. BROWN . . . Willington, Conn.	I.	Clergyman.
EDWIN E. CHASE . . . Mining Exchange Bldg., Denver, Colo.	I.	Mining Engineer and United States Deputy Mineral Surveyor.
FREDERICK W. CLARK . . . 7540 Lake Ave., Chicago, Ill.	III.	President, Jonathan Clark & Sons' Co., General Contractors.
GEORGE W. HAMILTON . . . 28 Court Sq., Boston.	I.	District Engineer, Sewer Division, Street Department, City of Boston.
LORING R. MILLEN . . . 70 Beaver St., New York, N. Y.	III.	Wholesale Lumber Merchant.
WILLIAM T. MILLER . . . 88 Boylston St., Boston.	Elective.	Salesman, with Henry F. Miller & Sons' Piano Co.

## 1881.

IRA ABBOTT . . . 150 Broadway, New York, N. Y.	I.	Civil Engineer.
JOHN H. ALLEN . . . Perth Amboy, N. J.	III.	Superintendent, The Guggenheim Smelting Co.
AMOS BINNEY, A.B. . . . 53 State St., Boston.	V.	Real Estate Agent.
DAVID S. BISSELL . . . Pittsburgh, Pa.	III.	President, Duquesne Forge Co., Iron and Steel Forgings; also of Chase & Bissell, Chemists (Versailles, Pa.).
FRANK H. BRIGGS . . . 2 High St., Boston.	IX.	Commission Merchant, W. L. Montgomery & Co.
FRANK E. CAME . . . 17 Place d'Armes Hill, Montreal, Que.	I.	President, Canadian Bridge and Iron Co.; Canadian Manager, Q. & C. Co., National Hollow Brake Beam Co.
FRANK D. CHASE . . . Versailles, Pa.	III.	Chemist.
BENJAMIN G. COLLINS . . . Edgartown, Mass.	II.	Surveyor.
HARRY H. CUTLER . . . 76 W. Jackson St., Chicago, Ill.	II.	Treasurer, The Cutler-Hammer Manufac- turing Co.
F. GRAEF DARLINGTON . . . 676 No. Delaware St., Indianapolis, Ind.	IX.	Superintendent, Indianapolis Division, Pittsburgh, Cincinnati, Chicago, & St. Louis Ry.

**1881.** — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
JOHN DUFF, M.D. . . . . 5 Dexter Row, Charlestown, Mass.	V.	Physician.
DAVID S. GODDARD . . . . 49 Gardner St., Chelsea, Mass.	III.	
WALTER J. KOEHLER . . . . Broken Hill, N. S. W., Australia.	V.	Chief Metallurgist, Broken Hill Proprietary Co.
EDWIN J. LEWIS, JR. . . . 9 Park St., Boston.	IV.	Architect.
WILLIAM B. LINDSAY, A.B. . . . Carlisle, Pa.	V.	Professor of Chemistry, Dickinson College.
JAMES LUND . . . . . Everett, Mass.	V.	Superintendent, West Department, Cochran Chemical Co.
GEORGE A. MOWER . . . . 75 Queen Victoria St., London, Eng.	II.	General Manager, Sturtevant Engineering Co.
WEBSTER NORRIS . . . . . Chelsea, Mass.	III.	Chemist, Revere Rubber Co.
EVELYN W. ORDWAY . . . . New Orleans, La.	V.	Professor of Chemistry, Newcomb College, Tulane University.
THEODORE PARKER . . . . Atlantic, Mass.	I.	In City Engineer's Office, Park Department, City of Boston.
NATHANIEL W. SHED . . . . Burden, N. Y.	V.	Chemist for Hudson River Ore and Iron Co.
WILLIAM R. SNEAD . . . . 318 W. Chestnut St., Louisville, Ky.	IV.	General Manager, The Snead & Co. Iron Works.
HAROLD E. STEARNS . . . . Montreal, Que.	II.	Superintendent and Treasurer, Dominion Wadding Co.
EDWARD R. WARREN . . . . 319 No. Webber St., Colorado Springs, Colo.	VII.	Civil Engineer.
CHARLES M. WILKES . . . . 1142 The Rookery, Chicago, Ill.	IV.	Sanitary Engineer.
ARTHUR WINSLOW . . . . Kansas City, Mo.	III.	Manager Mining Department, Missouri, Kansas, & Texas Trust Co.

**1882.**

CLARA B. AMES . . . . . Northampton, Mass.	V.	Teacher in Mary A. Burnham Classical School.
THOMAS B. CARSON . . . . 709 Perry St., Davenport, Iowa.	II.	Secretary, Bettendorf Metal Wheel Co. (Davenport, Iowa, & Springfield, Ohio).
CARRIE RICE CLARK . . . . Green Mountain Falls, Colo.	V.	

1882.— *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
EDWARD F. ELY, A.B. . . . 32 Westminster St., Providence, R. I.	IV.	Architect, Hoppin & Ely.
GEORGE FAUNCE, A.B. . . . Carnegie, Pa.	III.	Superintendent, Pennsylvania Lead Co.
CHARLES A. FRENCH, M.D. 47 Winter St., Boston.	III.	Optician.
HOWARD V. FROST, Ph.D. . . Transit House, Union Stock Yards, Chicago, Ill.	V.	Chemist, Anglo-American Provision Co., and Fowler Brothers, Limited.
EDW. G. GARDINER, Ph.D. VII. 131 Mt. Vernon St., Boston.		
FRANCIS P. HALL . . . . .	V.	Stock-raising. Emporia, Kans.
GEORGE L. HEINS . . . . .	IV.	Architect, of Firm of Heins & La Farge. Temple Court, New York, N. Y.
CHARLES D. JENKINS . . . .	V.	State Inspector of Gas and Gas Meters. 32 Hawley St., Boston.
JAMES W. JOHNSON . . . . .	I.	City Engineer. Riverside, Cal.
JOHN F. LOW . . . . .	V.	Treasurer, Low Art Tile Co. Chelsea, Mass.
HARRY G. MANNING . . . . .	II.	Mechanical Engineer, Simonds Manufac- turing Co. 119 Summer St., Fitchburg, Mass.
GEORGE W. MANSFIELD . . .	III.	Secretary and Treasurer, Norwalk Tram- way Co. So. Norwalk, Conn.
FRANK C. MORRISON . . . . .	I.	Civil and Bridge Engineer. San Francisco, Cal.
JAMES P. MUNROE . . . . .	III.	Of the Firm of Jas. S. Munroe & Co. Paper Manufacturers. 179 Devonshire St., Boston.
HENRY F. ROSS . . . . .	III.	With The Boston Thread and Twine Co. 178 Devonshire St., Boston.
JOHN H. ROSS . . . . .	Sci. and Lit.	President, The Boston Thread and Twine Co. 178 Devonshire St., Boston.
GRENVILLE T. SNELLING . . .	IV.	Of Firm of Snelling & Potter, Architects ; Instructor in Architectural Engineering, School of Mines, Columbia University. 111 Fifth Ave., New York, N. Y.
WALTER B. SNOW . . . . .	II.	Chief Draughtsman, B. F. Sturtevant Co (Jamaica Plain, Mass.). Watertown, Mass.

## 1883.

HERBERT T. BARDWELL . . . .	I.	Civil Engineer. 11 Woodside Ave., Springfield, Mass.
-----------------------------	----	--

1883. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
GEORGE H. BRYANT . . . 15 Summer St., Newport, R. I.	II.	Principal, Townsend Industrial School.
HARVEY S. CHASE . . . 610 Sears Bldg., Boston (and 39 Cortlandt St., New York, N. Y.).	II.	Electrical and Mechanical Engineer, Trustee The Watauga Association.
FRANK E. DAVIS . . . Worcester, Mass.	II.	With Washburn & Moen Manufacturing Co.
JOHN G. EPPENDORFF . . . 627 Main St., Buffalo, N. Y.	IV.	Decorator.
GEORGE J. FORAN . . . 356 Harvard St., Cambridge, Mass.	II.	With The Geo. F. Blake Manufacturing Co.
WILLIAM B. FULLER . . . 3 Mt. Vernon St., Boston.	I.	Assistant Engineer, Metropolitan Water Board.
HORACE B. GALE . . . 610 Sears Bldg., Boston.	II.	With American Electric Heating Corpora- tion; Consulting Mechanical and Elec- trical Engineer.
GEORGE H. GUSTIN . . . 112 Sayre St., Elizabeth, N. J.	III.	With Bowker Fertilizer Co.
FREDERIC O. HARRIMAN . . . Jaltipan, Mexico.	I.	Civil Engineer and Contractor; Land Agent.
JAMES H. HUTCHINGS . . . 40 State St., Boston.	II.	In Real Estate Business.
H. WARD LEONARD . . . Hoboken, N. J.	III.	President, Ward Leonard Electric Co., and Carpenter Enamel Rheostat Co.
HARVEY M. MANSFIELD . . . Fairfield, Me.	III.	Superintendent, Somerset Fibre Co.
ROBERT W. SCOTT . . . 917 Arch St., Philadelphia, Pa.	II.	Manager, Philadelphia Heliographic Co.
GEORGE A. SMITH . . . Chelsea, Mass.	V.	Superintendent, Thos. Strahan & Co. Branch of the National Wall Paper Co.
FRANK TENNEY . . . Steelton, Pa.	III.	Assistant Superintendent, The Pennsyl- vania Steel Co.
CHARLES H. TOMPKINS, JR. . . . 26 Cortlandt St., New York, N. Y.	III.	Civil Engineer; President, American Dia- mond Rock Drill Co.
GEORGE R. UNDERWOOD . . . Peabody, Mass.	V.	Superintendent, Peabody Factory of Ameri- can Glue Co.
DAVID WESSON . . . Cortland, N. Y.	V.	Bicycle Manufacturer; President and Treas- urer, The Wesson Manufacturing Co.

## 1884.

CHARLES B. APPLETON . . . Aspinwall Ave., Brookline, Mass.	II.	
HENRY F. BALDWIN . . . Jersey City, N. J.	II.	Engineer, Maintenance of Way, Erie R. R.

1884. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
FRED L. BARDWELL, B.S. . . . Boston, Mass.	V.	Assistant Professor of General Chemistry, Mass. Institute of Technology.
T. HARRIS BARTLETT . . . . Portland, Oreg.	III.	Attorney-at-law.
HENRY A. BOARDMAN . . . . Jewett City, Conn.	V.	With The Aspinook Co.
CHARLES C. BOTHFELD . . . . Home Bank Bldg., Detroit, Mich.	I.	Consulting Engineer on Iron and Steel Structures; Resident Manager, Pitts- burgh Testing Laboratory.
W. FRANK CARR, B.S. . . . . Chicago, Ill.	I.	Engineer, Track and Electric Department, West Chicago Street Ry.
CHRISTOPHER J. CARVEN . . . 1604 Dorchester Ave., Dorchester, Mass.	I.	Assistant Engineer, City Engineer's Office, City of Boston.
ROSCOE L. CHASE . . . . . North Adams, Mass.	V.	Chemist, Arnold Print Works.
ALFRED O. DOANE . . . . . 3 Mt. Vernon St., Boston.	III.	Assistant Engineer, Metropolitan Water Board.
ALFRED L. FITCH . . . . . 135 Scoville Ave., Oak Park, Ill.	II.	
GEORGE L. R. FRENCH . . . . Boston, Mass.	I.	Roadmaster, Eastern Division, Boston & Maine R. R.
AUGUSTUS H. GILL, Ph.D. . . Boston, Mass.	V.	Assistant Professor of Gas Analysis, Mass. Institute of Technology.
FRANK M. HAINES . . . . . 37 East Ave., Elyria, Ohio.	III.	With the Johnson Steel Co. (Lorain, Ohio).
GEORGE H. HEYWOOD . . . . Gardner, Mass.	III.	Of the Firm of Heywood Bros. & Co.
JAMES G. HOLDER, Ph.G. . . . 119 Broad St., Lynn, Mass.	V.	Apothecary.
G. FREDERICK KNAPP . . . . Harrison Bldg., Philadelphia, Pa.	V.	With Oglebay, Norton & Co., Iron Ores, (Cleveland, Ohio).
D. A. LYLE, Capt., U. S. A. . . P. O. Box 1606, Philadelphia, Pa.	III.	Inspector of Ordnance, U. S. A.
PHILIP S. MORSE, A.B. . . . . 505 McComick Block, Salt Lake City, Utah.	III.	Mining Engineer.
CHARLES O. PRESCOTT . . . . Milton, Mass.	V.	Teacher of Natural Science, Milton Academy.
WILLIAM L. PUFFER . . . . . Boston, Mass.	III.	Assistant Professor of Electrical Engineer- ing, Mass. Institute of Technology.
ARTHUR J. PURINTON . . . . Stamford, Conn.	II.	Superintendent, Stamford Gas and Elec- tric Co.

1884. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
WILLIAM J. RICH . . . . 208 Eleventh St., N. E., Washington, D. C.	III.	First Assistant Examiner, U. S. Patent Office.
FRANKLIN B. RICHARDS . . Cleveland, Ohio.	III.	With M. A. Hanna & Co.
C. SNELLING ROBINSON . . 615 Broadway, Pueblo, Colo.	III.	Assistant General Superintendent, Colorado Fuel and Iron Co.
THEODORE W. ROBINSON . . Pueblo, Colo.	III.	General Superintendent, Colorado Fuel and Iron Co.
A. LAWRENCE ROTCH, A.M. 53 State St., Boston.	II.	Director of Blue Hill Meteorological Observatory (Readville, Mass.).
J. PETERSON RYDER . . . . Philadelphia, Pa.	V.	Director of Physical Training, Drexel Institute.
ALFRED STEBBINS, JR., . . Newton Highlands, Mass.	III.	Civil Engineer.
ELLIOT T. STURGIS . . . . 125 Milk St., Boston.	III.	In Superintendent's Office, Boston Division, New England Telephone and Telegraph Co.
ALICE BROWN TYLER . . . . Newton Centre, Mass.	V.	
HARRY W. TYLER, Ph.D. . . Boston, Mass.	V.	Professor of Mathematics, and Secretary, Mass. Institute of Technology.
NAHUM WARD . . . . . 49 An der Alster, Hamburg, Germany.	V.	Student.
WILLIAM M. WHITNEY . . . Winchendon, Mass.	II.	With Baxter D. Whitney, Manufacturer of Wood-working Machinery.
FRANCIS C. WILLIAMS, JR. Sheridan, Wyo.	I.	Civil Engineer.

## 1885.

CHARLES R. ALLEN . . . . New Bedford, Mass.	V.	Science Teacher, New Bedford High School.
DAVID BAKER . . . . . Sparrow's Point, Md.	III.	Superintendent, Blast Furnace Department, Maryland Steel Co.
EDWARD R. BENTON, Ph.D. 27 Doane St., Boston.	IV.	Architect.
HEYWOOD COCHRAN . . . . Johnstown, Pa.	II.	Treasurer, The Cochran Co.
EDWARD H. DEWSON, JR. . . Buffalo, N. Y.	II.	Mechanical Engineer, Pratt & Letchworth Co.
FREDERICK FOX, S.M., Ph.D. 77 State St., Portland, Me.	V.	Analytical Chemist.
THOMAS W. FRY . . . . . Claremont, N. H.	II.	Secretary and Superintendent, Sullivan Machinery Co.
ROBERT R. GOODRICH . . . Chihuahua, Mexico.	III.	Chemist with Chihuahua Mining Co.

1885. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
WALTER K. HARRINGTON . . . P. O. Box 232, Andover, N. J.	I.	Vice-President, Standard Musical String Co.
ELEAZER B. HOMER . . . . .	IV.	Associate Professor of Architecture, Mass. Institute of Technology.
TRACY LYON . . . . .	II.	Master Mechanic, Chicago & Great Western Ry. Metropolitan Opera House Bldg., St. Paul, Minn.
HUGH MACRAE . . . . .	III.	President, The Wilmington Cotton Mills. Wilmington, N. C.
HENRY MARTIN . . . . .	V.	With Richards Paper Co. South Gardiner, Me.
ALLYNE L. MERRILL . . . . .	II.	Assistant Professor of Mechanism, Mass. Institute of Technology. Boston, Mass.
EVERETT MORSS . . . . .	III.	With Morss & Whyte; Vice-President, Eastern Expanded Metal Co.; Vice- President, Simplex Electrical Co. 79 Cornhill, Boston.
FREDERICK H. NEWELL . . . . .	III.	Chief Hydrographer, U. S. Geological Survey. Washington, D. C.
JOSEPH E. NUTE . . . . .	I.	Superintendent, Fall River Gas Works Co. 14 Bedford St., Fall River, Mass.
MARCELLA I. O'GRADY . . . . .	IX.	Professor of Biology, Vassar College. (Travelling.) Poughkeepsie, N. Y.
FRANK A. PICKERNELL . . . . .	VI.	Chief Engineer, American Telephone and Telegraph Co. 153 Cedar St., New York, N. Y.
RICHARD H. PIERCE, A.B. . . . .	VI.	Of the Firm of Pierce & Richardson, Elec- trical and Mechanical Engineers. Manhattan Bldg., Chicago, Ill.
NEWBERT M. RANDALL . . . . .	III.	Chief Chemist, Maryland Steel Co. Sparrow's Point, Md.
OTIS T. STANTIAL . . . . .	III.	Superintendent, Illinois Malleable Iron Co. 515 Diversey Ave., Chicago, Ill.
HENRY P. TALBOT, Ph.D. . . . .	V.	Associate Professor of Analytical Chemis- try, Mass. Institute of Technology. Boston, Mass.
GEORGE P. VANIER . . . . .	III.	Chemist, Pennsylvania Steel Co. Steelton, Pa.
ERASTUS WORTHINGTON, JR. . . . .	I.	Civil Engineer. 53 State St., Boston.

## 1886.

GEORGE P. ABORN . . . . .	II.	Assistant Constructing Engineer, Knowles Steam Pump Works Warren, Mass.
ARTHUR C. ANTHONY . . . . .	III.	Special Agent, London Assurance Corpo- ration. 44 Pine St., New York, N. Y.
DANA P. BARTLETT . . . . .	VI.	Assistant Professor of Mathematics, Mass. Institute of Technology. Boston, Mass.

1886. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
BIRNEY C. BATCHELLER . . . 906 Walnut St., Philadelphia, Pa.	II.	Engineer, Pneumatic Transit Co.
WILLIAM L. BRAINERD . . . 153 La Salle St., Chicago, Ill.	IV.	Of Firm of Brainerd & Holsman, Architects.
JOHN K. BURGESS . . . . . Dedham, Mass.	II.	With the New England Sulphite Digester Co. (220 Devonshire St., Boston).
CHARLES L. BURLINGHAM . . . 207 So. Canal St., Chicago, Ill.	III.	With McDermid Manufacturing Co.
WM. H. CHADBOURN, JR. . . . Newbern, N. C.	III.	United States Assistant Engineer, River and Harbor Improvements.
WILLIAM L. CHURCH . . . . . 462 Jefferson St., Milwaukee, Wis.	VI.	With Milwaukee Electric Railway and Light Co.
HARRY E. CLIFFORD . . . . . Boston, Mass.	VI.	Assistant Professor of Theoretical Physics, Mass. Institute of Technology.
LOUIS R. COBB . . . . . Town Hall, Brookline, Mass.	I.	Assistant in Office of Town Engineer.
LOUIS F. CUTTER . . . . . 91 Church St., Winchester, Mass.	I.	Assistant Engineer, Charlestown Bridge.
CHARLES C. DOE . . . . . South Newbury, Vt.	VII.	Proprietor, Mt. Hag Stock Farm.
ORRIN S. DOOLITTLE . . . . . 130 No. Fifth St., Reading, Pa.	V.	Chemist and General Storekeeper, Philadelphia & Reading R. R.
JAMES C. DUFF . . . . . Milwaukee, Wis.	V.	Superintendent, Lard, Oleo, and Oil Departments, Plankinton Packing Co.
GEORGE W. FARMER . . . . . 1005 Taylor St., Topeka, Kans.	II.	Engineer of Tests, Atchison, Topeka, & Santa Fé Ry.
FRED E. FOSS, A.M. . . . . State College, Pa.	I.	Professor of Civil Engineering, Pennsylvania State College.
THEODORE R. FOSTER . . . . . Burnham Station, Denver, Colo.	II.	Mechanical Engineer, Denver & Rio Grande R. R.
ALEXANDER S. GARFIELD . . . 27 Rue de Londres, Paris, France.	II.	Chief Engineer, Power and Mining Department, Compagnie Française Thomson-Houston.
D. LEWIS K. HATHAWAY . . . Warren, Mass.	II.	With Knowles Steam Pump Works.
EDWARD E. HIGGINS . . . . . 26 Cortlandt St., New York, N. Y.	VI.	Editor Street Railway Journal.
WILLIAM J. HOPKINS . . . . . Philadelphia, Pa.	VI.	Professor of Physics, Drexel Institute.
WALTER RENTON INGALLS . . . 229 Ocean St., Lynn, Mass.	III.	Mining Engineer and Metallurgist. (12 Old Slip, New York, N. Y.).
WILLIAM F. JORDAN . . . . . Rochester, N. Y.	I.	Assistant Engineer, Buffalo, Rochester, & Pittsburgh R. R.



1886. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
C. BELLE KENNEY . . . . Wollaston, Mass.	V.	Teacher of Science, Quincy Mansion School.
ALBERT E. LEACH . . . . State House, Boston.	II.	Assistant Analyst, Food and Drug Department, Mass. State Board of Health.
FRANK L. LOCKE . . . . Malden, Mass.	I.	Assistant Superintendent, Boston Rubber Shoe Co.
WILSON H. LOW . . . . 253 Bennett Ave., Cripple Creek, Colo.	V.	Assayer and Chemist.
ELGOOD C. LUFKIN . . . . 102 Anderson Pl., Buffalo, N. Y.	II.	Manager, Snow Steam Pump Works.
JAMES P. LYNDE . . . . Palmer, Mass.	IX.	Druggist.
ALEX. RICE MCKIM . . . . 106 E. Twenty-third St., New York, N. Y.	I.	Architectural Engineer.
HARRY B. MERRIAM . . . . 713 Wabash Ave., Kansas City, Mo.	I.	Roadmaster, Kansas City, Fort Smith, & Memphis R. R.
HENRY P. MERRIAM . . . . 100 Broadway, New York, N. Y.	VI.	Chief Engineer, The Standard Air Brake Co.
EDWARD F. MILLER . . . . Boston, Mass.	II.	Assistant Professor of Steam Engineering, Mass. Institute of Technology.
EDGAR H. MUMFORD . . . . Elizabeth, N. J.	II.	Secretary and Treasurer, The Tabor Manufacturing Co.
ARTHUR A. NOYES, S.M., Ph.D. Boston, Mass.	V.	Assistant Professor of Organic Chemistry, Mass. Institute of Technology.
EDWARD L. PIERCE, JR. . . . Syracuse, N. Y.	II.	With Solvay Process Co.
CHARLES F. RICHARDSON . . . . 53 State St., Boston.	II.	Lawyer.
ARTHUR G. ROEBINS . . . . Boston, Mass.	I.	Assistant Professor of Highway Engineering, Mass. Institute of Technology.
L. KIMBALL RUSSELL . . . . Boston, Mass.	V.	Instructor in General Chemistry, Mass. Institute of Technology.
J. FRANK SEAVEY . . . . 16 Trenton St., Charlestown, Mass.	II.	With George S. Rice and George E. Evans, Civil and Hydraulic Engineers (95 Milk St., Boston).
WILLIAM E. SHEPARD . . . . 971 Steinway Ave., Long Island City, N. Y.	VI.	Electrical Engineer.
JAMES E. SIMPSON . . . . 163 Haverhill St., Lawrence, Mass.	III.	With J. R. Simpson & Co.
THEODORE STERBINS . . . . Schenectady, N. Y.	VI.	Engineer, Committee on Local Companies, General Electric Co.

1886. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
AUGUSTUS B. SFOUGHTON 419 Chestnut St., Philadelphia, Pa.	II.	Attorney-at-law, Patent Business.
WILLIAM M. TAYLOR . . .	II.	Vice-President and Treasurer, Chandler & Taylor Co.
CHARLES D. TURNBULL . . .	II.	Manager of an Estate (Providence, R. I.). The Ludlow, Boston.
DAVID VAN ALSTINE . . .	II.	Vice President, The Snead Van Alstine Meldrum Co., Iron Works. 710 Fourteenth St., Louisville, Ky.
MAURICE A. VIELÉ, B.S. . .	II.	Assistant Engineer, Croton Aqueduct Com- mission. Katonah, N. Y.
C. MORRIS WILDER . . .	VI.	Representative of The Sargent Co. of Chi- cago, Brake Shoes and Steel Founders. Neave Bldg., Cincinnati, Ohio.
ELWOOD J. WILSON . . .	III.	Denver, Colo.
CHARLES H. WOODBURY . . .	II.	Artist. 192 Boylston St., Boston, Mass.
VERNOR F. WOODCESTER . . .	II.	Draughtsman, Howe Scale Co. 40 Pine St., Rutland, Vt.
FRED R. YOUNG . . .	III.	Jobber and Importer. 220 Devonshire St., Boston.

## 1887.

GEORGE A. ARMINGTON . . .	II.	Superintendent, Phoenix Iron Works Co. Wason St., Cleveland, Ohio.
SIDNEY R. BARTLETT, D.M.D., VII.		Of Firm of Bartlett & Co., Mines & Mining Stocks. Exchange Bank Block, Colorado Springs, Colo.
CHARLES A. BARTON . . .	II.	With Canadian General Electric Co. Peterboro', Ont.
WILLIAM B. BLAKE . . .	I.	Assistant Engineer, Maintenance of Way, Louisville Division, Pittsburgh, Cincin- nati, Chicago, & St. Louis Ry. Fourteenth & Main Sts., Louisville, Ky.
WALTER C. BRACE . . .	III.	Metallurgist and Mining Engineer. 710 Seventeenth St., Denver, Colo.
DWIGHT BRAINERD . . .	IX.	Treasurer, Hamilton Powder Co. 103 St. François Xavier, Montreal, Que.
HENRY B. BRAINERD . . .	IX.	Treasurer, Dominion Cartridge Co. (Limited). 103 St. François Xavier, Montreal, Que.
HENRY F. BRYANT . . .	I.	Of Firm of French & Bryant, Civil Engi- neers. Brookline, Mass.

1887. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
FRANK GELETT BURGESS . . . . 24 Montgomery St., San Francisco, Cal.	I.	Editor of "The Lark"; with Gelett Burgess & Porter Garnet, Publishers.
JULIAN A. CAMERON . . . . Forge Village, Mass.	II.	With Abbot Worsted Mills.
FRANK D. CARNEY . . . . Steelton, Pa.	III.	With Pennsylvania Steel Co.
WINTHROP COLE . . . . Hampton, Va.	II.	With the Superintending Constructor, U. S. N., at Newport News, Va.
HENRY J. CONANT . . . . 53 State St., Boston.	II.	Engineer, Westinghouse, Church, Kerr, & Co. (Incorporated), Engineers.
HELEN COOLEY, M.D. . . . 110 W. Eighty-fourth St., New York, N. Y.	V.	Physician; Assistant Surgeon, N. Y. Ophthalmic Hospital.
RALPH E. CURTIS . . . . 203 Broadway, New York, N. Y.	II.	
WILLIAM C. CUSHING, M.A. . . . 2 Carson St., Pittsburgh, Pa.	I.	Engineer of Maintenance of Way, Pittsburgh Division, Pennsylvania Lines West of Pittsburgh.
SARAH L. DAY, A.M. . . . 280 Newbury St., Boston.	V.	Water Analyst, State Board of Health.
WALTER C. FISH . . . . King's Beach Terrace, Lynn, Mass.	VI.	General Manager, Lynn Works, General Electric Co.
JOHN M. FOX . . . . 66 Union St., Portland, Me.	VI.	Electrical Engineer and Contractor.
JOSEPH B. GAY . . . . 12 Pearl St., Boston.	IV.	Of Firm of Gay & Proctor, Architects.
WALTER H. GLEASON . . . . 53 State St., Boston.	V.	In Business; Real Estate and Mortgages.
WILLIAM S. HADAWAY, JR. . . . 101 W. Ninetieth St., New York, N.Y.	VIII.	Consulting and Constructing Electric Heating Engineer.
WILLIAM O. HILDRETH . . . . Lawrence, Mass.	II.	Mechanical Engineer, Stanley Manufacturing Co.
JAMES C. HOBART . . . . 610 Baymiller St., Cincinnati, Ohio.	II.	Secretary and Manager, Triumph Electric Co. and Triumph Ice Machine Co.
OREN S. HUSSEY . . . . Nashua, N. H.	II.	Of Firm of Gregg & Son, Manufacturers of Doors, Windows, Blinds, etc.
EDWARD A. JONES . . . . Pittsfield, Mass.	II.	With E. D. Jones & Sons' Co., Architects and Manufacturers of Paper Machinery
CHARLES B. KENDALL . . . . Passaic, N. J.	V.	Superintendent, Passaic Print Works.
WILLIAM D. LIVERMORE . . . . Lawrence, Mass.	V.	Chemist, Washington Mills.

1887. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
PHILIP A. MOSMAN . . . . Pueblo, Colo.	III.	With Colorado Smelting Co.
SAMUEL P. MULLIKEN, Ph.D. Boston, Mass.	V.	Instructor in Organic Chemistry, Mass. Institute of Technology.
GEORGE L. NORRIS . . . . 71 Water St., Laconia, N. H.	III.	Superintendent, Malleable Iron Depart- ment, Laconia Car Co.
GEO. W. PATTERSON, JR., M.A. Ann Arbor, Mich.	VI.	Assistant Professor of Physics, University of Michigan.
HERBERT A. RICHARDSON . . P. O. Box 373, Lowell, Mass.	V.	Lecturer.
FRANZ H. SCHWARZ . . . . 157 Haverhill St., Lawrence, Mass.	II.	Mechanical Engineer, Pacific Mills.
HENRY D. SEARS . . . . . 7 Arch St., Boston.	VI.	With C. S. Knowles, Electric Railway and Lighting Supplies.
FRANK E. SHEPARD . . . . Thirtieth & Blake Sts., Denver, Colo.	II.	Vice-President and Mechanical Engineer, Denver Engineering Works.
CHARLES P. SMITH . . . . . 5703 Margaretta St., Pittsburgh, Pa.	II.	Draughtsman, Westinghouse Electric and Manufacturing Co.
HARRY E. SMITH . . . . . Milwaukee, Wis.	V.	Chemist, Chicago, Milwaukee, & St. Paul R. R.
J. WALDO SMITH . . . . . 500 Bloomfield Ave., Montclair, N. J.	I.	Chief Assistant Engineer, East Jersey Water Co.
HENRY SOUTHER . . . . . Hartford, Conn.	III.	Chief of Department of Tests, Pope Manufacturing Co.
HOLLON C. SPAULDING . . . 178 Devonshire St., Boston.	II.	Manager, New England Office, Manhattan General Construction Co.
TIMOTHY W. SPRAGUE . . . 4 State St., Boston, and 99 Cedar St., New York, N. Y.	III.	Consulting Engineer for Electric Mining and Power Transmission.
HENRY F. STODDARD . . . . Beverly, N. J.	II.	Superintendent, Penn Cordage Co.
GILES TAINTOR . . . . . Springfield, Mass.	VI.	Superintendent, Western Division, New England Telephone and Telegraph Co.
EDWARD G. THOMAS . . . . 383 Federal St., Boston.	II.	Mechanical Engineer, Blodgett Bros. & Co.
FREDERICK THOMPSON . . . 1322 New York Ave., Washington, D. C.	I.	Bridge Engineer, Southern Ry.
WALTER S. THOMPSON . . . Cleveland, Ohio.	I.	Assistant Engineer, New York, Chicago & St. Louis R. R.

1887. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
GREENLEAF R. TUCKER . . . Boston, Mass.	V.	Professor of General and Pharmaceutical Chemistry, Mass. College of Pharmacy; Professor of Chemistry, Boston Dental College; Chemist, Boston City Hospital.
ALEXANDER H. TWOMBLY . . . Yarmouthville, Me.	II.	Superintendent, Forest Paper Co. (S. D. Warren & Co., Proprietors).
RALPH VOSE . . . . .	VI.	Electrician.
Hyde Park, Mass.		
WALTER G. WHITMORE . . . 44 Broad St., New York, N. Y.	VI.	Local Engineer, New York Office, General Electric Co.
GRANGER WHITNEY . . . . .	III.	With Detroit Safe Co.
67 E. Fort St., Detroit, Mich.		
WILLIAM A. WHITNEY . . . . .	III.	Manager, Emerson Paper Co.
Sunapee, N. H.		
HERBERT A. WILCOX . . . . .	III.	Mining Engineer.
Aspen, Colo.		
SIDNEY WILLIAMS . . . . .	I.	Comptroller, Pennsylvania Coal Co., and Erie & Wyoming Valley R. R.
Dunmore, Pa.		

## 1888.

HENRY D. BATES . . . . .	IV.	Managing Editor, "The Architectural Review."
6 Beacon St., Boston.		
HENRY FORBES BIGELOW . . . . .	IV.	With Winslow & Wetherell, Architects.
3 Hamilton Pl., Boston.		
HERBERT S. BIRD . . . . .	V.	Chemist, New York Tartar Co.
Ninth St. & Gowanus Canal, Brooklyn, N. Y.		
WINSLOW BLANCHARD . . . . .	II.	Treasurer, Blanchard Machine Co.
303 Congress St., Boston.		
ARTHUR T. BRADLEE . . . . .	II.	With Harding, Whitman, & Co.
78 Chauncy St., Boston.		
BENJAMIN G. BUTTOLPH . . . . .	II.	Engineer, State Enterprise and American Mutual Fire Insurance Cos.
87 Weybosset St., Providence, R. I.		
ELBRIDGE S. CARLTON . . . . .	IV.	Architect, Cutting, Carlton & Cutting.
44 Front St., Worcester, Mass.		
DAVID A. CENTER, A.B. . . . .	VI.	Principal, Woodbridge School.
417 Madison Ave., New York, N. Y.		
STEPHEN CHILDS . . . . .	I.	Assistant Engineer, City Engineer's Office, City of Newton.
West Newton, Mass.		
GEORGE E. CLAFLIN . . . . .	VI.	Electrical Engineer.
146 Westminster St., Providence, R. I.		

1888. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
SYLVANUS H. COBB . . . 118 Summit St., Hyde Park, Mass.	VI.	Engineer (Chicago, Ill.).
RUSSELL H. COLBY . . . 15 So. May St., Aurora, Ill.	V.	Superintendent, Chicago & Aurora Smelting and Refining Co.
FRED B. COLE . . . . . 53 State St., Boston.	II.	With Dean & Main, Mill and Mechanical Engineers.
BERTRAND R. T. COLLINS . . . 1 W. Harrison St., Chicago, Ill.	II.	Engineer of Tests, Chicago Edison Co. (Harrison St. Power House).
EDWARD COLLINS, JR. . . . . 985 Adams St., Dorchester, Mass.	VI.	Graduate Student, Harvard University (Cambridge, Mass.).
ARTHUR J. CONNER . . . . . 24 India Sq., Boston.	V.	Dealer in Physicians' Supplies.
RICHARD DEVENS . . . . . Westfield, N. J.	II.	Signal Engineer, The Hall Signal Co.
EDGAR F. DUTTON . . . . . 180 Summer St., Boston.	VI.	With Construction Department, General Electric Co.
HENRY F. EASTMAN . . . . . 327 E. Merrimack St., Lowell, Mass.	II.	Draughtsman, Fifield Tool Co.
RICHARD EPPES, JR. . . . . City Point, Va.	II.	Manager, Appomattox Plantations.
LOUIS A. FERGUSON . . . . . 139 Adams St., Chicago, Ill.	VI.	Electrical Engineer, Chicago Edison Co.
BERTRAM P. FLINT . . . . . 91 Liberty St., New York, N. Y.	II.	With The George F. Blake Manufacturing Co.
THEODORE A. FOQUE . . . . . 318 Sixth Ave., S. E., Minneapolis, Minn.	II.	Assistant Mechanical Superintendent, Minneapolis, St. Paul, & Sault Ste. Marie R. R.
STEJIRO FUKUZAWA . . . . . 2 Second St., Mita, Tokio, Japan.	I.	With the "Jiji Shimpo."
J. EDWARD FULLER, JR. . . . . 452 Main St., Worcester, Mass.	IV.	General Contractor.
WILLIAM H. GERRISH . . . . . 90 Gates St., Lowell, Mass.	II.	With Massachusetts Cotton Mills.
HAROLD G. GROSS . . . . . 535 Fourth St., Eureka, Cal.	VII.	Physician.
GEORGE W. HAMBLET . . . . . Boston, Mass.	II.	Instructor in Mechanical Engineering, Mass. Institute of Technology.
WILLIAM L. HARRIS . . . . . Gerard Lake Ranch, Towner, N. Dak.	VII.	Cattle Raising.
GEORGE L. HARVEY . . . . . 115 Monroe St., Chicago, Ill.	II.	Architect and Mechanical Engineer.
CHARLES F. HASTINGS . . . . . 1225 Mill St., Sta. D, Pittsburgh, Pa.	III.	With Open Hearth Department, Black Diamond Steel Works.

1888.—Continued.

NAME AND ADDRESS.	COURSE.	OCCUPATION.
SAVORY C. HATHAWAY, JR. 33 So. Fountain Ave., Springfield, Ohio.	VI.	Agent, Hathaway Shoe Co.
GEORGE L. HEATH . . . .	V.	Chemist, Calumet & Hecla Smelting Works; Associate Mineral Expert, Calumet & Hecla Stamp Mills.
EDWARD W. HERRICK . . .	II.	Consulting Engineer with Baker, Smith, & Co.
EDWARD C. HOLTON . . . .	V.	Chemist, Sherwin-Williams Co. 100 Canal St., Cleveland, Ohio.
HENRY J. HORN, JR. . . .	I.	Supervisor of Bridges and Buildings, North- ern Pacific R. R. (Minnesota Division). Staples, Minn.
FRANK M. JAMES . . . .	II.	No. Broadway, Haverhill, Mass.
ARTHUR WINSLOW JONES .	VI.	Representing General Electric Co. in Australia. P. O. Box 3597, Boston
EDWIN O. JORDAN, Ph.D. .	VII.	Assistant Professor of Biology, University of Chicago. Chicago, Ill.
WILLIAM T. KEOUGH . . .	II.	Engineer, The Atlantic Works. East Boston, Mass.
GEORGE S. LEE . . . . .	I.	With F. L. Fuller, Civil Engineer. 12 Pearl St., Boston.
JAMES W. LOVELAND . . .	V.	Superintendent, Curtis Davis & Co., Soap Manufacturers. 184 Broadway, Cambridgeport, Mass.
ARTHUR S. MANN . . . . .	II.	With Lammert & Mann, Engineers and Machinists. 51 So. Jefferson St., Chicago, Ill.
CHARLES G. MERRELL . . .	V.	Vice-President and Superintendent, The W. S. Merrell Chemical Co. P. O. Box 786, Cincinnati, Ohio.
FRANK A. MOORE . . . . .	IV.	Architect. 123 E. Twenty-third St., New York, N. Y.
HENRY C. MOORE . . . . .	II.	Care of Hon. Warner Miller, 85 Times Bldg., New York, N. Y.
ADDISON D. NICKERSON . .	I.	Engineer on Sewer Construction. Hyde Park, Mass.
EDWIN R. PEARSON . . . .	VI.	In Alternating Current Department, Gen- eral Electric Co. Lynn, Mass.
CHARLES A. PETERSON, A. B.	VI.	Cambridge, Mass.
HERBERT F. PIERCE . . . .	I.	Assistant Engineer, City Engineer's Office, City of Newton. West Newton, Mass.
GEORGE B. POOL . . . . .	VI.	Book-keeper with Pool Bros. 20 So. Market St., Boston.

1888. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
JOHN STITES RAY . . . . 18 Cheyenne Cañon Road Brookside, Colorado Springs, Colo.	II.	Ore Shippers' Agent.
RUSSELL ROBB . . . . .	VI.	With Carbon Electric Generator Co.
104 Milk St., Boston.		
ODIN B. ROBERTS, A.M., LL.B.	II.	Lawyer.
95 Milk St., Boston.		
FREDERICK H. SAFFORD, A.M.	VI.	Instructor in Mathematics and Graduate Student, Harvard University.
13 Greenough Ave., Cambridgeport, Mass.		
ALFRED H. SAWYER . . . .	II.	General Agent, B. F. Sturtevant Co. (Ja- maica Plain, Mass.).
34 Oliver St., Boston.		
FREDERICK L. SAYER . . . .	II.	With The George F. Blake Manufacturing Co.
91 Liberty St., New York, N. Y.		
WALTER K. SHAW . . . . .	II.	Of Firm of E. A. Shaw & Co., Cotton Brokers.
70 Kilby St., Boston.		
A. W. SABINE SIEBERT, A.M.	VIII.	
40 Shepard St., Cambridge, Mass.		
IVAR L. SJÖSTRÖM . . . . .	I.	Civil Engineer.
Central Bldg., Lawrence, Mass.		
CLARENCE W. SMITH, A.B.	V.	Patent Boiler Setting.
120 Milk St., Boston.		
EDWARD M. SMITH . . . .	II.	Assistant Engineer, Boston & Maine R. R. Boston, Mass.
FRANK O. STETSON . . . .	V.	Observer, U. S. Weather Bureau.
Pierre, So. Dak.		
CHARLES A. STONE . . . .	VI.	Electrical Expert and Engineer, of Firm of Stone & Webster.
4 Post-Office Sq., Boston.		
JOHN M. SULLY . . . . .	III.	Chief Engineer in charge of Mines, Chicka- mauga Coal and Iron Co.
Chickamauga, Ga.		
MARION TALBOT, A.M. . . .	IX.	Dean of the Graduate School and Associate Professor of Sanitary Science, University of Chicago; President of the Association of Collegiate Alumnae.
Kelly Hall, University of Chicago, Chicago, Ill.		
WALTER I. TOWNE . . . .	VI.	Assistant Electrical Engineer, New Eng- land Telephone and Telegraph Co.
125 Milk St., Boston.		
CLARENCE B. VORCE . . . .	I.	Assistant Engineer of Construction, New York, New Haven, & Hartford R. R. Co.
Stamford, Conn.		
A. SYDNEY WARREN . . . .	III.	With Buffalo Smelting Works.
Buffalo, N. Y.		
EDWIN S. WEBSTER . . . .	VI.	Electrical Expert and Engineer, of Firm of Stone & Webster.
4 Post-Office Sq., Boston.		
CHARLES L. WEIL . . . . .	II.	Professor of Mechanical Engineering, Mich- igan State Agricultural College.
Agricultural College, Mich.		



1888. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
ARTHUR S. WILLIAMS . . . Newton Highlands, Mass.	VI.	With American Bell Telephone Co. (42 Farnsworth St., South Boston).
JOHN E. YOUNG . . . . . 53 First St., Portland, Oreg.	I.	Manufacturing Agent, Gannett & Young.

## 1889.

GEORGE M. BASFORD . . . 818 Rookery Bldg., Chicago, Ill.	II.	Mechanical Editor, "The Railway Review."
EDWARD J. BEACH . . . . . 1183 Locust St., Dubuque, Iowa.	V.	Soap Manufacturer, of Firm of James Beach & Sons.
ARTHUR B. BELLOWS . . . . . 116 Water St., Pittsburgh, Pa.	II.	General Manager and Member of the Firm, Pittsburgh, Testing Laboratory, Limited.
WILLARD G. BIXBY . . . . . 194 Hester St., New York, N. Y.	II.	With S. M. Bixby & Co., Manufacturers of Shoe Blackings.
ZENAS W. BLISS . . . . . P. O. Box 1545, Providence, R. I.	II.	In Real Estate Business.
CHARLES N. BORDEN . . . . . 511 Rock St., Fall River, Mass.	II.	Clerk, Richard Borden Manufacturing Co.
FREDERICK W. BRADLEY . . . 202 Equitable Bldg., Boston.	VI.	Manufacturers' Agent.
FREDERICK H. BRAINERD . . . 313 Vineville St., Macon, Ga.	III.	Chemist, Georgia Mills and Elevator Co.
LUTHER W. BRIDGES . . . . . 163 So. Canal St., Chicago, Ill.	II.	Representing The Geo. F. Blake Manufacturing Co. and Knowles Steam Pump Works.
J. NORMAN BULKLEY . . . . . Schenectady, N. Y.	VI.	With General Electric Co.
FRANK H. CILLEY . . . . . Care H. E. Cilley, 118 South St., Boston.	I.	
FRED CRABTREE . . . . . McKeesport, Pa.	V.	Chemist, Monongahela Furnaces.
CHARLES H. CROMWELL . . . Baltimore, Md.	II.	Of Cromwell Bros., Brick Manufacturers.
ROLAND N. CUTTER . . . . . City Hall, Boston.	I.	In Engineering Department, City of Boston.
FRANK L. DAME . . . . . Tacoma, Wash.	VI.	General Superintendent, Tacoma Railway and Motor Co.
WILLIAM S. DAVENPORT . . . Göttingen, Germany.	V.	Student, University of Göttingen.
ARTHUR L. DAVIS . . . . . St. Albans, Vt.	II.	Manager, The Vermont Construction Co.
CHARLES B. DODGE . . . . . 258 Washington St., Boston.	IX.	In Real Estate Business.
NATHAN DUFFEE . . . . . 78 Bedford St., Fall River, Mass.	II.	Broker. (Cotton and Cloth.)

1889. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
HARRISON G. DYAR, Ph.D. 243 W. Ninety-ninth St., New York, N. Y.	V.	Assistant in Bacteriology, Columbia University.
ARTHUR V. EDWARDS . . . 125 Milk St., Boston.	IV.	Draughtsman, Engineering Department, American Bell Telephone Co.
J. PARKER B. FISKE . . . 164 Devonshire St., Boston.	VI.	With Fiske, Homes & Co., Architectural Clay Products.
ALFRED W. FRENCH . . . 45 W. Polk St., Chicago, Ill.	I.	Superintendent, The Wright & Lawther, Oil and Lead Manufacturing Co.
EDWARD V. FRENCH . . . 31 Milk St., Boston.	II.	Inspector, Associated Factory Mutual Fire Insurance Cos.
HOLLIS FRENCH . . . . . 3 Hamilton Pl., Boston.	VI.	Consulting Engineer.
EARL W. GANNETT . . . . . Brown Block, Omaha, Neb.	VI.	Receiver, Omaha Fire Insurance Co.
JAMES P. GILBERT . . . . . Warren, Ohio.	V.	General Superintendent, New York & Ohio Co., Manufacturers of Incandescent Lamps, etc.
BENJAMIN W. GUPPY . . . . . Union Station, Boston.	I.	Assistant Bridge Engineer, Boston & Maine R. R.
HENRY M. HOBART . . . . . 38 Parliament St., London, S. W., England.	VI.	With British Thomson-Houston Co. (Lim- ited).
FRANKLIN W. HOBBS . . . . . 78 Chauncy St., Boston.	II.	Assistant Treasurer, Arlington Mills.
GEORGE U. G. HOLMAN . . . . . Oak Lane, Station 24, Philadelphia, Pa.	VI.	Secretary, Treasurer, and Manager, Chel- tenham Electric Light, Heat, and Power Co.
RICHARD HOOKER . . . . . 89 Vandergrift Bldg., Pittsburgh, Pa.	IV.	With Alden & Harlow, Architects.
FREDERICK L. HOPKINS . . . . . Providence, R. I.	V.	Night Editor, Providence Journal.
HARRY H. HUNT . . . . . Equitable Bldg., Boston.	VI.	Electrical Engineer and Manufacturers' Agent.
EDWARD S. HUTCHINS . . . . . Bath, Me.	II.	Chief Draughtsman, Engineering Depart- ment, Bath Iron Works.
LEWIS E. JOHNSON . . . . . Steelton, Pa.	II.	Assistant Engineer, Pennsylvania Steel Co.
WILLIAM S. JOHNSON . . . . . State House, Boston.	I.	Assistant Engineer, Mass. State Board of Health.
WALTER H. KILHAM . . . . . 3 Hamilton Pl., Boston.	IV.	With Winslow & Wetherell, Architects.
ARTHUR D. KINSMAN . . . . . Ipswich, Mass.	VIII.	Farming.

1889. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
LEWIS H. KUNHARDT . . . 31 Milk St., Boston.	II.	Head Draughtsman, Associated Factory Mutual Fire Insurance Cos.
GEORGE B. LAUDER . . . Concord, N. H.	VI.	Inspector, New Hampshire Board of Fire Underwriters.
FRANK A. LAWS . . . . . Boston, Mass.	VI.	Instructor in Electrical Measurements, Mass. Institute of Technology.
WILLIAM W. LEWIS . . . . 20 Beacon St., Boston.	II.	Assistant Engineer, Boston Transit Commission.
JOHN W. LINZEE, JR., A.B. 94 Waltham St., Boston.		With R. H. White & Co.
HARRISON LORING, JR. . . 33½ India St., Boston.	II.	Of Firm of R. S. Brinc & Co.
SAMUEL H. MILDDRAM . . . 125 Milk St., Boston.	I.	With American Bell Telephone Co.
WILLIAM E. MOTT . . . . . Ithaca, N. Y.	I.	Instructor in Civil Engineering, Cornell University.
CLAYTON W. PIKE . . . . . 711 Reading Terminal Bldg., Philadelphia, Pa.	VI.	Electrical Engineer, The Falkenau Engineering Co. (Limited).
CHARLES W. POWER . . . . . Pittsfield, Mass.	VI.	With D. M. Collins & Co., Berkshire Knitting Mills.
FRED W. RANNO . . . . . P. O. Box 609, La Porte, Ind.	I.	Resident Engineer, Lake Shore & Michigan Southern Ry.
GEORGE L. RICHARDSON . . . San Rafael, Cal.	I.	City Engineer and County Surveyor.
GEORGE W. ROUNDS . . . . . Roslindale, Mass.	VI.	Superintendent, West Roxbury & Roslindale Street Ry. Co.
FRANK E. SANBORN . . . . . Tufts College, Mass.	II.	Instructor in Mechanical Engineering.
ALBERT SAUVEUR . . . . . South Chicago, Ill.	III.	With Illinois Steel Co. (South Works).
EDWARD V. SHEPARD . . . . . 910 Corn Exchange Bank Bldg., New York, N. Y.	I.	Consulting Engineer.
WILLIAM G. SNOW . . . . . 31 Union St., Boston.	II.	With Walker & Pratt Manufacturing Co.
DELIA STICKNEY . . . . . 19 Trowbridge St., Cambridge, Mass.	V.	Instructor in Chemistry, Cambridge English High School.
RALPH SWEETLAND . . . . . 55 Kilby St., Boston.	II.	With New England Insurance Exchange.
SANFORD E. THOMPSON . . . Newton Highlands, Mass.	I.	Civil Engineer.
FRANK H. THORP, Ph.D. . . . Boston, Mass.	V.	Instructor in Industrial Chemistry, Mass. Institute of Technology.

1889. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
WILLIAM B. THURBER, S.M. Central St., Lowell, Mass.	IX.	Division Superintendent, New England Telephone and Telegraph Co.
ARTHUR E. TRUESDELL . . . 7 Clinton St., Newark, N. J.	VI.	With People's Light and Power Co.
WILLIAM W. UNDERHILL . . . 43 Milk St., Boston.	II.	With Fuller & Warren Warming and Ventilating Co.
CHARLES H. WARNER . . . 50 Broadway, New York, N. Y.	VI.	Consulting and Supervising Engineer.
GEORGE C. WHIPPLE . . . Brighton, Mass.	I.	Biologist, Boston Water Works.
JASPER WHITING . . . . . 1041 The Rookery, Chicago, Ill.	III.	Manager Cement and Brick Department, Illinois Steel Co.
FRANK P. WHITNEY . . . . . 125 Milk St., Boston.	VI.	With New England Telephone and Telegraph Co.
ROBERT C. WILLIAMS . . . . . Ely, Minn.	III.	Engineer, Chandler Iron Co.; also of Williams Brothers, Fruit Growers, Fla.
ARTHUR L. WILLISTON . . . . . Columbus, Ohio.	II.	Director of Industrial Department, Ohio State University.
VICTOR WINDETT . . . . . South Chicago, Ill.	II.	With Illinois Steel Co., South Works.
CAROLINE A. WOODMAN, A.M. Lewiston, Me.	VII.	Librarian, Bates College.
WALTER G. WUICHET . . . . . 418 W. First St., Dayton, Ohio.	II.	Superintendent, A. A. Simonds & Son, Manufacturers of Knives.

## 1890.

ARTHUR H. ADAMS . . . . . 46 Avenue de Breteuil, Paris, France.	II.	Superintendent, Société de Matériel Téléphonique.
CHARLES H. ALDEN, JR. . . . . 53 State St., Boston.	IV.	Draughtsman with Peabody & Stearns, Architects.
FRANK W. ATWOOD . . . . . 98 Commercial St., Boston.	V.	Agent for The Heller & Menz Co., American Ultramarine and Globe Aniline Works.
ARTHUR W. AYER . . . . . Burlington, Vt.	II.	Professor of Mechanical Engineering, University of Vermont.
CYRUS C. BABB . . . . . Washington, D. C.	I.	Assistant Hydrographer, U. S. Geological Survey.
JOSEPH B. BAKER . . . . . 125 Milk St., Boston.	VI.	With American Telephone and Telegraph Co.
HIRAM E. BALDWIN . . . . . Cleveland, Ohio.	I.	Chief Engineer, The Brown Hoisting and Conveying Machine Co.
SPAULDING BARTLETT . . . . . Webster, Mass.	V.	Assistant Superintendent, Slater Woollen Co.

## 1890.—Continued.

NAME AND ADDRESS.	COURSE.	OCCUPATION.
JOHN L. BATCHELDER, JR. 356 Federal St., Boston.	VII.	Of Firm of Batchelder Bros.
CHARLES B. BEASOM . . . . 135 Carondelet St., New Orleans, La.	II.	Of Swanitz & Beasom, Consulting and Contracting Engineers.
ELIZABETH E. BICKFORD, Ph.D. Poughkeepsie, N. Y.	VII.	Instructor in Biology, Vassar College.
JOHN B. BLOOD . . . . . Kurfürstenstr. 109, Berlin W., Germany.	VI.	Engineer, with Union Elektricitäts Gesellschaft.
AUSTIN D. BOSS . . . . . 34 Morgan St., Hartford, Conn.	II.	Manager, Hartford Department, Willimantic Linen Co.
CHARLOTTE A. BRAGG . . . . Wellesley, Mass.	V.	Instructor in Chemistry, Wellesley College.
EDWARD F. BRAGG . . . . . 283 Devonshire St., Boston.	II.	President and General Manager, Automatic Rubber Mixer Co.
EDWARD D. BROWN . . . . . 18 Cortlandt St., New York, N. Y.	VI.	With American Telephone and Telegraph Co.
ERNEST H. BROWNELL, A.B. 174 Weybosset St., Providence, R. I.	I.	With Samuel M. Gray, Consulting Engineer.
EDWARD C. BURNHAM, A.B. Providence, R. I.	II.	Associate Professor of Mechanical Engineering, Brown University.
GARY N. CALKINS . . . . . New York, N. Y.	IX.	Instructor in Biology, Columbia University; Instructor in Zoölogy, Barnard College.
MORTEN CARLISLE . . . . . 828 W. Sixth St., Cincinnati, Ohio.	VI.	With Carlisle & Finch, Electrical Engineering, Manufacturing, and Repairing.
CHESTER V. CARLTON . . . . Rimouski, Que.	I.	Superintendent, Rimouski Lumber Co.
JAMES A. CARNEY . . . . . Aurora, Ill.	V.	Engineer of Tests, Chicago, Burlington, & Quincy R. R.
GEORGE D. CHAPMAN . . . . Fitchburg, Mass.	II.	Mechanical Engineer, Fitchburg Machine Works.
FRANK L. CHASE . . . . . 1065 Story Ave., Louisville, Ky.	I.	President, The Bell & Coggeshall Co.; Bridge Engineer, The Baltimore & Ohio Southwestern Ry.
JAMES CLARK, JR. . . . . 313 W. Main St., Louisville, Ky.	VI.	Of Firm of James Clark, Jr., & Co., Electrical Supplies.
WILLIAM H. COLLINS . . . . Providence, R. I.	V.	With Silver Spring Bleaching and Dyeing Co.
WALTER F. COOK . . . . . 23 Avon St., Boston.	IX.	With T. D. Cook & Co.
JOHN G. CRANE . . . . . 348½ Sussex Ave., Newark, N. J.	I.	

1890 — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
DARRAGH DE LANCEY . . . Rochester, N. Y.	II.	Manager, Kodak Park Works, Eastman Kodak Co.
ALEXANDER J. DELANO . . . 125 Milk St., Boston.	I.	Draughtsman, Engineering Department, American Bell Telephone Co.
JOHN O. DEWOLF . . . . . 33 Hampshire St., Cambridgeport, Mass.	II.	Assistant Superintendent, Boston Woven Hose and Rubber Co.
FREDERICK H. DODGE . . . 10 Produce Exchange Bldg., Toledo, Ohio.	II.	Treasurer, Bissell, Dodge, & Erner Co., Electrical Supplies and Machinery, and F. H. Dodge & Co., Insurance.
FRANCIS W. DUNBAR . . . 417 W. Twenty-third St., New York, N. Y.	VI.	Electrical Engineer.
PIERRE S. DU PONT . . . . Wilmington, Del.	V.	With E. du Pont, De Nemours, & Co.
EDWIN F. DWELLEY . . . . 25 Baltimore St., Lynn, Mass.	I.	With Isaac K. Harris, Civil Engineer and Surveyor.
ELWOOD A. EMERY, B.L. . . Grinnell, Iowa.	IV.	Director of Vocal Culture, Iowa College.
WILLIAM H. FENN . . . . . 222 Whiton St., Jersey City, N. J.	I.	Chief Engineer, Hay Foundry and Iron Co. (Newark, N. J.).
WILLIAM P. FLINT . . . . . East Pittsburgh, Pa.	II.	With Pittsburgh Meter Co.
SAMUEL D. FLOOD . . . . . 229 So. Water St., Chicago, Ill.	II.	Manager, A. H. Barber & Co., Builders of Ice and Refrigerating Machinery.
GEORGE W. FULLER . . . . . 549 Third St., Louisville, Ky.	V.	Chief Chemist and Bacteriologist, Louis- ville Water Co.
GEORGE L. GILMORE . . . . Lexington, Mass.	II.	With Gilmore & Haigh, Middlesex Bleach, Dye and Print Works (Somerville, Mass.).
JOHN W. GLIDDEN . . . . . De Kalb, Ill.	II.	Superintendent, De Kalb Electric Co.
HARRY M. GOODWIN, Ph.D. . Boston, Mass.	VIII.	Instructor in Physics, Mass. Institute of Technology.
FRANK M. GREENLAW . . . South Berwick, Me.	VI.	Teacher, South Berwick Academy
GEORGE E. HALE . . . . . Williams Bay, Wis.	VIII.	Director, Yerkes Observatory, of the Uni- versity of Chicago.
JOHN R. HALL . . . . . P. O. Box O, Redlands, Colo.	VI.	Electrical Engineer.
PHILIP M. MAMMETT, A.B. . Boston, Mass.	II.	Master Mechanic, Boston Shop, Boston & Maine R. R.
CHARLES HAYDEN . . . . . 87 Milk St., Boston.	IX.	Of Firm of Hayden, Stone, & Co., Bankers.
SOPHIA G. HAYDEN . . . . 7 Myrtle St., Boston.	IV.	Designer and Decorator.

1890. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
FRANK HAYES . . . . . Lamborn Ave., & No. Third St., West Superior, Wis.	II.	Manager, Superior Iron Works.
HARRY E. HAYES, A.B. . . . . 153 Cedar St., New York, N. Y.	VI.	With American Telephone and Telegraph Co.
SCHUYLER HAZARD . . . . . Third & Smith Sts., Cincinnati, Ohio.	I.	Assistant Engineer, Cleveland, Cincinnati, Chicago, & St. Louis Ry.
FREDERICK S. HOLLIS, Ph.D. . . . . Newton Highlands, Mass.	V.	With Boston Water Works.
S. ELLSWORTH HORTON . . . . . Windsor Locks, Conn.	II.	Superintendent, The E. Horton & Son Co., Manufacturers of Horton Chucks.
FRANCIS H. KENDALL . . . . . Court House, East Cambridge, Mass.	I.	Engineer for Middlesex County Commis- sioners.
HARRY A. KENNICOTT . . . . . Nebraska City, Neb.	I.	Civil Engineer and Draughtsman.
FRANKLIN KNIGHT . . . . . Colorado City, Colo.	I.	Minister, Church of the Good Shepherd.
BERTRAM A. LENFEST . . . . . Broadway & York Sq., New Haven, Conn.	II.	Instructor in Machine Toolwork, Board- man Manual Training High School.
ERNEST A. LE SUEUR . . . . . Rumford Falls, Me.	VI.	General Manager, The Electro-Chemical Co.
BERTRAM H. MANN . . . . . Somerset, Ky.	VI.	Superintendent of Signals, Chattanooga Division, Chicago, New Orleans, and Texas Pacific Ry.
GEORGE B. MCCONNELL . . . . . 516 Warren St., Roxbury, Mass.	I.	With Board of Street Commissioners, City of Boston.
FREDERICK METCALF . . . . . Providence, R. I.	II.	Superintendent, American Ship Windlass Co.
BURDETT MOODY . . . . . Lead, S. Dak.	I.	Engineer, Homestake and Associate Mining Companies.
STEPHEN W. MOORE . . . . . 905 No. Wahsatch Ave., Colorado Springs, Colo.	II.	Dealer in Bicycles and Supplies.
CHARLES NEAVE, A.M. . . . . 80 Broadway, New York, N. Y.	VI.	Of Firm of Fish, Richardson, & Storrow, Lawyers.
ALLAN H. NEWELL . . . . . 18 E. Flora St., Stockton, Cal.	II.	Of Firm of Tretheway, Dasher, & Newell, Stockton Iron Works.
NORMAN G. NIMS . . . . . 8 Beacon St., Boston.	IV.	Draughtsman with Andrews, Jaques, & Rantoul, Architects.
ALMON E. NORRIS . . . . . 29 Main St., Cambridgeport, Mass.	II.	Consulting Engineer, Rawson & Morrison Manufacturing Co.

## 1890.—Continued.

NAME AND ADDRESS.	COURSE.	OCCUPATION.
CLARENCE G. NORRIS . . . 45 Water St., Hyde Park, Mass.	I.	With Percy M. Blake, Civil Engineer.
HARRY L. NOYES . . . . Buffalo, N. Y.	I.	Draughtsman, Buffalo Bridge and Iron Works.
JOSEPH K. NOYES . . . . 13 Ferry St., Binghamton, N. Y.	I.	Of the Firm of Joseph P. Noyes & Co., Manufacturers of Combs and Buttons.
GEORGE A. PACKARD . . . P. O. Box 592, Butte, Mont.	III.	Mining Engineer and Metallurgist.
WILLIAM R. PEYTON . . . Superior, Wis.	II.	Treasurer, William Listman Milling Co.
WILLIAM B. POLAND . . . 275 No. Delaware St., Indianapolis, Ind.	I.	Assistant Engineer, Cleveland, Cincinnati, Chicago, & St. Louis Ry.
EDWARD B. RAYMOND . . . 168 Lafayette St., Schenectady, N. Y.	VI.	Electrical Engineer, General Electric Co.
CALVIN W. RICE . . . . Anaconda, Mont.	VI.	With Anaconda Copper Mining Co.
KNIGHT C. RICHMOND, B.P. Crompton, R. I.	II.	Mechanical Engineer, Crompton Co.
WILLIAM Z. RIPLEY, Ph.D. Boston, Mass.	I.	Assistant Professor of Sociology and Eco- nomics, Mass. Institute of Technology; Lecturer on Anthropology, Columbia University.
HAROLD B. ROBERTS . . . 125 Milk St., Boston, Mass.	II.	Foreman, Construction Department, New England Telephone and Telegraph Co.
EDWARD ROBINSON . . . . Potsdam, N. Y.	II.	Instructor in Drawing and Mechanism, The Thomas S. Clarkson Memorial School of Technology.
ALLEN H. ROGERS . . . . Apartado 113, Matchuala, S. L. P., Mexico.	III.	Assayer, Negociacion minera Sta. Maria de La Paz.
MINNIE H. ROGERS . . . . Forest Hills St., Jamaica Plain, Mass.	IX.	Principal of Private School.
LOUIS SCHMIDT . . . . . 215 E. Fourth St., Cincinnati, Ohio.	V.	Chemist, Ohio Dairy and Food Commission.
ADELAIDE SHERMAN . . . . 4 Crawford St., Roxbury, Mass.	V.	Teacher of Chemistry (High School, Lynn, Mass.).
CHARLES W. SHERMAN . . . 35 Langdon St., Cambridge, Mass.	I.	Assistant Engineer, Boston Water Works
EDMUND T. SIMPSON . . . . 84 Middle St., Lowell, Mass.	V.	With Simpson & Rowland.



1890. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
HOWARD C. SLATER . . . Menominee and Jefferson Sts., Milwaukee, Wis.	II.	Superintendent, Gas Works.
WILLIAM LINCOLN SMITH . . . Boston, Mass.	VI.	Instructor in Electrical Engineering, Mass. Institute of Technology.
GEORGE A. SONNEMANN . . . Kellogg, Idaho.	III.	Superintendent, The Bunker Hill & Sullivan Mining and Concentrating Co. (Wardner, Idaho).
MARTIN O. SOUTHWORTH . . . W. Merrill and Willow Sts., Indianapolis, Ind.	VI.	Manager, Commercial Electric Co.
SAMUEL STORROW, A.B. . . . North Yakima, Wash.	I.	Hydraulic Engineer.
BENTON STURGES . . . . . 108 Dearborn St., Chicago, Ill.	IX.	In Real Estate and Mortgage Business.
THOMAS J. STURTEVANT . . . Harrison Square, Mass.	VI.	With Sturtevant Mill Co.
FREDERICK W. SWANTON . . . Bath, Me.	VI.	In Treasurer's Office, Eastern Steamboat Co.
JOHN HENRY TOWNE . . . . . 84 Chambers St., New York, N. Y.	IX.	With The Yale & Towne Manufacturing Co.
ELTON D. WALKER . . . . . 16 Gillespie St., Schenectady, N. Y.	I.	Instructor in Engineering, Union College.
ROBERT T. WALKER . . . . . Tremont Bldg., Boston.	IV.	Draughtsman, with A. W. Longfellow, Jr., Architect.
FRANKLIN W. WHITE . . . . . Boston, Mass.	VII.	House Physician, Boston Lying-In Hospital.
WILLIS R. WHITNEY, Ph.D. Boston, Mass.	V.	Instructor in Sanitary Chemistry, Mass. Institute of Technology.
ARTHUR R. WILSON . . . . . 29 Macdonough Bldg., Oakland, Cal.	I.	City Engineer and Commissioner of Public Works.
ANDREW W. WOODMAN . . . . . 84 Bellingham St., Chelsea, Mass.	I.	With Boston Bridge Works (Boston, Mass.).

## 1891.

CHARLES W. AIKEN . . . . . Cambridgeport, Mass.	II.	With Curtis Davis & Co., Soap Manufac- turers.
ROBERT S. BALL . . . . . 16 Norton Bldg., Louisville, Ky.	II.	Consulting Engineer.
JOEL G. BARRI . . . . . 16 City Hall Ave., Boston.	I.	Civil Engineer.

1891. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
WILLIAM H. BASSETT . . . 236 Maxfield St., New Bedford, Mass.	V.	Teacher of Chemistry, Swain Free School; Chemist, Pope's Island Manufacturing Corporation.
ADELAIDE BIRD . . . . .	VII.	Teacher of Biology, Wilson College. Chambersburgh, Pa.
JOHN H. BIRKS . . . . . Philips Sq., Montreal, Que.	II.	Of Firm of Henry Birks & Sons.
ETHEL B. BLACKWELL, M.D. . . . . 139 W. Sixty-fourth St., New York, N. Y.	VII.	Graduate Student, Johns Hopkins Medical College.
FREDERICK C. BLANCHARD . . . . . 303 Congress St., Boston.	II.	Secretary, Blanchard Machine Co.
THOMAS V. BOLAN, A.B. . . . . Schenectady, N. Y.	VI.	Supervising Engineer, Construction De- partment, General Electric Co.
HENRY G. BRADLEE . . . . . 4 Post-Office Sq., Boston.	VI.	With Stone & Webster, Electrical Experts and Engineers.
HARRY C. BRADLEY . . . . . 5 Gay Head St., Roxbury.	I.	
WALLACE H. BRAINERD . . . . . 1407 W. Eighty-seventh St., Chicago, Ill.	VI.	
HORACE L. BRAND . . . . . 32 Cedar St., Chicago, Ill.	II.	Vice-President, J. P. Wolf Manufacturing Co.
DIXIE LEE BRYANT . . . . . Greensboro, N. C.	XII.	Teacher of Geology and Biology, State Normal School.
WILLIAM P. BRYANT . . . . . 55 Kilby St., Boston.	X.	With Inspection Department, Boston Board of Fire Underwriters.
GEORGE W. BRYDEN . . . . . 47 No. Market St., Boston.	II.	With Bryden & Estabrook, Commission Merchants.
FRANK H. BURTON . . . . . 40 Bassett St., Providence, R. I.	II.	Chief Draughtsman, Armington & Sims Engine Co.
GEORGE A. CAMPBELL, A.M. . . . . Derry, N. H.	I.	
BARNARD CAPEN, JR. . . . . 104 Milk St., Boston.	VI.	With New England Telephone and Tele- graph Co.
ANNE WHITE CARPENTER . . . . . 357 Pennsylvania St., Buffalo, N. Y.	V.	
HUGH B. CLEMENT, Ph.B. . . . . 31 E. Seventeenth St., New York, N. Y.	IV.	Draughtsman with Cady, Berg, & See, Architects.
ALBERT L. CLOUGH . . . . . 181 Walnut St., Manchester, N. H.	VI.	General Manager, Brodie Electric Co.
FRED A. COLE . . . . . Gloversville, N. Y.	II.	With Cayadutta Chemical Co.

1891. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
HARRISON I. COLE . . . . East Boston, Mass.	II.	Draughtsman, The Atlantic Works.
REUBEN B. COLLINS . . . . High St., Dedham, Mass.	I.	Assistant Engineer, New York, New Haven, & Hartford R. R.
ROGER W. CONANT . . . . 439 Albany St., Boston.	VI.	With Electrical Department, West End Street Ry. Co.
EDWARD CUNNINGHAM . . . . 70 Kilby St., Boston.	X.	With Samuel Cabot, Manufacturing Chemist.
HERBERT C. DAGGETT . . . . 66 Broadway, Lowell, Mass.	I.	Assistant Engineer, Office of Locks and Canals.
HOWARD A. DILL, B.S. . . . . Richmond, Ind.	I.	Secretary and Treasurer, Richmond Bicycle Co.
EDWARD W. DONN, JR. . . . . 911 G St., N. W., Washington, D. C.	IV.	Of Firm of Donn & Peter, Architects.
FRANK H. DORR . . . . . Somersworth, N. H.	VI.	
LEWIS A. DUNHAM . . . . . Puerto Barrio, Guatemala, C. A.	I.	With "Ferro Carril del Norte."
PAUL W. ENGLAND . . . . . 406 Market St., Philadelphia, Pa.	VI.	With Bell Telephone Co. of Philadelphia.
HORACE H. ENSWORTH . . . . . Hartford, Conn.	VI.	Of Firm of L. L. Ensworth & Son, Iron and Steel.
GEORGE W. FAVOR . . . . . 54 No. Clinton St., Chicago, Ill.	III.	Representing Sullivan Machinery Co.
HENRY A. FISKE . . . . . 93 Water St., Boston.	X.	Inspector, Underwriters' Bureau of New England.
HOWARD C. FORBES . . . . . 4 State St., Boston.	X.	Manager of Boston Office, for Charles H. Davis, Engineering (New York, Philadelphia and Boston).
LESTER G. FRENCH . . . . . 9 Codding St., Providence, R. I.	II.	With Builders' Iron Foundry.
FREDERIC W. FÜGER . . . . . Governor's Island, New York, N. Y.	II.	Second Lieutenant, U. S. Infantry.
CHARLES GARRISON . . . . . 93 Federal St., Boston.	VI.	Treasurer and Manager, Shawmut Fuse Wire Co.
MEDOREM W. GREER . . . . . Stanford University, Cal.	VI.	Engaged in Literary Work.
EDGAR L. HAMILTON . . . . . Marinette, Wis.	III.	Secretary, Marinette and Menominee Paper Co.
CHARLES F. HAMMOND . . . . . 1015 Hammond Bldg., Detroit, Mich.	I.	In Business.
WILLIAM HASKINS . . . . . 25 Linden St., Waltham, Mass.	III.	Treasurer, Waltham Lumber Co.

1891. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
ARTHUR E. HATCH . . . . 13 Eddy St., Providence, R. I.	I.	With Henry R. Worthington, Hydraulic Machinery.
HERBERT E. HATHAWAY . . . . Providence, R. I.	V.	With Silver Spring Bleaching and Dyeing Co.
ERNEST A. HERSAM . . . . Berkeley, Cal.	V.	Instructor in Metallurgy and Analytical Assistant, University of California.
GEORGE A. HOLMES . . . . 95 Milk St., Boston.	X.	With Consolidated Fastener Co.
WALTER E. HOPTON . . . . 616 Bergen Ave., Jersey City, N. J.	II.	Mechanical Engineer, Colgate & Co.
HARRY W. JORDAN . . . . 406 E. Willow St., Syracuse, N. Y.	V.	Manager, Loewig Caustic Soda Department, Solvay Process Co.
MILTON H. KAUFFMAN . . . . 53 Dearborn St., Chicago, Ill.	V.	Consulting and Analytical Chemist.
THOMAS M. KEENE . . . . 4 Mt. Vernon St., Boston.	I.	Assistant Engineer, Mass. Highway Commission.
WILLIAM F. KEENE . . . . 84 Cross St., Central Falls, R. I.	I.	City Engineer.
HERBERT S. KIMBALL . . . . 7 Exchange Pl., Boston.	X.	Of Hall & Kimball, Architects and Mill Engineers.
MORRIS KNOWLES, 2d . . . . 3 Mt. Vernon St., Boston.	I.	Assistant Engineer, Metropolitan Water Board.
WILLIAM H. LAWRENCE . . . . Boston, Mass.	IV.	Assistant Professor of Architecture, Mass. Institute of Technology.
WOODRUFF LEEMING . . . . 87 Nassau St., New York, N. Y.	IV.	Architect.
WILLIAM E. LELAND . . . . Fulton Bldg., New York, N. Y.	II.	With A. R. Wolff, Consulting Engineer.
MARGARET E. MALTBY, Ph.D. VIII. Wellesley, Mass.	IV.	Associate Professor of Physics, Wellesley College.
ARTHUR N. MANSFIELD . . . . 153 Cedar St., New York, N. Y.	VIII.	With American Telephone and Telegraph Co.
CLEMENT MARCH . . . . Bridgeport, Conn.	I.	With American Graphophone Co.
PHILIP MARQUAND, A.B. . . . 70 Kilby St., Boston, Mass.	I.	Of Marquand & Stearns, Agents, Edge Moor Bridge Works.
ALEXANDER G. MCKENNA . . . . Demmler, Pa.	V.	Chemist, Sterling Steel Works.
GUY EDWARD MITCHELL . . . . Medford, Mass.	II.	Chief Draughtsman, Motive Power Department, Boston & Maine R. R.
FREDERICK CLOUSTON MOORE II. Auburn, N. Y.	II.	Assistant General Superintendent, D. M. Osborne & Co., Manufacturers of Harvesting Machinery.
FRED F. MOORE . . . . 114 Hollis St., South Framingham, Mass.	I.	Draughtsman, Metropolitan Water Board.

1891. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
ALEXANDER W. MOSELEY . . . Boston, Mass.	II.	Instructor in Mechanical Engineering, Mass. Institute of Technology.
WILLIAM MOSSMAN . . . . Mattapan, Mass.	VI.	Assistant Superintendent, Mattapan Mills, The Tileston & Hollingsworth Co.
FRED E. NORTON . . . . . Johannesburg, South African Republic.	II.	Mechanical Engineer for Edw. P. Allis Co. (Milwaukee, Wis.).
GEORGE H. K. OXFORD . . . . 24 Cottage St., Cambridge, Mass.	VI.	
WILLIAM I. PALMER . . . . . 103 Medford St., Charlestown, Mass.	VI.	With Palmer, Parker, & Co.
ALLAN RAMSEY . . . . . Cincinnati, Ohio.	VII.	Interne, Cincinnati Hospital.
CARLETON A. READ . . . . . Boston, Mass.	II.	Instructor in Mechanical Engineering, Mass. Institute of Technology.
WILLIAM C. RICHARDSON . . . P. O. Box 5282, Boston.	II.	Travelling.
CHARLES W. RICKER . . . . . D.S. Morgan Bldg., Buffalo, N.Y.	VI.	Electrical Engineer.
WILLIAM J. ROBERTS, A.B. . . Pullman, Wash.	I.	Assistant Professor of Mathematics and Civil Engineering, Washington Agricul- tural College.
WILLARD H. ROOTS . . . . . 22 Lawrence Hall, Cambridge, Mass.	IX.	Student, Episcopal Theological School.
FREDERICK H. ROSE . . . . . 1022 Euclid Ave., Cleveland, Ohio.	II.	Manager, Cleveland Chocolate and Cocoa Co.
A. FORREST SHATTUCK . . . . Syracuse, N. Y.	V.	Chemist, Solvay Process Co.
FREDERICK T. SNYDER . . . . 133 Seventeenth St., Milwaukee, Wis.	VI.	With Edward P. Allis Co., Mining De- partment.
THEODORE SPENCER . . . . . 406 Market St., Philadelphia, Pa.	VI.	With Bell Telephone Co. of Philadelphia.
GEORGE H. SPOONER . . . . . 55 Kilby St., Boston.	VI.	Electrical Inspector, Boston Board of Fire Underwriters.
SOLOMON H. STIX . . . . . 1241 State St., Chicago, Ill.	IV.	Of the Firm of Friedlander, Brady, & Co., Manufacturers of Knitted Goods.
ARTHUR B. STODDARD . . . . La Salle, Ill.	V.	Superintendent, Acid Department, Mat- thiessen & Hegeler Zinc Co.
JAMES SWAN . . . . . Arcadia St., Dorchester, Mass.	II.	Studying Abroad.
HENRY H. SYKES, Ph.B. . . . Tenth & Olive Sts., St. Louis, Mo.	VI.	Chief Engineer, Bell Telephone Co. of Missouri.

1891. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
HARRY B. TAYLOR . . . Care of Prentiss Webster, 69 Myrtle St., Lowell, Mass.	V.	Travelling.
HERBERT A. THOMPSON Amherst, Mass.	VIII.	Apparatus Maker, Amherst College.
CLIFFORD M. TYLER . . . Harvard St., Brookline, Mass.	II.	Treasurer, Aberthaw Construction Co. (31 State St., Boston).
LUIS F. VERGES . . . 37 Central St., Boston.	I.	In Business.
FRANCIS S VIELÉ, A.B. . . Westinghouse Bldg., Pittsburgh, Pa.	VI.	With Standard Underground Cable Co.
HENRY H. WAIT . . . 227 So. Clinton St., Chicago, Ill.	VI.	With Western Electric Co.
GEORGE M. WARNER . . . 50 Broadway, New York, N. Y.	VI.	Consulting and Supervising Engineer.
LEONARD C. WASON . . . 31 State St., Boston.	VI.	President, Aberthaw Construction Co., Concrete Engineers and Contractors.
HENRY T. WEED . . . Court & Livingston Sts., Brooklyn, N. Y.	V.	Teacher of Physics and Chemistry, Manual Training High School.
WILLIAM H. WESTON . . . P. O. Box 2916, Boston, Mass.	III.	President and General Manager, Guys- boro Mining and Milling Co. (Melrose, Nova Scotia).
CHARLES P. WETHERBEE . . . 777 Cass Ave., Detroit, Mich.	II.	Ship Draughtsman.
SALMON W. WILDER, JR. . . Bellows Falls, Vt.	X.	With Fall Mountain Paper Co.
FRED A. WILSON . . . Nahant, Mass.	II.	With J. T. Wilson, Building Contractor.
CHARLES H. WOOD . . . 45 Milk St., Boston.	II.	Clerk, International Trust Co.

## 1892.

CHARLES A. BEAL . . . Harrison, N. J.	VI.	With General Electric Co. Incandescent Lamp Works.
ALICE H. BECKLER . . . 1414 Pine St., Philadelphia, Pa.	VII.	Assistant in Biology, Philadelphia Normal School.
CHARLES H. BIGELOW . . . 8 Broad St., Salem, Mass.	VI.	Inspector of Power Stations, West End Street Ry. (Boston).
PHILLIPS PAYSON BOURNE . . . Cambridgeport, Mass.	II.	With The George F. Blake Manufacturing Co.
STEPHEN BOWEN . . . South Boston, Mass.	II.	With Whittier Machine Co.
BERTHA MILLARD BROWN . . . 16 Holborn St., Roxbury, Mass.	VII.	
PHILIP M. BURBANK . . . 132 Church St., Waltham, Mass.	VI.	First Assistant in Office of City Engineer.

1892. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
CHARLES M. BURNHAM . . . 36 Beach St., Waltham, Mass.	VI.	With American Waltham Watch Co.
GUY J. BURNHAM . . . . . Fitchburg, MASS.	X.	With Parkhill Manufacturing Co.
HARRY A. BURNHAM . . . . . Passaic, N. J.	II.	Mechanical Superintendent, Passaic Print Works.
SEVERANCE BURRAGE . . . . . La Fayette, Ind.	VII.	Instructor in Sanitary Science, Purdue University.
HUBER D. CARD . . . . . 6 Murray Block, Willimantic, Conn.	XII.	Surveyor; Superintendent of City Sewer Construction.
DOUGLAS A. CATER, M.D. . . . . New York, N. Y.	II.	Physician, Post Graduate Hospital.
CHARLES H. CHASE . . . . . Tufts College, Mass.	VI.	Instructor in Shopwork, Tufts College.
RICHARD D. CHASE . . . . . 15 Monroe Pl., Brooklyn, N. Y.	XI.	Assistant Sanitary Engineer, Department of Health, City of Brooklyn.
ALBERT K. CHURCH . . . . . McKeesport, Pa.	V.	With National Tube Works Co.
LEWIS P. CODY . . . . . 9 So. Division St., Grand Rapids, Mich.	VI.	President and Treasurer, Grand Rapids Electric Co.
CHARLES P. COGSWELL, JR. . . . . New Haven, Conn.	I.	With New York, New Haven, & Hartford R. R. Co.
JOHN M. COLBY, JR. . . . . Second St., Everett, Mass.	II.	Superintendent's Assistant, Norton Iron Co.
JOSHUA CRANE, JR., A.B. . . . . Tremont Bldg., Boston.	VI.	Electrical Expert and Consulting Engineer.
JOHN A. CURTIN . . . . . Tremont Bldg., Boston.	I.	Attorney-at-law.
GEORGE E. DADMUN, A.B. . . . . 220 Devonshire St., Boston.	II.	With Cumberland Manufacturing Co. Warren Filters.
GORHAM DANA . . . . . 93 Water St., Boston.	I.	Inspector, The Underwriters' Bureau of New England.
RAUL R. DE CARVALHO . . . . . Amparoda Barra Mansa, Rio de Janeiro, Brazil.	IX.	Coffee Planter.
W. HARTLEY DENNETT . . . . . 31 State St., Boston.	IV.	Architect.
LOUIS DERR, M. A. . . . . Boston, Mass.	VI.	Instructor in Physics, Mass. Institute of Technology.
MARGARET E. DODD . . . . . Boston, Mass.	VII.	Graduate Student, Mass. Institute of Technology.
WALTER B. DOUGLASS . . . . . Second St., East Everett, Mass.	I.	Engineer, Norton Iron Co.
HENRY C. DRESSER . . . . . Charlotte, N. C.	II.	With Charlotte Machine Co., Cotton Machinery.

1892. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
BARRON P. DU BOIS . . . .	VI.	Assistant Paymaster, U. S. N. Care Navy Pay Office, U. S. S. Albatross, San Francisco, Cal.
GEORGE F. ELDRIDGE, . . .	V.	With Embreeville Iron Estate. Embreeville, Tenn.
SUMNER B. ELY . . . . .	II.	With Harrisburg Foundry and Machine Works (Harrisburg, Pa.). 11 W. Eighty-eighth St., New York, N. Y.
LOGAN FELAND . . . . .	IV.	Architect. Owensboro', Ky.
HENRY A. FISKE . . . . .	VI.	(See Class of 1891.)
HOWARD C. FORBES . . . .	VI.	(See Class of 1891.)
GAYLE T. FORBUSH . . . .	X.	Special Agent, German American Insur- ance Co. 30 Kilby St., Boston.
FREDERICK L. FRANCIS . . .	IV.	With H. M. Francis, Architect. Fitchburg, Mass.
ALLEN FRENCH . . . . .	IX.	Student. 200 Commonwealth Ave., Boston.
EDWARD R. FRENCH . . . .	VI.	Electrician, Suburban Electric Co. 75 Murray St., Elizabeth, N. J.
CHARLES E. FULLER . . . .	II.	Instructor in Mechanical Engineering, Mass. Institute of Technology. Boston, Mass.
EDWARD P. GILL . . . . .	IV.	In Lumber Business. P. O. Box 626, Baltimore, Md.
HOWARD GILMORE . . . . .	II.	Manufacturer, Gilmore Electrical and Manufacturing Co. North Easton, Mass.
GEORGE H. GOODELL . . . .	II.	Mechanical Engineer, Erie R. R. Co. Susquehanna, Pa.
WILLIAM P. GRAY . . . . .	VI.	8 So. Fifth St., Richmond, Va.
WILLIAM W. GREEN . . . .	I.	Assistant Engineer, Street Department, City Hall, Chicago, Ill.
CHARLES B. GRIMES . . . .	V.	Superintendent, Western Factory and Office, Carter, Dinsmore, & Co., Ink Manufacturers. Chicago, Ill.
EDWARD C. HALL, JR. . . .	II.	Mechanical and Mining Engineer. Mine Centre, Ont., and Rainy Lake, Minn.
HARRY A. HARWOOD . . . .	I.	With Harwood Brothers. 386 Washington St., Boston.
ALBERT S. HEYWOOD . . . .	VI.	Local Engineer, General Electric Co. 420 W. Fourth St., Cincinnati, Ohio.
JOHN D. HILLIARD, JR. . . .	VI.	Electrical Engineer. Provincetown, Mass.



1892. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
FRANCIS C. HOLMES . . . North Plymouth, Mass.	IX.	With Plymouth Cordage Co.
PRESCOTT A. HOPKINS, S.M. Philadelphia, Pa.	IV.	Assistant Professor of Architecture, Drexel Institute.
FREDERICK J. HOXIE . . . Phenix, R. I.	VI.	President, Hoxie Bros. Co.
W. SPENCER HUTCHINSON . . . 44 Morton St., Mattapan, Mass.	III.	
GEORGE H. INGRAHAM . . . 6 Beacon St., Boston.	IV.	Architect.
ARTHUR L. JACOBS . . . Old Court House, Boston.	VI.	Deputy Inspector, Wire Department, City of Boston.
JESSE F. JOHNSON . . . Montreal, Que.	X.	With Hamilton Powder Co.
WILLIAM A. JOHNSTON . . . Boston, Mass.	II.	Instructor in Mechanical Engineering, Mass. Institute of Technology.
WILLIAM R. KALES . . . Cleveland, Ohio.	II.	Draughtsman, Brown Hoisting and Con- veying Machine Co.
WILLIAM R. KENDALL . . . 307 Delaware St., Kansas City, Mo.	VI.	Vice-President, William W. Kendall Boot and Shoe Co.
ARMAND D. KOCH . . . Care Munroe & Co., 7 Rue Scribe, Paris, France.	IV.	Student, École des Beaux-Arts.
WILLIAM H. LANE . . . 16 Smith St., Brooklyn, N. Y.	VI.	Engineer, New York and New Jersey Telephone Co.
ELISHA LEE, JR. . . . . Port-of-Spain, Trinidad, W. I.	I.	
WILLIAM W. LOCKE . . . 40 Clinton St., Brooklyn, N. Y.	XI.	Sanitary Engineer, Department of Health, City of Brooklyn.
JOSEPH B. LUKES . . . 139 Adams St., Chicago, Ill.	VI.	Inspector, Chicago Edison Co.
JOSEPH P. LYON . . . . . 21 Cortlandt St., New York, N. Y.	I.	Assistant Engineer, Erie R. R.
ELMER G. MANAHAN . . . 3 Mt. Vernon St., Boston.	XI.	Assistant, Metropolitan Water Board.
LAURENCE B. MANLEY . . . 116 Mt. Vernon St., West Roxbury, Mass.	I.	Assistant Engineer, Boston Transit Com- mission. (20 Beacon Street.)
R. HERBERT MANSFIELD, JR. Hoboken, N. J.	VI.	Secretary and Treasurer, Ward Leonard Electric Co.; Secretary and Treasurer, Carpenter Enamel Rheostat Co.
ALBERT P. MATHEWS . . . Care Brown, Shipley & Co., London, England.	VII.	Studying abroad.
GEORGE H. MAY . . . . . Newton Lower Falls, Mass.	V.	Chief Chemist and Superintendent of Works, Billings, Clapp, & Co.

1892. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
WALLACE E. MCCAW . . . .	VI.	President, Georgia Mills and Elevator Co. Macon, Ga.
GEORGE A. MERRILL . . . .	XI.	With L. M. Hastings, City Engineer. City Hall, Cambridge, Mass.
WILLIAM H. MESSENGER . . .	II.	With De La Vergne Refrigerating Machine Co. E. One-hundred-and-thirty-eighth St., New York, N. Y.
LEONARD METCALF . . . . .	I.	Professor of Mathematics and Engineering, Massachusetts Agricultural College; Meteorologist, Hatch Experiment Station. Amherst, Mass.
HERBERT S. MILLER . . . . .	VI.	Secretary and Electrical Engineer, Diehl Manufacturing Co. 1025 E. Jersey St., Elizabeth, N. J.
LILLY MILLER . . . . .	V.	Assistant Chemist, Mass. State Board of Health. Medford, Mass.
HERBERT R. MOODY . . . . .	V.	Instructor in Science, Gilbert School. Winsted, Conn.
FREDERICK CAMPBELL MOORE .	X.	Insurance Inspector, Factory Insurance Association. 95 Pearl St., Hartford, Conn.
ASA HALL MORRILL . . . . .	I.	Assistant Roadmaster, Worcester Division, New York, New Haven, & Hartford R.R. Woonsocket, R. I.
WALTER M. NEWKIRK . . . . .	II.	Engineer, with Smith & Conant, Consulting Mechanical and Electrical Engineers. 36 Moffat Block, Detroit, Mich.
FRANK E. NEWMAN . . . . .	IV.	With Frank Miles Day & Bro., Architects. 925 Chestnut St., Philadelphia, Pa.
ARTHUR J. OBER . . . . .	I.	Assistant with City Engineer, Cambridge, Mass., on Hobbs Brook Storage Basin. West Medford, Mass.
HAMILTON OTIS . . . . .	I.	Rancher. Cazadero, Sonoma Co., Cal.
CHARLES F. PARK . . . . .	II.	Instructor in Mechanical Engineering, Mass. Institute of Technology. Boston, Mass.
J. SCOTT PARRISH . . . . .	II.	Acting Treasurer, Richmond Cedar Works; Secretary, Gulf Red Cedar Co. Richmond, Va.
FRANK EDSON PERKINS . . . .	IV.	Student, École des Beaux-Arts. 9 Rue de Medicis, Paris, France.
JOHN C. PERRY . . . . .	II.	With Bates Machine Co. 1000 Cass St., Joliet, Ill.
HENRY M. PHILLIPS . . . . .	VI.	Electrical Engineer, Yale Lock Manufacturing Co. 23 Bell St., Stamford, Conn.
ARTHUR G. PIERCE . . . . .	VI.	Engineer, Edison Electric Illuminating Co. of Boston. 3 Head Pl., Boston.
ARTHUR W. PIERCE . . . . .	VI.	In charge of Electric Plant for the Goodell Co. (Antrim, N. H.). P.O. Box 168, Bennington, N. H.

1892. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
MACY S. POPE . . . . . 31 Milk St., Boston.	I.	Inspector, Factory Mutual Fire Insurance Cos.
DANA M. PRATT . . . . . Brookline, Mass.	I.	With French & Bryant, Civil Engineers.
ARTHUR G. RANLETT . . . . . Brown's Valley, Yuba Co., Cal.	III.	With Webb Gold Mining Co.
FREDERICK L. RHODES . . . . . 42 Farnsworth St., South Boston, Mass.	VI.	With American Bell Telephone Co.
ANDREW R. ROBERTSON . . . . . 8 Park Circus Pl. Glasgow, Scotland.	II.	With Messrs. Watson, Laidlaw, & Co., Engineers.
DWIGHT P. ROBINSON, A.B. . . . . 308 No. Summer St., Nashville, Tenn.	VI.	Representing Stone & Webster, Electrical Experts and Engineers (Boston).
WILLIAM M. ROSEWATER . . . . . 330 Woodland Ave., Cleveland, Ohio.	II.	Draughtsman, The Brown Hoisting and Conveying Machine Co.
GEORGE F. ROWELL . . . . . 38 Clinton St., Brooklyn, N. Y.	I.	Assistant Sanitary Engineer, Health De- partment, City of Brooklyn.
HORACE F. RUGGLES . . . . . 35 Broad St., Boston.	II.	
WARD M. SACKETT, C.E. . . . . 203 Washington St., Chicago, Ill.	VI.	With Chicago Telephone Co.
HENRY J. SAGE, B.A. . . . . Rochester, Pa.	VI.	Electrical Engineer.
OSCAR F. SAGER . . . . . Brockton, Mass.	II.	Teacher of Manual Training, Brockton High School.
ALBERT F. SARGENT, JR. . . . . 425 Main St., Malden, Mass.	I.	With A. F. Sargent, Civil Engineer, Sur- veyor, and Conveyancer.
RUSSELL SELFRIDGE . . . . . 137 W. Fifty-seventh St., New York, N. Y.	IX.	
FRANK C. SHEPHERD . . . . . 20 Beacon St., Boston.	XI.	Assistant Engineer, Boston Transit Com- mission.
LE ROY K. SHERMAN . . . . . 225 So. Leavitt St., Chicago, Ill.	I.	Assistant Engineer, Chicago Sanitary Drainage Canal.
HARRY D. SHUTE . . . . . Pittsburgh, Pa.	VI.	With Westinghouse Electric and Manu- facturing Co.
THEODORE H. SKINNER . . . . . 160 Fifth Ave., New York, N. Y.	IV.	With McKim, Mead, & White, Architects.
ARTHUR C. SMITH . . . . . Waltham, Mass.	V.	With W. E. Bright.
HENRY P. SPAULDING . . . . . 25 Beacon St., Boston.	VI.	Artist.

1892. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
RALPH H. SWEETSER . . . Everett, Pa.	III.	Assistant Superintendent, Everett Furnace.
GEORGE P. TALLANT . . . Tallac, Lake Tahoe, Cal.	IX.	
ROBERT R. TAYLOR . . . Tuskegee, Ala.	IV.	Teacher, Tuskegee Normal and Industrial School.
WILLIAM C. THALHEIMER . . 134 St. Botolph St., Boston.	I.	With Norton Iron Co.
WALTER B. TROWBRIDGE . . 125 Kingston St., Boston.	II.	Treasurer and General Manager, Eppler Welt Machine Co.
ROSS F. TUCKER . . . . . 136 Fifth Ave., New York, N. Y.	IV.	Manager, Manhattan Concrete Co.
GEORGE W. VAILLANT . . . . 1 Broadway, New York, N. Y.	III.	With Mannesmann Tube Co.
JOHN F. VINING . . . . . South Weymouth, Mass.	IV.	Architect.
THOMAS C. WALES, JR. . . . 42 Farnsworth St., South Boston, Mass.	VI.	With American Bell Telephone Co.
FRANCIS WALKER, Ph.D. . . . Colorado Springs, Colo.	IX.	Instructor in Political Science, Colorado College.
CHARLES F. WALLACE . . . . 4 Post-Office Sq., Boston.	VI.	With Stone & Webster, Electrical Experts and Engineers.
MURRAY WARNER . . . . . 1490 Old Colony Bldg., Chicago, Ill.	II.	Engineer, New England Engine Co.
JOSEPH A. WARREN . . . . . Cumberland Mills, Me.	XI.	With S. D. Warren & Co.
CHARLES C. WATERMAN . . . . 153 Cedar St., New York, N. Y.	VI.	Assistant Electrician, American Telephone and Telegraph Co.
RICHARD WATERMAN, JR. . . . 164 Dearborn St., Chicago, Ill.	IX.	Secretary, Educational Committee, Civic Federation.
HENRY S. WEBB . . . . . South Bethlehem, Pa.	VI.	Instructor in Electrical Engineering, Lehigh University.
EDWARD C. WELLS . . . . . 3 Wells Bldg., Quincy, Ill.	II.	With Wells & Adams, Real Estate Loans.
GEORGE V. WENDELL . . . . . 4 Haydn str., Leipzig, Germany.	VIII.	Studying abroad.
FRANK T. WESTCOTT, B.P. . . . No. Attleboro, Mass.	I.	Civil Engineer.
ARTHUR M. WORTHINGTON . . . Harrison Ave., Boston.	VII.	Medical House Officer, Boston City Hospital.

1893.

NAME AND ADDRESS.	COURSE.	OCCUPATION.
FREDERIC B. ABBOTT . . . 78 Sagamore St., Lynn, Mass.	VI.	Of F. B. Abbott Co., Shoe Manufacturers.
ORTON W. ALBEE . . . Newark, N. J.	III.	With Benjamin, Atha & Illingsworth Co.
HERBERT W. ALDEN . . . Lynn, Mass.	II.	With American Projectile Co.
CHARLES V. ALLEN . . . 311 Linden Ave., Pittsburgh, Pa.	VI.	With Westinghouse Electric and Manufacturing Co.
JOHN G. ANTHONY . . . Great Falls, Mont.	III.	Assistant Chemist, Boston & Montana Copper Co.
FRANK S. BADGER . . . 66 Broadway, Lowell, Mass.	I.	With Proprietors of the Locks and Canals on Merrimack River.
FREDERIC W. BAKER . . . 149 A Tremont St., Boston.	II.	
HETTY O. BALLARD . . . Colorado Springs, Colo.	XII.	
MINARD T. BARBOUR . . . 348 Ashland Boulevard, Chicago, Ill.	II.	With Crane Elevator Co. (219 Jefferson St.).
WILLIAM T. BARNES . . . East Freetown, Mass.	I.	With George S. Rice & George E. Evans, Civil and Hydraulic Engineers (95 Milk St., Boston).
ROY H. BEATTIE . . . 422 No. Main St., Fall River, Mass.	I.	Contractor.
ALBERT F. BEMIS . . . 89 State St., Boston.	I.	With Bemis Brother Bag Co.
MAURICE B. BISCOE . . . 53 State St., Boston.	IV.	Draughtsman with Peabody & Stearns, Architects.
EDMUND E. BLAKE . . . 204 So. Tryon St., Charlotte, N. C.	II.	With Charlotte Machine Co.
GROSVENOR TARBELL BLOOD . . . 125 Milk St., Boston.	VI.	With American Bell Telephone Co.
SAMUEL N. BRAMAN . . . Wayland, Mass.	II.	With Motive Power Department, Boston & Maine R. R.
JOHN CLIFFORD BROWN . . . 18 Cortlandt St., New York, N. Y.	VI.	With Metropolitan Telephone and Telegraph Co.
ERNEST C. BRYANT, B.S. . . .	I.	Professor of Physics and Mathematics, Middlebury College.
LEONARD B. BUCHANAN . . . 161 High St., Boston.	VI.	With Stone & Webster, Electrical Experts and Engineers.
CHARLES E. BUCHHOLZ . . . Watertown, N. Y.	I.	Inspector of Masonry, Rome, Watertown, & Ogdensburg R. R.
ARTHUR A. BUCK . . . Washington, D. C.	VI.	Third Assistant Examiner, U. S. Patent Office.

1893. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
JOHN R. BURKE . . . . 65 Bowdoin St., Boston.	I.	With Board of Harbor and Land Commissioners of Massachusetts.
DENNIS E. CALLAHAN . . . 710 Albany St., Boston.	VI.	Superintendent, Third District, Eastern Division, Boston Water Department.
EDWARD B. CARNEY . . . . Plymouth St., Lowell, Mass.	II.	With City Engineer.
WILLIAM W. CARTER . . . . Care C. N. Carter, Dedham, Mass.	X.	Electrical and Chemical Engineer, for Jobbins & Van Ruymbeke (Aurora, Ill.).
HARRY L. CLAPP . . . . . Washington, D. C.	X.	Assistant Examiner in U. S. Patent Office.
WILFRED A. CLAPP . . . . . 24 Salcombe St., Dorchester, Mass.	I.	With Metropolitan Water Board (at Northborough, Mass.).
JOHN S. CODMAN, A.B. . . . 57 Marlborough St., Boston.	VI.	With American Bell Telephone Co. (42 Farnsworth St.).
CHARLES NOURSE COOK . . . Providence, R. I.	X.	With Silver Spring Bleaching and Dyeing Co.
NATHANIEL R. CRAIGHILL . . Raleigh, N. C.	II.	Professor of Mechanical Engineering, North Carolina College of Agriculture and Mechanic Arts.
WILLIAM W. CROSBY . . . . Mt. Vernon St., Lowell, Mass.	II.	Superintendent, Otis Allen & Son.
COURTLAND R. DARROW . . . 70 Linden St., Waterbury, Conn.	I.	With W. G. Smith, Civil Engineer.
ALBERT G. DAVIS . . . . . Washington Loan & Trust Bldg., Washington, D. C.	VI.	Electrical Expert and Solicitor of Patents.
CARLETON E. DAVIS . . . . . 95 Milk St., Boston.	I.	With George S. Rice & George E. Evans, Civil and Hydraulic Engineers.
HERBERT N. DAWES . . . . . 451 Atlantic Ave., Boston.	II.	With S. C. Nightingale & Childs, Magnesia Pipe and Boiler Covering and Road Building Machinery.
GEORGE K. DEARBORN . . . . 105 Quincy St., Chicago, Ill.	IX.	Chief Operator, American Telephone and Telegraph Co.
CHARLES D. DEMOND . . . . . Boston, Mass.	III.	Assistant to Prof. Richards, Massachusetts Institute of Technology.
EDWARD D. DENSMORE . . . . 3 Hamilton Pl., Boston.	VI.	With Hollis French, Consulting Engineer.
FREDERICK N. DILLON . . . . Fitchburg, Mass.	V.	With D. M. Dillon, Boiler Manufacturer.
LAURENCE B. DIXON . . . . . 242 So. Jefferson St., Chicago, Ill.	VI.	With Western Electric Co.
SAMUEL D. DODGE . . . . . Arlington, Mass.	I.	With Massachusetts Metropolitan Water Board.

1893. — *Continued.*

NAME AND ADDRESS.	COURSE	OCCUPATION.
PETER F. DOLAN . . . . .	VI.	Electrical Engineer, Wire Department, 185 Chelsea St., East Boston. City of Boston (Old Court House).
THEODORE T. DORMAN . . . . .	X.	Assistant Examiner, U. S. Patent Office. Washington, D. C.
JAMES A. EMERY . . . . .	I.	With William Wharton, Jr., & Co. Washington Ave., Philadelphia, Pa.
WILLIAM ESTY, M.A. . . . .	VI.	Assistant Professor of Electrical Engineering, University of Illinois. California Ave., Urbana, Ill.
ARTHUR FARWELL . . . . .	VI.	Teacher of Harmony and Composition. 38 St. Botolph St., Boston.
FREDERIC H. FAY, S.M. . . . .	I.	With Engineering Department, City of Boston. 65 City Hall, Boston.
FRED B. FORBES . . . . .	V.	Assistant Chemist, Lawrence Experiment Station, Mass. State Board of Health. Lawrence, Mass.
ARTHUR E. FOWLE . . . . .	X.	With Boston Bridge Works. 70 Kilby St., Boston.
WALTER L. FRISBIE . . . . .	II.	Reading Patent Law. 73 Lake Pl., New Haven, Conn.
WILLIAM BURT GAMBLE . . . . .	IX.	Mining. Colorado Springs, Colo.
WALLACE K. GAYLORD . . . . .	V.	Instructor in Chemistry, Throop Polytechnic Institute. 146 Terrace Drive, Pasadena, Cal.
HOWARD GILMORE . . . . .	VI.	(See Class of 1892.)
MARVINE GORHAM . . . . .	II.	With Plumb, Burdick, & Barnard, Nut and Bolt Manufacturers. White Bldg., Buffalo, N. Y.
FREDERICK W. HADLEY . . . . .	VI.	With West End Street Ry. Co. (Boston). Arlington Heights, Mass.
EDW. MCKIM HAGAR, M.M.E. . . . .	II.	Manager, Chicago Office, Southwark Foundry and Machine Co. of Philadelphia. 554 The Rookery, Chicago, Ill.
GEORGE T. HANCHETT . . . . .	VI.	Associate Editor, Electrical World. 253 Broadway, New York, N. Y.
FREDERIC H. HARVEY . . . . .	III.	Managing the Estate of the late O. Harvey, M.D.; of Harvey & Hutchinson, Mining Engineers and Metallurgists. Galt, Sacramento Co., Cal.
J. FRED. HINCKLEY . . . . .	X.	Chemist and Overseer of Glycerine Plant, for C. Lipps, Soap Manufacturer. Baltimore, Md.
WILLIAM G. HOUCK . . . . .	I.	Structural Engineer, Bureau of Buildings, Department of Public Works. 42 Delaware Ave., Buffalo, N. Y.
FREDERICK H. HOWLAND . . . . .	IX.	Washington Correspondent, Providence Journal. Providence, R. I.
DANIEL D. JACKSON . . . . .	V.	Assistant Biologist, Mass. State Board of Health; Lecturer on Microscopical Examination of Water Supplies, Mass. Institute of Technology. 525 Boylston St., Boston.

1893. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
LAWRENCE S. JAMES . . . 32 Hawley St., Boston.	V.	Assistant State Inspector of Illuminating Gas and Gas Meters.
ARTHUR H. JAMESON . . . South Chicago, Ill.	V.	Chemist, Cleveland Linseed Oil Co.
SIMEON C. KEITH, JR. . . 8 No. Market St., Boston.	VII.	Bacteriologist, O. Douglass & Co., Lecturer on Industrial Biology, Mass. Institute of Technology.
ERVIN KENISON . . . . . Boston, Mass.	II.	Instructor in Mechanical Drawing and Descriptive Geometry, Mass. Institute of Technology.
FREDERIC H. KEYES . . . . . Boston, Mass.	II.	Instructor in Mechanical Engineering, Mass. Institute of Technology.
WARREN D. KING . . . . . Peabody, Mass.	VI.	Electrical Engineer, Broad Cove Coal Co. (Limited) (Mason Bldg., Boston).
WILLIS T. KNOWLTON . . . . . 60 Cedar St., Malden, Mass.	I.	Assistant, City Engineer's Office, Medford, Mass.
WILLIAM F. LAMB . . . . . 26 Seventh Ave., Pittsburgh, Pa.	VI.	With American Telephone and Telegraph Co.
WALLACE C. LAMBERT . . . . . 70 Kilby St., Boston.	I.	With Boston Bridge Works.
HARRY N. LATEY . . . . . 3625 Finney Ave., St. Louis, Mo.	VI.	With Westinghouse Electric and Manufacturing Co.
HARRY M. LATHAM . . . . . Newark, N. J.	II.	With Crocker-Wheeler Electric Co.
HERBERT LEWIS, M.A. . . . . Washington, D. C.	VI.	Assistant Examiner, U. S. Patent Office.
JOHN W. LOGAN . . . . . Bala, Pa.	II.	With Pennsylvania Iron Works Co. (Philadelphia).
HEIICHIRO MAKI . . . . . 39 Washio St., Kioto, Japan.	VI.	Chief Electrical Engineer, Kioto Traction Co.
WILLARD A. MARCY . . . . . Newton Upper Falls, Mass.	II.	With Pettee Machine Co.
GEORGE E. MCQUESTEN . . . . . 27 Kilby St., Boston.	VI.	In Business.
FRANK H. MERRILL . . . . . P. O. Box 422, Aurora, Ill.	X.	With Jobbins & Van Ruymbeke, Patentees of New Process for Glycerine Distillation.
BENJAMIN M. MITCHELL . . . . . Passaic, N. J.	II.	Mechanical Engineer, Manhattan Rubber Co.
HENRY A. MORSS . . . . . 79 Cornhill, Boston.	VI.	With Morss & Whyte, Wire Workers.
HENRY W. NICHOLS . . . . .	XII.	Curator, Department of Economic Geology, Field Columbian Museum, Chicago, Ill.
CHARLES L. NORTON . . . . . Boston, Mass.	VI.	Instructor in Physics, Mass. Institute of Technology.
FRANCIS C. NORTON . . . . . Rockland, Me.	IX.	With Francis Cobb & Co.



1893. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
CHARLES L. NUTTER . . . . East Bridgewater, Mass.	II.	Mechanical Engineer, Carver Cotton-Gin Co.
CECIL E. PAINE . . . . . Bath, Me.	II.	With Bath Iron Works.
JOSEPH Y. PARCE, JR. . . . . Denver, Colo.	II.	Teacher, Manual Training High School.
OREN E. PARKS . . . . . 82 No. Elm St., Westfield, Mass.	I.	Town Engineer.
HARRY M. PHILLIPS . . . . . 51 Leonard St., New York, N. Y.	II.	
LEO W. PICKERT . . . . . Granite St., South Boston.	V.	Assistant Chemist, American Sugar Refining Co.
JAMES H. REED, JR. . . . . 124 Pearl St., Boston.	VI.	Wid. National Sewing Machine Co.
WILLIAM S. RESOR . . . . . 314 Vine St., Cincinnati, Ohio.	VI.	Inspector, American Telephone and Telegraph Co.
HARRY L. RICE . . . . . Milwaukee, Wis.	X.	Superintendent of Distribution, Milwaukee Gas Light Co.
FRANK D. RICHARDSON . . . . . 18 Cortlandt St., New York, N. Y.	II.	With American Telephone and Telegraph Co.
HAROLD A. RICHMOND . . . . . Norway St., Boston.	II.	Treasurer and General Manager, "The Ball Bearing Co."
FENWICK F. SKINNER . . . . . Boston, Mass.	I.	In City Engineer's Office, Park Department, City of Boston.
A. BLAKELEY SMITH . . . . . 24 Davis St., Providence, R. I.	IX.	With Albert W. Smith, Dealer in Foreign and Domestic Wools.
FREDERICK D. SMITH . . . . . 25 Waverly St., Malden, Mass.	I.	Assistant Engineer, Metropolitan Sewerage Commission.
JOHN I. SOLOMON . . . . . 59 E. One-hundred-and-eleventh St., New York, N. Y.	VI.	In Business.
J. RAMSEY SPEER . . . . . Pittsburgh, Pa.	II.	Manager, Blast Furnace Department, Shoenberger Steel Co.
CHARLES M. SPOFFORD . . . . . Boston, Mass.	I.	Assistant in Civil Engineering, Mass. Institute of Technology.
GEORGE W. STOSE . . . . . Washington, D. C.	I.	Assistant Geologist, U. S. Geological Survey.
LOVELL BAKER STOWE . . . . . Y. M. C. A. Bldg., Burlington, Vt.	VI.	With New England Telephone and Telegraph Co.
FRED B. STUDLEY . . . . . North Duxbury, Mass.	VI.	Mission Work.
FREDERICK C. SUTTER . . . . . Pittsburgh, Pa.	VI.	With Westinghouse Electric and Manufacturing Co.
WALTER I. SWANTON . . . . . Kneeland St., Boston.	I.	Bridge Inspector, Boston & Albany R. R. Co.

1893. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
KILBURN S. SWEET . . . Boston, Mass.	I.	Instructor in Civil Engineering, Mass. Institute of Technology.
CHARLES WILSON TAINTOR 125 Milk St., Boston.	VI.	With New England Telephone and Telegraph Co.
CHARLES M. TAYLOR . . . Weymouth Heights, Mass.	II.	
WINTHROP P. TENNEY . . . 85 Water St., Boston.	VI.	With Scull & Field, Insurance.
ALFRED C. THOMAS . . . 18 Cortlandt St., New York, N.Y.	VI.	With Metropolitan Telephone and Telegraph Co.
PERCY H. THOMAS . . . . East Pittsburgh, Pa.	VI.	With Westinghouse Electric and Manufacturing Co.
WINTHROP L. TIDD . . . . Taunton, Mass.	II.	With Oakland Mills.
JOHN F. TOMFOHRDE . . . 24 Mt. Vernon St., Charlestown, Mass.	II.	Counsellor-at-law.
CHARLES A. TRIPP . . . . P. O. Box 5, Hudson, Mass.	VI.	Manufacturer of Electrical Machinery and Apparatus, Hudson Electric Manufacturing Co.
WILLIAM A. TUCKER . . . Lake Linden, Mich.	III.	With Calumet & Hecla Mining Co.
LOUIS B. VINING . . . . 534 Columbus Ave., Boston.	VI.	With Gamewell Fire Alarm Telegraph Co. (Newton Upper Falls, Mass.).
A. B. WADSWORTH, M.D. 44 New St., New York, N. Y.	VII.	Physician.
S. PAYSON WALDRON . . . 70 Kilby St., Boston.	I.	With Boston Bridge Works.
CHARLES R. WALKER . . . Boston, Mass.	V.	Assistant in General Chemistry, Mass. Institute of Technology.
GEORGE L. WALKER, B.S. 890 Grand Boulevard, New York, N. Y.	I.	Master Mechanic, Street Cleaning Department, New York City.
FREDERIC A. WALLACE . . . Lawrence, Mass.	II.	Chief Engineer, Pacific Mills.
ROBERT N. WALLIS . . . Fitchburg, Mass.	IX.	Treasurer, Fitchburg & Leominster St. Ry.
HARRY C. WATERMAN . . . 55 Kilby St., Boston.	IV.	Draughtsman with J. Williams Beal, Architect.
S. EDGAR WHITAKER, A.M. 58 Oliver St., Fitchburg, Mass.	VI.	Electrical Contractor.
PARKER H. WILDER . . . Neave Building, Cincinnati, Ohio.	VI.	Agent.

1893. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
JONATHAN E. WOODBRIDGE 311 E. Third St., Duluth, Minn.	VI.	Electric Engineer (68 W. Forty-ninth St., New York, N. Y.).
HENRY T. WOODS . . . . 31 State St., Boston.	II.	With Sturtevant, Norton & Co., Wholesale Coal Dealers.
GEORGE M. YORKE . . . . 105 Quincy St., Chicago, Ill.	VI.	With American Telephone and Telegraph Co.

## 1894.

CHARLES G. ABBOT, S.M. Washington, D. C.	VIII.	Aid Acting in Charge, Astrophysical Observatory, Smithsonian Institution.
RALEIGH B. ADAMS . . . . 2 Gleason St., Dorchester, Mass.	X.	With Boston Belting Co.
GEORGE H. ANDERSON . . . . Julien House, Belvidere, Ill.	X.	
EDMUND L. ANDREWS . . . . 105 Quincy St., Chicago, Ill.	VI.	Inspector, American Telephone and Telegraph Co.
FRED C. BAKER . . . . . 107 Adams St., Waltham, Mass.	II.	Draughtsman, The George F. Blake Manufacturing Co. (East Cambridge).
GEORGE E. BARSTOW . . . . 416 Union St., Lynn, Mass.	II.	Designer for E. E. Winkley & Co., Mechanical Engineers.
HOWARD R. BARTON . . . . 153 Cedar St., New York, N. Y.	VI.	With American Telephone and Telegraph Co.
HARRY R. BATES . . . . . North Weymouth, Mass.	V.	Chemist, Bradley Fertilizer Co.
WALTER V. BATSON . . . . . 37 Vine St., Lynn, Mass.	VI.	In Testing Department, General Electric Co.
CHARLES BURR BEACH . . . . 1183 Locust St., Dubuque, Iowa.	X.	Chemical Engineer, J. Beach & Sons, Soap Manufacturers.
IRVING EVERETT BEACH . . . . Lawrence, Mass.	V.	Of Beach Soap Co.
NORWIN S. BEAN . . . . . 23 Prospect St., Manchester, N. H.	VI.	With Second National Bank.
VALLETTE L. BENEDICT . . . . 722 Union St., Schenectady, N. Y.	VI.	With General Electric Co.
HEREFORD BERRY . . . . . North Andover, Mass.	VI.	
GROSVENOR T. BLOOD, S.B.	II.	(See Class of 1893.)
CHARLES R. BOSS . . . . . 34 Broad St., New London, Conn.	IX.	Manufacturer.
WILLIAM H. BOVEY . . . . . 12 So. Thirteenth St., Minneapolis, Minn.	VI.	With Washburn-Crosby Co., Merchant Millers.

## 1894.—Continued.

NAME AND ADDRESS.	COURSE.	OCCUPATION.
S. ALEC BREED . . . . . 9 Portland St., Lynn, Mass.	II.	Superintendent of Mill, S. N. Breed & Co.
WALTER V. BROWN . . . . . 19 W. Twenty-first St., New York, N. Y.	VI.	With Pattison Bros., Electrical Engineers.
WILLIAM W. CARTER, S.B.	VI.	(See Class of 1893.)
MASON S. CHACE . . . . . Care of "Crédit Lyonnais," Paris, France.	II.	Travelling.
JOHN WINSLOW CHAPMAN, JR. 240 Lansel St., Hartford, Conn.	II.	Draughtsman, Pope Manufacturing Co.
NATHAN C. W. CHAPMAN . . . . . 19 Franklin St., Providence, R. I.	II.	Draughtsman, Brown & Sharpe Manufacturing Co.
HAROLD M. CHASE . . . . . 401 So. Front St., Wilmington, N. C.	X.	In charge of Dyeing Department, Wilmington Cotton Mills.
ALAN A. CLAFLIN . . . . . Littleton, Mass.	V.	Superintendent, Avery Chemical Co.
EDWARD D. CLARKE . . . . . 249 Linwood Ave., Buffalo, N. Y.	VI.	With Plumb, Benedict, & Barnard, Nut and Bolt Manufacturers.
FRED H. CLARKE . . . . . City Hall, Boston.	I.	With City Engineer, City of Boston.
ARTHUR A. CLEMENT . . . . . Produce Exchange, New York, N. Y.	X.	Chemist, W. J. Wilcox Lard and Refining Co. (Guttenberg, N. J.).
PRESCOTT H. COOLIDGE . . . . . Carmel, N. Y.	I.	With Croton Aqueduct Commission (New York, N. Y.).
HENRY F. COPELAND . . . . . 357 W. Fortieth St., New York, N. Y.	I.	Member of Firm, Rodda Piano Co.
NATHANIEL R. CRAIGHILL, S.B.	VI.	(See Class of 1893.)
HORACE A. CRARY . . . . . Sheffield, Warren Co., Pa.	I.	With Horton Crary & Co., Petroleum and Natural Gas Producers.
CHARLES H. CUTLER . . . . . 125 Milk St., Boston.	VI.	With American Bell Telephone Co.
NELSON W. DALTON . . . . . Sandy Hill, N. Y.	VI.	Treasurer and General Manager, Bath Electric Illuminating and Power Co. (Bath, N. Y.).
HENRY B. DATES . . . . . Potsdam, N. Y.	VI.	Instructor in Electrical Engineering, Clarkson School of Technology.
T. CLIVE DAVIES . . . . . Honolulu, H. I.	II.	In Business.
LEON K. DAVIS . . . . . Aurora, Ill.	X.	With Jobbins & Van Ruymbeke, Patentees of New Process Glycerine Distillation.
NATHAN B. DAY, A.B. . . . . 280 Newbury St., Boston.	II.	With Standard Rope and Twine Co.

1894. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
DICKEY, CHARLES W. . . . Honolulu, Hawaiian Islands.	IV.	Architect.
HARRY S. DUCKWORTH . . . 64 Silver St., Dover, N. H.	V.	Chemist, Cocheco Manufacturing Co.
HENRY B. DU PONT . . . . Wilmington, Del.	X.	With E. I. du Pont, De Nemours, & Co.
JOHN ELLIS . . . . . Lonsdale, R. I.	VI.	Manager, Lonsdale Co.'s Electric Light Plant.
ARTHUR J. FARNSWORTH . . 27 Thames St., New York, N. Y.	VI.	In Business.
JOHN N. FERGUSON . . . . 3 Mt. Vernon St., Boston.	I.	With Metropolitan Water Board.
FREDERICK E. FOWLE, JR. . 1925 Fourth St., N. W. Washington, D. C.	VIII.	Assistant, Astrophysical Observatory, Smithsonian Institution.
HARRIET T. GALLUP . . . . 721 Lake Ave., Rochester, N. Y.	V.	Chemist, Eastman Kodak Co.
HARRY W. GARDNER . . . . Boston, Mass.	IV.	Instructor in Architecture, Mass. Institute of Technology.
J. HOWLAND GARDNER . . . Harlem River Station, New York, N. Y.	II.	Assistant Engineer, Lighterage Department, New York, New Haven, & Hartford R. R.
R. WALDO GILKEY . . . . 9 Irving St., Watertown, Mass.	II.	With Metropolitan Water Board.
LEWIS S. GREENLEAF . . . The Ludlow, Trinity Terrace, Boston.	VI.	With American Bell Telephone Co. (42 Farnsworth St., South Boston).
SARAH ABBIE HALL . . . . 5 Johnston Park, Roxbury, Mass.	VIII.	Teacher, The Cambridge School for Girls.
BURT S. HARRISON . . . . 16 So. Canal St., Chicago, Ill.	IV.	Travelling Engineer, Western Branch of B. F. Sturtevant Co.
HARRY P. HASTINGS . . . . South Framingham, Mass.	I.	In Business.
GEORGE B. HAVEN . . . . Boston, Mass.	II.	Instructor in Mechanical Engineering, Mass. Institute of Technology.
WILLIAM R. HILL . . . . 67 Moffat Block, Detroit, Mich.	IV.	With John Scott & Co., Architects.
CHARLES F. HOPEWELL . . . City Hall, Cambridge, Mass.	VI.	Inspector of Wires; Superintendent of Lamps, Fire Alarms, and Police Telegraph, City of Cambridge.
THEODORE HORTON . . . . 1 Mt. Vernon St., Boston.	XI.	Assistant Engineer, Metropolitan Sewerage Commission.
CLIFTON A. HOWES . . . . 579 Huron Ave., Cambridge, Mass.	VI.	With American Electric Heating Corporation. (Sears Bldg., Boston.)

1894. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
WILLIAM S. HULSE . . . Calverton, Baltimore, Md.	VI.	Electrical Engineer, Fort Wayne Electric Corporation.
ALBERT F. HUNT, JR. . . 143 E. Eighteenth St., New York, N. Y.	I.	On Personal Staff of Col. Waring, Street Cleaning Department.
EDWARD M. HUNT . . . 22 Beckett St., Portland, Me.	I.	Secretary, Commission of Public Works, City of Portland.
NED H. JANVRIN . . . Lexington, Mass.	I.	Draughtsman, Boston Bridge Works.
CHARLES H. JOHNSON . . 494 Center St., Jamaica Plain, Mass.	I.	Draughtsman, Boston Transit Commission. (2 Mt. Vernon St., Boston.)
HERBERT E. JOHNSON . . 123 W. Lorain St., Oberlin, Ohio.	VI.	With the American Telephone and Telegraph Co.
ALBERT L. KENDALL . . . 31 Milk St., Boston.	II.	Surveyor and Draughtsman, Associated Factory Mutual Fire Insurance Cos.
JOSEPH H. KIMBALL . . . West Newton, Mass.	XI.	In Office of City Engineer, City of Newton.
WILLIAM HERBERT KING . New York, N. Y.	IX.	Fellow, Columbia University.
ROBERT H. KIRK . . . 650 Summit Ave. St. Paul, Minn.	II.	With American Hoist and Derrick Co.
JOHN W. KITTREDGE . . . Victor, Colo.	II.	City Engineer, of Firm of Kittredge & Cooke, U. S. Deputy Mineral Surveyors, Civil and Mining Engineers.
CHARLES R. KNAPP . . . 1709 First St., Louisville, Ky.	IV.	With Snead & Co. Iron Works.
HENRY O. LACOUNT . . . 31 Milk St., Boston, Mass.	II.	Assistant Electrical Inspector, Associated Factory Mutual Fire Insurance Cos.
LUCIUS PAGE LANE, A.M. . 623 Tremont St., Boston.	IX.	
FREDERICK M. LEONARD . Arlington, Mass.	I.	Division Engineer, Arlington Sewerage System.
ROBERT LORING . . . 192 Devonshire St., Boston.	X.	Salesman and Assistant to New England Agent, R. Hoe & Co., of New York.
FRANK W. LOVEJOY . . . 184 Broadway, Cambridgeport, Mass.	X.	Chemist, Curtis Davis & Co., Soap Manufacturers.
GUY LOWELL, A.B. . . . Care Hottingner & Co., Paris, France.	IV.	Student, École des Beaux-Arts.
PATRICK M. LYNCH . . . 276 Dwight St., Holyoke, Mass.	I.	Civil Engineer.

1894. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
COLBERT A. MACCLURE . . . 716 Ferguson Bldg., Pittsburgh, Pa.	IV.	In Charge of Pittsburgh Office, Peabody & Stearns, Architects.
ANGUS R. MACKAY . . . . .	III.	With Horseshoe Mining and Milling Co. Deadwood, S. Dak.
MARION L. MAHONY . . . . .	IV.	Draughtsman with Frank L. Wright, Architect. 281 W. Adams St., Chicago, Ill.
FRED M. MANN, B.C.E., S.M. . . . .	IV.	Instructor in Architectural Design, University of Pennsylvania. Philadelphia, Pa.
VIRGINIUS A. MAYER . . . . .	VI.	With National Telephone Manufacturing Co. (620 Atlantic Ave.). Beach St., Wollaston, Mass.
HENRY K. MCGOODWIN, B.S. . . . .	IV.	Draughtsman for H. P. McDonald, Architect. 44 Bull Block, Louisville, Ky.
WILLIAM D. MCJENNETT . . . . .	X.	Chemist for D. S. Brown & Co. (Bank St. and North River, New York, N. Y.). 142 Columbia Heights, Brooklyn, N. Y.
FRANK P. MCKIBBEN . . . . .	I.	Instructor in Civil Engineering, Mass. Institute of Technology. Boston, Mass.
CHARLES A. MEADE . . . . .	I.	Superintendent, Final Disposition, Street Cleaning Department, New York City. 303 E. Eighteenth St., New York, N. Y.
LESLIE R. MOORE . . . . .	V.	Student in the University. Gaisbergstr. 36, Heidelberg, Germany.
LUTHER R. NASH . . . . .	VI.	With Stone & Webster, Electrical Experts and Engineers. 4 Post-Office Sq., Boston.
PARKER C. NEWBIGIN . . . . .	I.	Superintendent, Patten & Sherman R. R. Patten, Me.
HENRY L. NEWHOUSE . . . . .	IV.	Architect. 4630 Prairie Ave., Chicago, Ill.
FREDERIC M. NOA . . . . .	IX.	Teacher. Melrose Highlands, Mass.
JOHN C. NOWELL . . . . .	VI.	With Bell Telephone Co. of Philadelphia. 406 Market St., Philadelphia, Pa.
GEORGE OWEN, JR. . . . .	II.	
EDWIN M. PARKER . . . . .	IV.	In Business. West Acton, Mass.
WALTER W. PATCH . . . . .	I.	Assistant Engineer, Sudbury Department, Metropolitan Water Works. Marlboro, Mass.
JOSEPH W. PHELAN . . . . .	V.	Instructor in General Chemistry, Mass. Institute of Technology. Boston, Mass.
WALTER E. PIPER . . . . .	V.	Chemist, Boston Rubber Shoe Co. Malden, Mass.

1894. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
CLARENCE D. POLLOCK . . . Municipal Bldg., Brooklyn, N. Y.	I.	Assistant Civil Engineer, Department of City Works.
WILLIAM H. PRATT . . . 60 Eastern Ave., Lynn, Mass.	VI.	Fireman in charge of Laboratory, General Electric Co.
SAMUEL C. PRESCOTT . . . Boston, Mass.	V.	Instructor in Biology, Mass. Institute of Technology.
RAYMOND BEACH PRICE . . . Hampshire & Portland Sts., Cambridgeport, Mass.	X.	Chemical Engineer.
RICHARD W. PROCTOR . . . Cincinnati, Ohio.	V.	Chemist, William S. Merrell Chemical Co.
LOUIS W. PULSIFER, A.B. . . 6 Beacon St., Boston.	IV.	Architect.
NARCISO T. QUEVEDO, B.S. . . 6 <sup>a</sup> Avenida Sur 45, Guatemala, Central America.	II.	Mechanical Engineer and Importer of Machinery.
SAMUEL G. REED . . . 93 Oliver St., Boston.	II.	With Crosby Steam Gauge Co.
HOWARD S. REYNOLDS . . . 161 High St., Boston.	VI.	With Stone & Webster, Electrical Experts and Engineers, Experimental Department.
ROBERT D. REYNOLDS . . . 45 Orchard St., Jamaica Plain, Mass.	II.	Draughtsman, B. F. Sturtevant Co.
THOMAS G. RICHARDS . . . Cambridgeport, Mass.	II.	Manager of Textile Department, Boston Woven Hose and Rubber Co.
HENRY F. RIPLEY . . . 459 Blue Hill Ave., Roxbury, Mass.	II.	In Business.
FRANKLIN H. ROBBINS . . . Boston, Mass.	II.	Assistant in Mechanical Drawing, Mass. Institute of Technology.
ARTHUR S. ROGERS . . . 5535 Monroe Ave., Chicago, Ill.	VI.	With American Telephone and Telegraph Co.
S. ANTHONY SAVAGE . . . 117 Hawthorne St., Chelsea, Mass.	II.	Assistant Superintending Engineer, U. S. Light House Service.
ALBERT H. SAWYER . . . 146 Franklin St., Boston.	IX.	With Industrial Development Co.
WILLIAM H. SAYWARD, JR. . . 69 Monadnock St., Dorchester, Mass.	VII.	Student, Harvard Medical School (Boston).
FERDINAND ALFRED SCHIERTZ III. . . San José de Gracia, Sinoloa, Mexico.		Chemist for Cyanide Mill.
WALTER O. SCOTT, S.M. . . 790 Westminster St., Providence, R. I.	V.	With Nicholson File Co.



1894. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
GEORGE W. SHERMAN . . . 33 Hampshire St., Cambridgeport, Mass.	X.	Master Mechanic, Boston Woven Hose and Rubber Co.
ARTHUR A. SHURTLEFF, B.S. 9 W. Cedar St., Boston.	II.	Student.
FREDERIC P. SIMONDS . . . 55 Kilby St., Boston.	IV.	Draughtsman with J. Williams Beal, Architect.
WILLIAM A. SOLEY . . . Maple St., Chelsea, Mass.	III.	Clerk with J. Soley, Building Mover and Contractor.
FRANCIS M. SOUTHARD . . . 18 Broadway, New York, N. Y.	VI.	With Southard & Co., Timber and Lumber.
AUSTIN SPERRY . . . . .	II.	Student, Glasgow University. Glasgow, Scotland.
JOHN CONYNGHAM STEVENS 1914 Rittenhouse Sq., Philadelphia, Pa.	XI.	With Guarantee Trust & Safe Deposit Co. (318 Chestnut St.).
HENK, A. SWANTON . . . . .	II.	Draughtsman, Crescent Ship Yard. 350 Franklin St., Elizabeth, N. J.
GEORGE AYMAR TABER . . . New York, N. Y.	I.	District Superintendent, Street-Cleaning Department.
GEORGE TAYLOR . . . . .	II.	With Mexican Central Ry. Co. 70 Kilby St., Boston.
ALBERT B. TENNEY . . . . .	II.	Mechanical Engineer. (59 Congress St., Boston.) 35 Fremont Ave., Everett, Mass.
JOSEPH E. THROPP, JR. . . . Everett, Bedford Co., Pa.	III.	Superintendent, Everett Furnace and Mines.
ARTHUR W. TIDD . . . . .	I.	In Dam and Aqueduct Department, Met- ropolitan Water Works. 43 Walnut St., Clinton, Mass.
TOROS H. TOROSSIAN, B.A. . . Rustchuk, Bulgaria.	I.	Civil Engineer.
THEODORE VARNEY . . . . .	VI.	With Commercial Electric Co. U. S. Arsenal, Indianapolis, Ind.
HENRY E. WARREN . . . . .	VI.	Electrical Engineer. Newton Centre, Mass.
RIGBY WASON . . . . .	VI.	Superintending Foreman of Electric Light- ing, Malta Government Electricity Works. 8 Sussex Gardens, Hyde Park, London, W., England.
WILLIAM R. WESTCOTT, A.B. 42 Farnsworth St., South Boston.	VI.	With American Bell Telephone Co.
ROBERT C. WHEELER . . . . .	I.	Assistant Engineer, Mass. Highway Com- mission. 4 Mt. Vernon St., Boston.
KENNETH F. WOOD . . . . .	II.	With W. F. & F. C. Sayles (Saylesville, R. I.). Pawtucket, R. I.
C. NELSON WRIGHTINGTON Ludlow, Mass.	II.	Mechanical Engineer, Ludlow Manufactur- ing Co.

## 1895.

NAME AND ADDRESS.	COURSE.	OCCUPATION.
LOUIS ANDREW ABBOT . . . 108 Pembroke St., Boston.	II.	With Proprietors Locks and Canals (Lowell, Mass.).
BENJAMIN ADAMS . . . . 134 So. Fourth St., Philadelphia, Pa.	VI.	Inspector, American Telephone and Tele- graph Co.
CHARLES M. ADAMS . . . . 59 Waverly St., Roxbury, Mass.	VI.	With West End Street Ry. Co.
EDWIN CLEMENT ALDEN . . . 18 Cortlandt St., New York, N. Y.	VI.	With American Telephone and Tele- graph Co.
AZEL AMES, JR. . . . . Union Station, Boston.	I.	With Road Department, Western Division, Boston & Maine R. R.
ERNEST FRANKLIN BADGER . . . Lawrence, Mass.	V.	In Experiment Station, Mass. State Board of Health.
LATIMER W. BALLOU . . . . 16 Harris Ave., Woonsocket, R. I.	II.	Engineer, The Guerin Spinning Co.
LAWRENCE BARR, A.B. . . . Telephone Bldg., Pittsburgh, Pa.	VI.	Engineer, Central District and Printing Telegraph Co.
HAROLD K. BARROWS . . . . West Newton, Mass.	I.	With H. D. Woods, City Engineer, City of Newton.
EDMUND D. BARRY . . . . Bowdoin St., Dorchester, Mass.	XIII.	Draughtsman with U. S. Naval Constructor (at Wm. Cramp & Sons, Philadelphia, Pa.).
ETHEL BARTHOLOMEW, B.L. . . . Chariton, Iowa.	IV.	
FRANCIS W. BELKNAP . . . . 4 Mt. Vernon St., Boston.	I.	Resident Engineer, Mass. Highway Com- mission (Athol, Mass.).
CHARLES W. BERRY . . . . Düstere Eichenweg 20, Göttingen, Germany.	VI.	Student in the University.
S. LAWRENCE BIGELOW, A.B. . . . Ferdinand Rhodestr., Leipsic, Germany.	V.	Student in the University.
GEORGE L. BIXBY . . . . Boston, Mass.	X.	Graduate Student, Mass. Institute of Technology.
WALTER D. BLISS . . . . 160 Fifth Ave., New York, N. Y.	IV.	With McKim, Mead, & White, Architects.
PERLEY H. BLODGETT . . . . 130 Bloomfield Ave., Passaic, N. J.	V.	With Passaic Print Works.
JOHN BOEDEKER . . . . 8 Atwood Pl., Springfield, Mass.	VI.	Draughtsman, Duryea Motor-Carriage Co.
EDGAR A. BOESEKE . . . . Indianapolis, Ind.	II.	With Nordyke & Marmon Co., Manufac- turers of Flour Mill Machinery.
THOMAS B. BOOTH . . . . 186 Laurel St., Hartford, Conn.	VI.	With Motor-Carriage Department, Pope Manufacturing Co.
FRANK A. BOURNE, S.M. . . . 122 Ames Bldg., Boston.	IV.	With Shepley, Rutan, & Coolidge, Archi- tects.

1895. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
JESSE H. BOURNE . . . .	II.	Assistant in Mechanical Engineering, Mass. Institute of Technology.
WALLACE C. BRACKETT . .	XI.	Assistant Engineer, Mass. State Board of State House, Boston. Health.
ALLEN P. BROWN . . . .	IX.	Instructor, New Hampshire Conference Tilton, N. H. Seminary.
ARTHUR L. CANFIELD . . .	II.	With Boston Blower Co. Hyde Park, Mass.
H. W. CHAMBERLAIN, B.Sc., S.M.	IV.	Draughtsman with Cabot, Everett, & Mead, 22 Rutland Sq., Boston. Architects (62 Devonshire St.).
WALTER S. CHASE . . . .	IV.	With The Quincy Market Cold Storage Co. 78 Lexington St., East Boston, Mass.
WILLIAM B. CLAFLIN . . .	IV.	Draughtsman with McKim, Mead, & White, 160 Fifth Ave., New York, N. Y. Architects.
SIDNEY K. CLAPP . . . .	I.	With Metropolitan Water Board (3 Mt. 179 Boston St., South Boston. Vernon St.).
ARTHUR H. CLARK . . . .	VI.	Fruit Raising. P. O. Box M., Riverside, Cal.
CARL H. CLARK . . . .	XIII.	Assistant in Naval Architecture, Mass. Boston, Mass. Institute of Technology.
SCHUYLER S. CLARK . . .	VIII.	Instructor in Physics, Lehigh University. 505 W. Fourth St., South Bethlehem, Pa.
ARTHUR S. COBURN . . . .	III.	With Merrimack Manufacturing Co. 49 Oak St., Lowell, Mass.
LUTHER CONANT, JR. . . .	IX.	With "Journal of Commerce and Com- 17 Beaver St., New York, N. Y. mercial Bulletin."
CHARLES P. COOKE . . . .	VI.	Of Firm of Kittredge & Cooke, Civil and Mining Engineers, U. S. Deputy Mineral Victor, Colo. Surveyors.
J. WILLIAMSON COOKE . . .	VI.	With Edison Electric Illuminating Co., 3 Head Pl., Boston. Generating Department.
J. WINFIELD COOKE . . .	VI.	With Lawrence Gas Co. 256 Essex St., Lawrence, Mass.
FRED E. COX . . . . .	IV.	With E. A. Manny, Architect. 3603 Page Ave., St. Louis, Mo.
WALTER N. CRAFTS, A.B.	III.	214 Woodland Ave., Columbus, Ohio.
HENRY M. CRANE . . . .	II.	With American Bell Telephone Co. 125 Milk St., Boston.
GEORGE A. CUTTER . . . .	II.	With Coheco Manufacturing Co Dover, N. H.

1895.—*Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
WILLIAM E. DAVIS, JR. . . . 7214 Webster Ave., Chicago, Ill.	IV.	Draughtsman, D. H. Burnham & Co. Architects (The Rookery).
ARTHUR D. DEAN . . . . 18 Tremont St., Malden, Mass.	VI.	Teacher of Manual Training, Malden High School.
GEORGE DEFREN, S.M. . . . 449 Eighth St., South Boston.	V.	New England Representative, Jeffries Glass Works.
ALFRED L. DEJONGE . . . . Stapleton, N. Y.	II.	
EDWARD E. DENISON . . . . 390 Congress St., Portland, Me.	X.	Clerk.
JUDSON C. DICKERMAN . . . . 10 Minot St., Woburn, Mass.	X.	Chemical Engineer, Merrimac Chemical Co. (South Wilmington, Mass.).
BENJAMIN C. DONHAM . . . . 42 Market St., San Francisco, Cal.	I.	With San Francisco Bridge Co.
JOHN THOMPSON DORRANCE . . . . Weenderchaussee 28, Göttingen, Germany.	V.	Student in the University.
ALBERT W. DRAKE . . . . 134 So. Fourth St., Philadelphia, Pa.	VI.	With American Telephone and Telegraph Co.
FRED W. DRAPER . . . . 87 So. Fourth St., Aurora, Ill.	III.	With Chicago & Aurora Smelting and Refining Co.
WILLIAM J. DRISKO . . . . Boston, Mass.	VIII.	Instructor in Physics, Mass. Institute of Technology.
ALBERT DUNBAR . . . . 53 State St., Boston.	V.	Superintendent of Construction, The C. H. Egglee Construction Co.
ROLFE M. ELLIS . . . . McKeesport, Pa.	V.	Chemist, National Tube Works Co.
WALTER H. ELLIS . . . . 50 Prospect St., Woonsocket, R. I.	I.	With J. W. Ellis, Civil Engineer.
CHARLES F. EVELETH . . . . 105 Quincy St., Chicago, Ill.	VI.	With American Telephone and Telegraph Co.
ROBERT D. FARQUHAR, A.B. . . . . 3 Rue Soufflot, Paris, France.	IV.	Student, École des Beaux-Arts.
FRANCIS E. FAXON . . . . 27 Lincoln St., Auburn, N. Y.	II.	Draughtsman and Assistant in Exper- imental Department, D. M. Osborne & Co., Manufacturers of Harvesting Machinery.
MILTON L. FISH . . . . Pasadena, Cal.	VI.	Assistant Manager, Pasadena Electric Light and Power Co.
F. A. J. FITZ GERALD, B.A. . . . . Niagara Falls, N. Y.	VI.	With Carborundum Co.
ANDREW D. FULLER . . . . 28 Court Sq., Boston.	I.	With Street Department, City of Boston.

1895. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
JOHN H. GARDINER . . . 4 Liberty Sq., Boston.	II.	With Philadelphia & Boston Face Brick Co.
CHARLES M. GAY, JR., A.B. 3 Rue Soufflot, Paris, France.	IV.	Student, École des Beaux-Arts.
PERLEY F. GILBERT . . . Andover, Mass.	IV.	Draughtsman, Quincy Market Cold Storage Co. (Boston).
WATSON E. GOODYEAR . . .	VI.	
FRANCIS C. GREEN . . . 277 Pearl St., New York, N. Y.	XI.	With Rudolph Hering, Civil and Sanitary Engineer.
JOHN H. GREGORY . . . 3 Mt. Vernon St., Boston.	I.	With Metropolitan Water Board.
WILLIAM T. HALL . . . Göttingen, Germany.	V.	Student in the University.
FREDERICK A. HANNAH . . . Boston, Mass.	II.	Assistant in Mechanical Engineering, Mass. Institute of Technology.
FREDERICK W. HARRIS . . . West Boylston, Mass.	XI.	With Metropolitan Water Board, Reservoir Department.
HARRY M. HAVEN . . . Somerville, Mass.	II.	With Quincy Market Cold Storage Co. (Boston).
GEORGE W. HAYDEN . . . 493 Warren St., Roxbury, Mass.	VI.	With American Telephone and Telegraph Co. (134 So. Fourth St., Philadelphia).
HENRY A. HOLDREGE . . . 2730 Wabash Ave., Chicago, Ill.	VI.	With Chicago Telephone Co.
LEMUEL F. HOWARD . . . 3 Gilbert Pl., Boston.	VI.	Superintendent, U. S. Lighthouse Department, 1st and 2d Districts.
GEORGE R. HOWARTH . . . Shawmut Beach, R. I.	II.	Instructor in Physics and Chemistry, Providence Evening High School.
GEORGE E. HOWE . . . 20 Wesley Park, Somerville, Mass.	I.	With Metropolitan Water Board (3 Mt. Vernon St., Boston).
SAMUEL P. HUNT . . . 747 Union St., Manchester, N. H.	VI, X.	Inspector, American Telephone and Telegraph Co. (18 Cortlandt St., New York).
E. LAURENCE HURD . . . 8 Butler St., Dorchester, Mass.	II.	Draughtsman, West End Street Ry. Co.
EDWARD H. HUXLEY . . . 275 Devonshire St., Boston.	II.	With Boston Woven Hose and Rubber Co.
HERMANN KOTZSCHMAR, JR. Portland, Me.	II.	Assistant Engineer, U. S. Revenue Steamer "Woodbury."
HENRY O. LACOUNT, S.B. . .	VI.	(See Class of 1894.)
RALPH R. LAWRENCE . . . Boston, Mass.	VI.	Assistant in Physics, Mass. Institute of Technology.
MAURICE LE BOSQUET . . . 17 Marlborough St., Boston.	V.	Superintendent and Chemist, William H. Smith & Co., Manufacturers of Chemicals.
DORVILLE LIBBY, JR. . . . 135 Cumberland St., San Francisco, Cal.	VI.	With Pelton Water Wheel Co.

## 1895.—Continued.

NAME AND ADDRESS.	COURSE.	OCCUPATION.
ALFRED V. LINCOLN, JR. 32 Cordis St., Charlestown, Mass.	II.	
ANDREW J. G. LOGAN 16 Congress St., Lowell, Mass.	I.	With Maintenance of Way Department, Southern Division, Boston & Maine R. R.
ERNEST J. LORING 53 State St., Boston.	IV.	Draughtsman with Loring & Phipps, Architects.
THOMAS M. LOTHROP Sears Bldg., Boston.	II.	With American Electric Heating Corpora- tion.
DWIGHT N. MARBLE, A.B. 18 Cortlandt St., New York, N. Y.	VI.	With American Telephone and Telegraph Co.
WALTER C. MARMON Toledo, Ohio.	II.	With National Milling Co.
FRANK B. MASTERS Boston, Mass.	II.	Assistant in Mechanical Engineering, Mass. Institute of Technology.
FRANÇOIS E. MATTHES Hotel Bartol, Boston.	I.	With U. S. Geological Survey.
GERARD H. MATTHES Brookline, Mass.	I.	With Town Engineer.
JAMES T. R. McMANUS 20 Beacon St., Boston.	I.	Assistant Steel Inspector, Boston Transit Commission.
GEORGE F. C. MERRISS 3 Mt. Vernon St., Boston.	I.	In Engineering Department, Metropolitan Water Board.
CHARLES A. MESERVE Munich, Germany.	V.	Student in the University.
FRANKLIN T. MILLER 146 Franklin St., Boston.	XIII.	Secretary, The F. U. Dodge Co.
JOHN D. J. MOORE Lewiston, Me.	II.	Draughtsman, Lewiston Bleachery and Dye Works.
RICHARD MOREY Sedalia, Mo.	I.	City Engineer.
ARTHUR F. NESBIT, A.B. Durham, N. H.	VI.	Instructor in Physics and Electrical Engi- neering, New Hampshire College of Agriculture and the Mechanic Arts.
JOHN L. NEWELL 139 Milk St., Boston.	X.	With Page, Newell, & Co., Iron and Steel Merchants.
FRANKLIN A. PARK Winchendon, Mass.	II.	With Baxter D. Whitney, Manufacturer of Wood-working Machinery.
WINTHROP D. PARKER 6 Beacon St., Boston.	IV.	Draughtsman, with Stephen Codman, Architect.
CHARLES L. PARMELEE Louisville, Ky.	I., XI.	Engineering Assistant, Experimental Water Purification Station, Louisville Water Co.
WILLIAM F. PATTEN 125 Milk St., Boston.	VI.	With American Bell Telephone Co.
WALTER C. POWERS 116 Pearl St., Springfield, Mass.	X.	With Powers Paper Co. (Holyoke, Mass.).

1895. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
WALTER W. REED . . . . 591 Main St., Waltham, Mass.	VI.	With F. H. Kirwin, Plumbing and Heating Contractor.
FREDERICK L. RICHARDS . . 217 Summer St., Somerville, Mass.	X.	With James C. Davis & Son, Soap Manufacturers (Cambridgeport, Mass.).
WALTER J. RICKEY . . . . Danbury, Conn.	II.	Assistant Superintendent, The T. & B. Tool Co.
GEORGE A. ROCKWELL . . . The Warren, Roxbury, Mass.	X.	With Engineering Department, City of Boston.
LOUIS K. ROURKE . . . . Abington, Mass.	I.	With Maintenance of Way Department, Boston & Maine R. R.
HAROLD N. RUST . . . . 12 No. Franklin St., Wilkes-Barre, Pa.	VI.	Of Firm of Shepherd & Rust Electrical Contractors and Supply Dealers.
SAMUEL S. SADTLER . . . . 336 W. Franklin St., Germantown, Philadelphia, Pa.	V.	Chemist in U. S. Appraisers' Office.
CLIFFORD B. SANBORN . . . 49 Oxford St., Cambridge, Mass.	IX.	Student, Harvard University Law School.
FRANK C. SCHMITZ . . . . Pittsburgh, Pa.	I.	Assistant Engineer, Pennsylvania Lines west of Pittsburgh.
EDWARD P. SCHOENTGEN . . Council Bluffs, Iowa.	IV.	Student of Architecture (107 Boulevard St. Michel, Paris, France).
ROBERT K. SHEPPARD . . . 94 Grove St., Worcester, Mass.	X.	With Washburn & Moen Manufacturing Co.
RICHARD G. B. SHERIDAN . . Cleveland, Ohio.	XIII.	With The Brown Hoisting and Conveying Machine Co.
JOHN C. SHERMAN . . . . New London, Conn.	VI.	With Munsey's Magazine.
ALFRED L. SIMMONS . . . . Nash, Mass.	I.	In Office of Chief Engineer, New England Railroad (Boston).
ALFRED P. SLOAN, JR., . . . 240 Garfield Pl., Brooklyn, N. Y.	VI.	
WALTER F. STEVENS . . . . Newton Highlands, Mass.	II.	
WILLIAM E. SWIFT . . . . 3 Mt. Vernon St., Boston.	I.	In Engineering Department, Metropolitan Water Board.
GERARD SWOPE . . . . . 242 So. Jefferson St., Chicago, Ill.	VI.	Electrical Engineer.
CHARLES C. TAFT . . . . . 2300 Hamilton St., Philadelphia, Pa.	X.	With The E. H. Godshalk Co.
JAMES W. THOMAS . . . . . Wyoming, Pa.	II.	With Wyoming Shovel Works.
STURGIS H. THORNDIKE, A.B. City Hall, Boston.	I.	With City Engineer, City of Boston.

1895. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
CHARLES F. TILLINGHAST . 260 Angell St., Providence, R. I.	II.	With Granger Foundry and Machine Co.
EDWARD A. TUCKER . . . .	I.	
34 Broad St., New York, N.Y.		
HUGH M. TUCKER . . . .	II.	With Ernest Flagg, Construction Depart- ment.
214 E. Pike's Peak Ave., Colorado Springs, Colo.		
LOREN G. WAITE . . . .	VI.	With General Electric Co. (Lynn, Mass.).
105 Beltran St., Malden, Mass.		
JOSEPH E. WALWORTH . . .	V.	Student, University of Leipsic (Germany). Lawrence, Mass.
WILLARD H. WATKINS . . .	V.	
87 Poplar St., Roslindale, Mass.		
DAVID B. WESTON . . . .	V.	Chemist, Crystal Springs Manufacturing Co. Watertown, Mass.
RALPH N. WHEELER . . . .	I.	Leveller, Department of City Works. Municipal Bldg., Brooklyn, N.Y.
THOMAS H. WIGGIN . . . .	I.	With Metropolitan Water Board (Boston). 154 Mountain Ave., Malden, Mass.
CHARLES G. WILLIAMS . . .	I.	Assistant Engineer, Mass. Highway Com- mission (15 Court Sq., Boston).
55 E. Main St., Norwalk, Ohio.		
ROGER J. WILLIAMS . . . .	IX.	With Draper Brothers' Co. Canton, Mass.
WALTER S. WILLIAMS . . .	X.	Assistant Superintendent, H. N. Slater, Cambric Works (East Webster). P. O. Box 928, Webster, Mass.
WILLIAM H. WINKLEY . . .	XIII.	Special Agent, Hartford Fire Insurance Co. 58 Kilby St., Boston, Mass.
JOHN J. C. WOLFE . . . .	II.	Superintendent of Construction for W. H. Chamber of Commerce Bldg., Chicago, Ill.
LUTHER K. YODER . . . .	II.	With Construction Department, Maryland Steel Co. Sparrows Point, Md.
HENRY YOERG . . . . .	II.	Draughtsman, American Hoist and Derrick Co. 215 W. Isabel St., St. Paul, Minn.
ALFRED E. ZAPF . . . . .	IV.	Draughtsman with Willard T. Sears, Architect. 70 Kilby St., Boston.

## 1896.

BUTLER AMES . . . . .	II.	With U. S. Bunting Co., Agent of Wamesit Water Power Co. Lowell, Mass.
WILLIAM P. ANDERSON, JR.	III.	Assistant Engineer, Gold Creek, Nevada, Mining Co. Stofiel, Elko Co., Nev.



1896. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
WILLIAM M. ANDREW . . . 213 Liberty St., Schenectady, N. Y.	VI.	With General Electric Co.
GEORGE F. ASHTON . . . 336 Essex St., Salem, Mass.	II.	Draughtsman.
ERNEST C. ATKINS . . . 89 State St., Boston.	II.	Draughtsman, Meteor Despatch Co.
THOMAS W. BAILEY . . . 20 Beacon St., Boston.	I.	With Boston Transit Commission.
REUBEN E. BAKENHUS . . . Boston, Mass.	I.	Assistant in Civil Engineering, Mass. Institute of Technology.
EDWARD A. BALDWIN . . . Schenectady, N. Y.	VI.	With General Electric Co.
CHARLES E. BATCHELDER . . . 930 Fourth St., So. Boston, Mass.	VI.	
DANIEL M. BATES, JR. . . . Lawrence, Mass.	X.	With Pacific Mills Corporation.
DAVID W. BEAMAN . . . . Boston, Mass.	VI.	With West End Street Ry. Co.
FRANCIS P. BLAKE . . . . Jasper, Ala.	III.	Assistant Engineer, Elliott & Carrington, Contracting Engineers (Birmingham, Ala.).
GEORGE S. BOWES . . . . 673 E. Main St., Rochester, N. Y.	II.	With John Marsden, Contractor (Utica, N. Y.).
AUGUSTUS J. BOWIE, A. B. II., VI. 201 Clarendon St., Boston.		
EDWIN R. BRACKETT . . . . 100 Sargent St., Newton, Mass.	V.	
EDWARD M. BRAGG . . . . Boston, Mass.	XIII.	Assistant in Mechanical Engineering, Mass. Institute of Technology.
LEWIS B. BREED . . . . 9 Portland St., Lynn, Mass.	VI.	
JOHN F. BROOKS . . . . 47 Main St., No. Hanover, Mass.	II.	In Business
HARRY W. BROWN . . . . Lynn, Mass.	VI.	With General Electric Co., Meter Depart- ment.
HARRY P. BROWNE . . . . 511 Chenevert St., Houston, Tex.	VI.	
RUSSELL S. BUCHER . . . . 220 Devonshire St., Boston.	IV.	Draughtsman, with Francis R. Allen, Archi- tect.
GEORGE K. BURGESS . . . . Boston, Mass.	VIII.	Assistant in Physics, Mass. Institute of Technology.
JOHN G. CALLAN . . . . 3 Head Pl., Boston.	VI.	With Edison Electric Illuminating Co.

1896.— *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
LEWIS T. CANNON . . . Logan City, Utah.	IV.	Professor of Mathematics and Drawing, Utah Agricultural College.
HELEN CHAMBERLIN . . . Wrentham, Mass.	IV.	Teacher of Mathematics (66 Marlborough St., Boston).
WINTHROP H. CHENERY . . . Belmont, Mass.	IV.	Student, Harvard University.
JOSEPH W. CLARY . . . Newport News, Va.	XIII.	Assistant Draughtsman with Superintend- ing Constructor, U. S. N.
ALBERT E. CLUETT, A.B. . . . 42 Farnsworth St., South Boston.	VI.	With American Bell Telephone Co.
JOHN L. COLEY . . . . . 123 Brownell St., Providence, R. I.	II.	With Browne & Sharpe Manufacturing Co.
WILLARD H. COLMAN . . . . . 812 So. Sixth St., La Crosse, Wis.	II.	
FRANCIS M. CONANT . . . . . Watertown, Mass.	X.	With Matthieson Alkali Works (Saltville, Va.).
WILLIAM D. COOLIDGE . . . . . Boston, Mass.	VI.	Assistant in Physics, Mass. Institute of Technology.
WINTHROP COOLIDGE . . . . . 4752 Kimbark Ave., Chicago, Ill.	III.	Chemist, Chicago Copper Refining Co.
EDWIN C. CRAMER . . . . . 285 Lyon St., Milwaukee, Wis.	IV.	Draughtsman with W. D. Kimball, Archi- tect.
HENRY M. CRANE . . . . .	VI.	(See Class of 1895.)
STEPHEN D. CRANE . . . . . Boston, Mass.	VI.	
CARL I. CROCKER . . . . . 19 Upton St., Boston.	I.	Assistant, with Boston Transit Commission (20 Beacon St.).
RALPH W. CROSBY . . . . . Osterville, Mass.	XIII.	With D. & C. H. Crosby, Boat Builders.
HENRY CUMMINGS, JR. . . . . Boston, Mass.	IV.	Graduate Student, Mass. Institute of Technology.
NATHAN H. DANIELS, JR. . . . . Boston, Mass.	VI.	Graduate Student, Mass. Institute of Technology.
FRANKLIN H. DAVIS . . . . . P. O. Box 1606, Philadelphia, Pa.	III.	Assistant to the Inspector of Ordnance, U. S. A.
ROBERT A. DAVIS . . . . . 34 Dartmouth St., Boston.	VI.	Draughtsman, Huey Brothers (4 Oliver St.).
HAROLD W. DE LONG . . . . . Bristol, R. I.	XIII.	With Herreshoff Manufacturing Co.
LEONARD D. P. DICKINSON . . . . . 105 Quincy St., Chicago, Ill.	VI.	With American Telephone and Telegraph Co.

1896. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
WILLIAM T. DORRANCE, A.B. 98 Waterman St., Providence, R. I.	I.	
JAMES M. DRISCOLL . . . .	I.	Rodman, Metropolitan Water Works, Northborough, Mass. Dam and Aqueduct Department.
JOSEPH DRISCOLL . . . .	I.	Inspector, Boston Transit Commission. 2 Mt. Vernon St., Boston.
ALPHONSUS L. DRUM . . . .	VI.	With Boston Electric Light Co., Testing 609 Mass. Ave., Boston. Department.
FREDERICK E. FIELD . . . .	XI.	Assistant with City Engineer, Water De- City Hall, Boston. partment.
ELIZABETH F. FISHER . . .	XII.	Instructor in Geology, Wellesley College. 142 Trenton St., East Boston.
HARRY G. FISK . . . . .	IX.	With Davis Electrical Co. Taylor St., Springfield, Mass.
FREDERICK E. FORSTER . . .	X.	With Acushnet Mills Corporation. New Bedford, Mass.
GEORGE FRESCH, JR. . . . .	IV.	Draughtsman, with Charles Brigham, 27 Mt. Vernon St., Boston. Architect.
MYRON L. FULLER . . . . .	XII.	With Enterprise Publishing Co. 157 Spring St., Brockton, Mass.
ROBERT L. FULLER . . . . .	IV.	Architect. 452 Main St., Worcester, Mass.
STEPHEN DEM. GAGE . . . . .	V.	Biologist, Mass. State Board of Health, Lawrence, Mass. Lawrence Experiment Station.
HENRY GARDNER . . . . .	II.	Draughtsman, Boston & Maine R. R. Co. 24 Chestnut St., Salem, Mass. (Boston Shops).
ABRAM GARFIELD, A.B. . . .	IV.	Mentor, Lake Co., Ohio.
LEONARD H. GOODHUE . . . .	V.	Assistant in Analytical Chemistry, Mass. Boston, Mass. Institute of Technology.
EDWARD B. GORDON, JR. . . .	II.	174 Lewis St., Lynn, Mass.
AMADEUS W. GRABAU . . . .	XII.	Assistant in Geology, Mass. Institute of Boston, Mass. Technology; Lecturer in Museum of Boston Society of Natural History.
ANDREW H. GREEN, A.B. . . .	I.	Vice-President, Green's Dredging Co. 403 La Salle Ave., Chicago, Ill.
NATHAN C. GROVER, B.C.E. . .	I.	Assistant Professor of Civil Engineering, Orono, Me. Maine State College.
HENRY G. GRUSH . . . . .	VI.	With New England Telephone and Tele- 42 Farnsworth St., South Boston. graph Company, Construction Depart- ment.
FRANK E. GUPTILL . . . . .	VI.	With New England Telephone and Tele- Boston, Mass. graph Co.

1896. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
WALTER A. HALL . . . . 36 Wilbraham Road, Springfield, Mass.	VI.	Draughtsman, Duryea Motor Wagon Co.
JOHN S. HALLARAN . . . . 1203 Madison St., Toledo, Ohio.	I.	
CHARLES W. HAPGOOD . . . . 17 Abattoir St., Brighton, Mass.	V.	With Learnard, Bird, Oil Works.
ROBERT S. HARDY . . . . 16 No. High St., Bangor, Me.	VI.	With Public Works Co.
GEORGE E. HARKNESS . . . . 2 Mt. Vernon St., Boston.	I.	With Boston Transit Commission.
JOSEPH HARRINGTON . . . . P. O. Box 301, Xenia, Ohio.	II.	
HIRAM B. HARTWELL . . . . 57 Palfrey St., Watertown, Mass.	II.	Draughtsman, Boston Woven Hose and Rubber Co. (Cambridgeport).
JAMES H. HASTE . . . . 21 Spring St., Hartford, Conn.	V.	Chemist, Pope Manufacturing Co.
HARVEY F. HAWLEY . . . . Baldwinsville, N. Y.	I.	
HARRISON W. HAYWARD . . . . Boston, Mass.	X.	Assistant in Industrial Chemistry, Mass. Institute of Technology.
HENRY R. HEDGE . . . . Potsdam, N. Y.	IX.	Instructor, Thomas S. Clarkson Memorial School of Technology.
WILLIAM R. HEDGE . . . . 32 Court St., Plymouth, Mass.	IX.	In Plymouth National Bank.
FREDERICK M. HEERMANN . . . . 31 Milk St., Boston.	II.	Insurance Surveyor, Associated Factory Mutual Fire Insurance Companies.
JAMES B. HENDERSON . . . . 95 Milk St., Boston.	II.	With George S. Rice and George E. Evans, Civil and Hydraulic Engineers.
RALPH C. HENRY . . . . Boston, Mass.	IV.	Graduate Student, Mass. Institute of Technology.
JOSEPH HEWETT . . . . 32 Allen St., Brockton, Mass.	VIII.	With City Engineer.
WALTER M. HOLLIS . . . . 73 Newhall St., Lynn, Mass.	VI.	With General Electric Co.
JAMES C. HOPKINS . . . . 3 Hamilton Pl., Boston.	IV.	Draughtsman, with Winslow & Wetherell, Architects.
FRANK A. HOWARD . . . . 26 Cortlandt St., New York, N. Y.	I.	With Engineering Department, Erie R. R.
JOSEPH M. HOWE . . . . Austin, Texas.	I.	Law Student, University of Texas.
EUGENE C. HULTMAN . . . . 105 Washington St., Quincy, Mass.	I.	With United States Geological Survey.

1896. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
BENJAMIN HURD . . . . . Boston, Mass.	VI.	Graduate Student, Mass. Institute of Technology.
CHARLES G. HYDE . . . . . 70 Montgomery St., Boston.	XI.	With Mass. State Board of Health Engineering Department (State House).
CHARLES H. INGALLS . . . . . 3 Head Pl., Boston.	II.	With Edison Electric Illuminating Co., (Meter Department).
WALTER H. JAMES . . . . . Waltham, Mass.	VI.	Draughtsman, Waltham Bleachery and Dye Works.
MINOR S. JAMESON . . . . . Boston, Mass.	I.	Assistant in Civil Engineering, Mass. Institute of Technology.
HOWARD K. JONES . . . . . 89 Vandergrift Bldg., Pittsburgh, Pa.	IV.	Draughtsman with Aiden & Harlow, Architects.
THEODORE I. JONES . . . . . 18 Cortlandt St., New York, N.Y.	VI.	With American Telephone and Telegraph Co.
WILLIAM H. KEITH . . . . . St. Augustine, Fla.	VI.	With The Florida East Coast Hotel System, Lighting Department.
JOSEPH H. KNIGHT . . . . . 81 Oxford St., Cambridge, Mass.	IX.	Student, Harvard Law School.
LEEBERT L. LAMBORN, B.S. . . . . 601 Quincy St., Cleveland, Ohio.	V.	
CHARLES E. LAWRENCE, M.A. VI. . . . . 16 Smith St., Brooklyn, N. Y.	VI.	With New York and New Jersey Telephone Co., Engineering Department.
EUGENE H. LAWS . . . . . Boston, Mass.	V.	Assistant Chemist, Mass. State Board of Health.
MARSHALL O. LEIGHTON . . . . . 239 Claremont Ave., Montclair, N. J.	VII.	Agent, Montclair Board of Health.
WALTER S. LELAND . . . . . 3001 Jackson St., San Francisco, Cal.	XIII.	With U. S. Naval Constructor, Union Iron Works.
MARION L. LEWIS . . . . . 22 Congress St., Boston.	IV.	With T. M. Clark, Architect.
PAUL W. LITCHFIELD . . . . . 94 Howard Ave., Roxbury, Mass.	X.	With Metropolitan Park Commission.
CHARLES E. LOCKE . . . . . Rock Springs, Wyo.	III.	Engineer and Surveyor, Sweetwater Coal Mining Co.
JOHN E. LONNGREN . . . . . 300 E. Ninth St., Portsmouth, Ohio.	II.	With Norfolk & Western R. R.
ALF C. LOOTZ . . . . . 116 St. Botolph St., Boston.	I.	With Boston Transit Commission (20 Beacon St.).
GEORGE W. LYMAN . . . . . 18 Cortlandt St., New York, N.Y.	VI.	With New York Telephone Co., Engineer's Department.
HERMANN C. LYTTHGOE . . . . . Winthrop, Mass.	V.	Assistant Chemist, Revere Rubber Co. (Chelsea, Mass.).

1896. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
JOHN H. MANAHAN . . . Monadnock Bldg., Chicago, Ill.	VI.	With Sargent & Lundy, Mechanical and Electrical Engineers.
EDWARD S. MANSFIELD . . . 3 Head Pl., Boston.	VI.	With The Edison Electric Illuminating Co.
WILLIAM H. McALPINE . . . State House, Boston.	XI.	With Mass. State Board of Health.
FRANK G. McCANN . . . East Chatham, N. Y.	II.	
JAMES G. MELLUISH . . . 207 No. Main St., Bloomington, Ill.	IX.	Designer of Electrical Specialties.
IRVING S. MERRELL . . . 340 W. Fayette St., Syracuse, N. Y.	II.	Draughtsman, Merrell-Soule Co.
GEORGE E. MERRYWEATHER Providence, R. I.	II.	With Browne & Sharpe Manufacturing Co.
CHARLES P. MOAT . . . . . 70 Middle St., Portsmouth, N. H.	V.	
CHARLES MORRIS, JR. . . . . Fort Wadsworth, Staten Island, N. Y.	VI.	
CHARLES K. B. NEVIN . . . 220 Devonshire St., Boston.	IV.	With Francis R. Allen, Architect.
HERBERT D. NEWELL . . . 20 Beacon St., Boston.	I.	With Boston Transit Commission.
CHARLES S. NEWHALL . . . Stofiel, Elko Co., Nev.	III.	With Gold Creek Mining Co.
FRED B. OWEN . . . . . Jewett City, Conn.	VI.	
KARL A. PAULY . . . . . 21 Hall St., Somerville, Mass.	VI.	Inspector, New England Telephone and Telegraph Co. (Cambridge, Mass.).
WALTER O. PENNELL . . . Easton, Pa.	VI.	Instructor in Technical Mathematics, Lafay- ette College.
CLARENCE W. PERLEY . . . Boston, Mass.	VII.	Assistant in Biology, Mass. Institute of Technology.
JOEL H. PILLSBURY . . . . . 4 Mt. Vernon St., Boston.	I.	With Mass. Highway Commission.
EDWIN D. PINGREE . . . . . 31 Milk St., Boston.	II.	Surveyor and Draughtsman, Associated Factory Mutual Fire Insurance Cos.
HARRY A. PRESSEY, B.S. . . . 85 Water St., Boston.	I.	Assistant to Noyes & Hazen, Consulting Engineers.
JOHN L. PUTNAM . . . . . 105 Quincy St., Chicago, Ill.	VI.	With American Telephone and Telegraph Co.

1896. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
HARRY D. RAWSON . . . 630 University Pl., Evanston, Ill.	IV.	With J. L. Silsbee, Architect (Chicago, Ill.).
JAMES W. RAYNOLDS . . . Las Vegas, N. Mex.	III.	With First National Bank.
DANIEL A. RICHARDSON . . . 14 Craigie St., Cambridge, Mass.	II.	Graduate Student, Harvard University.
EDWIN H. ROBERTS . . . 601 McPhee Bldg., Denver, Colo.	II.	Mechanical Engineer.
JOHN A. ROCKWELL, JR. . . 42 Rockwell St., Norwich, Conn.	VII.	Student, Boston University Medical School (Boston).
WILLIAM L. ROOT . . . Boston, Mass.	X.	Assistant in Oil and Gas Analysis, Mass. Institute of Technology.
ALBERT F. RUCKGABER . . . 373 Carlton Ave., Brooklyn, N.Y.	VI.	
ANDREW L. B. RUSSELL . . . 28 State St., Boston.	IX.	Note Broker.
NORMAN F. RUTHERFORD . . . 47 John St., New York, N. Y.	VI.	With The New York Telephone Co.
LAWRENCE K. SAGER . . . 11 School St., Somerville, Mass.	VI.	With Charles H. Davis, Civil Engineer, (Boston).
NATHAN H. SANDERSON . . . Waltham, Mass.	I.	Draughtsman, Boston Bridge Works.
MORITZ SAX . . . . . Ames Bldg., Boston.	IV.	Draughtsman with Shepley, Rutan, & Coolidge, Architects.
FREDERICK F. SCHALLER . . . So. Natick, Mass.	VI.	With Standard Thermometer and Electric Co. (Peabody, Mass.).
DONALD C. SCOFIELD . . . 338 Erie St., Cleveland, Ohio.	IV.	Draughtsman with L. T. Scofield, Architect.
JOHN C. SCOVEL, JR. . . . . 883 Winthrop Ave., Station X., Chicago, Ill.	II.	
HENRY K. SEARS . . . . . Danvers, Mass.	IX.	With Eaton & Sears, Shoe Manufacturers.
MORTIMER A. SEARS . . . . . La Plata, Colo.	III.	With Pret, Trachsler, & Co.
GEORGE F. SHEPARD, JR. . . . . 53 State St., Boston.	IV.	Draughtsman with Peabody & Stearns, Architects.
FRANK N. SMALLEY . . . . . 264 Calhoun St., Cincinnati, Ohio.	V.	Instructor in Chemistry, University of Cincinnati.
SAMUEL T. SMETTERS, Ph.B. . . . . 2235 Michigan Ave., Chicago, Ill.	I.	Civil Engineer, with Hansell-Elcock Foundry Co. (Archer Ave. and Twenty-third Pl.).
FRED H. SMITH . . . . . 21 Spring St., Hartford, Conn.	X.	With Hartford Rubber Works Co., Ex- perimental Department.

1896. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
HERBERT E. SMITH . . . Boston, Mass.	IV.	Graduate Student, Mass. Institute of Technology.
HOWARD E. SMITH . . . Framingham, Mass.	XI.	With Boston Transit Commission (20 Beacon St., Boston).
ALBERT E. SMYSER . . . Boston, Mass.	II.	Graduate Student, Mass. Institute of Technology.
FREDERICK W. SMYSER . . . 6 Wellington Terrace, Brookline, Mass.	II.	Instructor in Machine Drawing, Massachusetts Nautical Training Ship "Enterprise."
JAMES S. SMYSER . . . Boston, Mass.	II.	Graduate Student, Mass. Institute of Technology.
WALTER M. STEARNS . . . 478 Main St., Waltham, Mass.	VI.	With Waltham Gas and Electric Light Co.
HAROLD C. STEVENS . . . Boston, Mass.	I.	Assistant in Civil Engineering, Mass. Institute of Technology.
JOSEPH W. STICKNEY . . . Somersworth, N. H.	VI.	
CHARLES H. H. STONE . . . 465 Centre St., Newton, Mass.	V.	
ESTHER STONE . . . 49 Westminster St., Providence, R. I.	IV.	Draughtsman with Stone, Carpenter, & Willson, Architects.
BRADLEY STOUGHTON, Ph.B. . . . 339 Prospect St., New Haven, Conn.	III.	Private Assistant with Prof. Richards, Mass. Institute of Technology.
MEYER J. STURM . . . 13 Lane Pl., Chicago, Ill.	IV.	Architect.
GEORGE W. SUMNER . . . 709 Georgia Ave., Omaha, Neb.	VI.	
HARRISON S. TAFT, B.P. . . . Newport News, Va.	II.	Assistant Draughtsman with U.S. Naval Constructor.
LEWIS H. TAPPAN . . . 9 Coddling St., Providence, R. I.	II.	With Builders' Iron Foundry, Architectural Department.
WILLIAM B. TAYLOR . . . Walnut St., Brookline, Mass.	II.	
FRANK A. THANISCH . . . Phillipsburgh, Mont.	III.	With Bi-Metallic Mining Co.
ALBERT W. THOMPSON . . . Manchester, N. H.	II.	Machinist, Amoskeag Manufacturing Co
LUCY D. THOMSON, A.B. . . . 88 Federal St., Springfield, Mass.	IV.	Draughtsman.



1896. — *Continued.*

NAME AND ADDRESS.	COURSE.	OCCUPATION.
SAMUEL F. THOMSON . . . Charleston, S. C.	I.	Assistant District Superintendent, Department of Street Cleaning, New York City (74 W. Eighty-second St.).
JOHN TILLEY . . . . . 18 Cortlandt St., New York, N.Y.	VI.	With New York Telephone Co.
HENRY H. TOZIER . . . . . Kodak Park, Rochester, N. Y.	V.	Chemist, Eastman Kodak Co, in charge of Celluloid Department.
CHARLES E. TROUT . . . . . 95 Appleton St., Boston.	I.	Draughtsman, New England Telephone and Telegraph Co.
CHARLES W. TUCKER . . . . . 104 Milk St., Boston.	V.	Chemist, Carbon Electric Generator Co.
ARTHUR P. UNDERHILL . . . . . 38 Westminster St., Springfield, Mass.	VI.	Draughtsman, Elektron Manufacturing Co.
GRACE A. VAN EVEREN . . . . . 84 Jefferson Ave., Brooklyn, N. Y.	V.	Instructor in Science, Erasmus Hall.
HERMANN V. VON HOLST, A.B. . . . . 1309 Venetian Bldg., Chicago, Ill.	IV.	Draughtsman with Shepley, Rutan, & Coolidge, Architects.
WILLIAM G. WALL . . . . . Buck Lodge, Md.	VI.	
ROBERT S. WASON . . . . . 61 Chatham St., Boston.	V.	With Wason & Co., Wholesale Grocers.
HENRY A. WATERMAN . . . . . 2 Prospect Court, Malden, Mass.	II.	
JACOB L. WAYNE . . . . . 18 Cortlandt St., New York, N.Y.	VI.	With New York Telephone Co., Engineering Department.
ALBERT J. WELLS . . . . . Boston, Mass.	II.	Assistant in Mechanical Drawing, Mass. Institute of Technology.
CHARLES A. WENTWORTH . . . . . 9 Howard St., Haverhill, Mass.	I.	With Boston Transit Commission (20 Beacon St., Boston).
LAMBERT N. WHITNEY . . . . . 18 Cortlandt St., New York, N.Y.	VI.	Inspector, American Telephone and Telegraph Co.
WILLIAM H. WHITTEN, JR. . . . . Boston, Mass.	VIII.	Graduate Student, Mass. Institute of Technology.
JOHN H. WILLIS, A.B. . . . . 68 Devonshire St., Boston.	IV.	Draughtsman, with J. C. Fowler, Architect.
WILLETT A. WOOD . . . . . 652 Fourth Ave., Detroit, Mich.	VI.	Electrical Engineer.
JULIAN E. WOODWELL . . . . . 7 Burlington Ave., Boston.	II.	Mechanical Engineer, with S. H. Woodbridge, Heating and Ventilation.
CONRAD H. YOUNG . . . . . 134 St. Botolph St., Boston.	II.	With Keck, Mosser & Co., Cut Sole and Leather (84 High St.).

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-third of all the students who have in the past been connected with the Institute.

## NUMBER OF GRADUATES BY CLASSES.

Class of 1868 . . . . .	14	Class of 1883 . . . . .	19
" " 1869 . . . . .	5	" " 1884 . . . . .	36
" " 1870 . . . . .	10	" " 1885 . . . . .	27
" " 1871 . . . . .	17	" " 1886 . . . . .	59
" " 1872 . . . . .	12	" " 1887 . . . . .	58
" " 1873 . . . . .	26	" " 1888 . . . . .	77
" " 1874 . . . . .	18	" " 1889 . . . . .	75
" " 1875 . . . . .	27	" " 1890 . . . . .	102
" " 1876 . . . . .	43	" " 1891 . . . . .	103
" " 1877 . . . . .	32	" " 1892 . . . . .	133
" " 1878 . . . . .	19	" " 1893 . . . . .	129
" " 1879 . . . . .	23	" " 1894 . . . . .	138
" " 1880 . . . . .	8	" " 1895 . . . . .	144
" " 1881 . . . . .	28	" " 1896 . . . . .	188
" " 1882 . . . . .	24		
Total . . . . .			1,594
Deduct names counted twice . . . . .			10
			<u>1,584</u>

## ALPHABETICAL LIST OF GRADUATES.

NAME.	COURSE.	CLASS.	NAME.	COURSE.	CLASS.
Abbot, Charles G.	VIII.	1894	Baker, Frederic W.	II.	1893
Abbot, Louis A.	II.	1895	Baker, Joseph B.	VI.	1890
Abbott, Frederic B.	VI.	1893	Baker, William H.	I.	1869
Abbott, Ira	I.	1881	Baldwin, Edward A.	VI.	1896
Aborn, George P.	II.	1886	Baldwin, Henry F.	II.	1884
Adams, Arthur H.	II.	1890	Baldwin, Hiram E.	I.	1890
Adams, Benjamin	VI.	1895	Baldwin, Thomas W.	I.	1876
Adams, Charles M.	VI.	1895	Ball, Robert S.	II.	1891
Adams, Raleigh B.	X.	1894	Ballard, Hetty O.	XII.	1893
Aiken, Charles W.	II.	1891	Ballou, Latimer W.	II.	1895
Albee, Orton W.	III.	1893	Barbour, Minard T.	II.	1893
Alden, Charles H., Jr.	IV.	1890	Bardwell, Fred L.	V.	1884
Alden, Edwin C.	VI.	1895	Bardwell, Herbert T.	I.	1883
Alden, Herbert W.	II.	1893	Barnes, William T.	I.	1893
Alden, John	V.	1877	Barr, Lawrence	VI.	1895
Allbright, William B.	V.	1878	Barri, Joel G.	I.	1891
Allen, C. Frank	I.	1872	Barrows, Harold K.	I.	1895
Allen, Charles F.	III.	1876	Barrows, Herbert	I.	1874
Allen, Charles R.	V.	1885	Barrows, Walter B.	VII.	1876
Allen, Charles V.	VI.	1893	Barrus, George H.	II.	1874
Allen, John H.	III.	1881	Barry, Edmund D.	XIII.	1895
Allen, Samuel E.	I.	1875	Barstow, George E.	II.	1894
Allen, Walter S.	V.	1879	Bartholomew, Ethel	IV.	1895
Ames, Azel	I.	1895	Bartlett, Dana P.	VI.	1886
Ames, Butler	II.	1896	Bartlett, Sidney R.	VII.	1887
Ames, Clara P.	V.	1882	Bartlett, Spaulding	V.	1890
Anderson, George H.	X.	1894	Bartlett, T. Harris	III.	1884
Anderson, William P., Jr.	III.	1896	Bartol, George	III.	1877
Andrew, William M.	VI.	1896	Barton, Charles A.	II.	1887
Andrews, Edmund L.	VI.	1894	Barton, George H.	III.	1880
Anthony, Arthur C.	III.	1886	Barton, Howard R.	VI.	1894
Anthony, John G.	III.	1893	Basford, George M.	II.	1889
Appleton, Charles B.	II.	1884	Bassett, William H.	V.	1891
Appleton, Ellery C.	III.	1868	Batchelder, Charles E.	VI.	1896
Armington, George A.	II.	1887	Batchelder, John L., Jr.	VII.	1890
Arnott, James L.	Sci. and Lit.	1875	Batcheller, Birney C.	II.	1886
Ashton, George F.	II.	1896	Bates, Daniel M., Jr.	X.	1896
Aspinwall, Thomas	I.	1876	Bates, Harry R.	V.	1894
Atkins, Ernest C.	II.	1896	Bates, Henry D.	IV.	1888
*Atkinson, James S. (Dec. 17, '83)	II.	1881	Batson, Walter V.	VI.	1894
Atwood, Frank W.	V.	1890	Beach, Charles B.	X.	1894
Atwood, William P.	V.	1876	Beach, Edward J.	V.	1889
Austin, Amory	V.	1873	Beach, Irving E.	V.	1894
Ayer, Arthur W.	II.	1890	Beal, Charles A.	VI.	1892
Babb, Cyrus C.	I.	1890	Beal, Foster, E. L.	I.	1871
Bachelor, Charles S.	V.	1877	Beal, J. Williams	IV.	1877
Badger, Ernest F.	V.	1895	Beaman, David W.	VI.	1896
Badger, Frank S.	I.	1893	Bean, Norwin S.	VI.	1894
Bailey, Thomas W.	I.	1896	Beasom, Charles B.	II.	1890
Bakenhus, Reuben E.	I.	1896	Beattie, Roy H.	I.	1893
Baker, Charles M.	IV.	1878	Beckler, Alice H.	VII.	1892
Baker, David	III.	1885	Beeching, William H.	II.	1877
Baker, Fred C.	II.	1894	Belknap, Francis W.	I.	1895

\* Deceased.

NAME.	COURSE.	CLASS.	NAME.	COURSE.	CLASS.
Bellows, Arthur B.	II.	1889	Brainerd, Wallace H.	VI.	1891
Bemis, Albert F.	I.	1893	Brainerd, William L.	IV.	1886
Benedict, Vallette L.	VI.	1894	Braley, Samuel T.	II.	1879
Benton, Edward R.	IV.	1885	Braman, Samuel N.	II.	1893
Berry, Charles W.	VI.	1895	Brand, Horace L.	II.	1891
Berry, Hereford	VI.	1894	Breed, Joshua B. F.	I.	1876
Bickford, Elizabeth E.	VII.	1890	Breed, Lewis B.	VI.	1896
Bigelow, Charles H.	VI.	1892	Breed, S. Alec	II.	1894
Bigelow, Henry F.	IV.	1888	Brewster, Benjamin E.	III.	1872
Bigelow, Samuel L.	V.	1895	Bridges, Luther W.	II.	1889
Binney, Amos	V.	1881	Briggs, Frank H.	IX.	1881
Bird, Adelaide	VII.	1891	Brooks, John F.	II.	1896
Bird, Herbert S.	V.	1888	Brotherton, William E.	V.	1873
Birks, John H.	IV.	1891	Brown, Alice I. (see Tyler).		
Biscoe, Maurice B.	IV.	1893	Brown, Allen P.	IX.	1895
Bissell, David S.	III.	1881	Brown, Bertha M.	VII.	1892
Bixby, George L.	X.	1895	Brown, Charles H.	I.	1880
Bixby, Willard G.	II.	1889	Brown, Edward D.	VI.	1890
Blackwell, Ethel B.	VII.	1891	Brown, Harry W.	VI.	1896
Blake, Edmund E.	II.	1893	Brown, John C.	VI.	1893
Blake, Francis P.	III.	1896	Brown, Walter V.	VI.	1894
Blake, William B.	I.	1887	Browne, Harry P.	VI.	1896
Blanchard, Frederick C.	II.	1891	Brownell, Ernest H.	I.	1890
Blanchard, Winslow	II.	1888	Bryant, Dixie L.	XII.	1891
Bliss, Walter D.	IV.	1895	Bryant, Ernest C.	I.	1893
Bliss, Zenas W.	II.	1889	Bryant, George H.	II.	1883
Blodgett, Aaron D.	II.	1876	Bryant, Henry F.	I.	1887
Blodgett, George W.	I.	1873	Bryant, William P.	X.	1891
Blodgett, Perley H.	V.	1895	Bryden, George W.	II.	1891
Blood, Grosvenor T.	II.	1894	Buchanan, Leonard B.	VI.	1893
Blood, John B.	VI.	1890	Bucher, Russell S.	IV.	1896
Blunt, William T.	I.	1874	Buchholz, Charles E.	I.	1893
Boardman, Henry A.	V.	1884	Buck, Arthur A.	VI.	1893
Boedecker, John	VI.	1895	Bulkley, J. Norman	VI.	1889
Boeske, Edgar A.	II.	1895	Burbank, Philip M.	VI.	1892
Bolan, Thomas V.	VI.	1891	Burgess, Frank G.	I.	1887
Booth, Thomas B.	VI.	1895	Burgess, George K.	VIII.	1896
Borden, Charles N.	II.	1889	Burgess, John K.	II.	1886
Boss, Austin D.	II.	1890	Burke, John R.	I.	1893
Boss, Charles R.	IX.	1894	Burlingham, Charles L.	III.	1886
Bothfeld, Charles C.	I.	1884	Burnet, Moses D.	III.	1875
Bourne, Frank A.	IV.	1895	Burnham, Charles M.	VI.	1892
Bourne, Jesse H.	II.	1895	Burnham, Edward C.	II.	1890
Bourne, Phillips P.	II.	1892	Burnham, Guy J.	X.	1892
Bovey, William H.	VI.	1894	Burnham, Harry A.	II.	1892
Bowen, Stephen	II.	1892	Burrage, Severance	VII.	1892
Bowes, George S.	II.	1896	Burrisson, Henry K.	I.	1875
Bowie, Augustus J., Jr.	II.	1896	Burton, Frank H.	II.	1891
Boyden, Amos J.	IV.	1875	Buttolph, Benjamin G.	II.	1888
Brace, Walter C.	III.	1887	Buttolph, Harry T.	I.	1876
Brackett, Edwin R.	V.	1896	Cabot, John W.	III.	1879
Brackett, Wallace C.	XI.	1895	Calkins, Gary N.	IX.	1890
Bradlee, Arthur T.	II.	1888	Callan, John G.	VI.	1896
Bradlee, Henry G.	VI.	1891	Callahan, Dennis E.	VI.	1893
Bradley, Frederick W.	VI.	1889	Came, Frank E.	I.	1881
Bradley, Harry C.	I.	1891	Cameron, Julian A.	II.	1887
Bragg, Charlotte A.	V.	1896	Campbell, George A.	I.	1891
Bragg, Edward F.	II.	1890	Campbell, Harry H.	III.	1879
Bragg, Edward M.	XIII.	1896	Canfield, Arthur L.	II.	1895
Brainerd, Dwight	IX.	1887	Cannon, Lewis T.	IV.	1896
Brainerd, Frederick H.	III.	1889	Capen, Barnard, Jr.	VI.	1891
Brainerd, Henry B.	IX.	1887	Capen, G. Walter	IV.	1877

280 MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

NAME.	COURSE.	CLASS.	NAME.	COURSE.	CLASS.
Card, Huber D.	XII.	1892	Cobb, Louis R.	I.	1886
Carleton, Elbridge S.	IV.	1888	Cobb, Sylvanus H.	VI.	1888
Carlisle, Morten	VI.	1890	Coburn, Arthur S.	III.	1895
Carlton, Chester V.	I.	1890	Cochran, Heywood	II.	1885
Carney, Edward B.	II.	1893	Codman, John S.	VI.	1893
Carney, Frank D.	III.	1887	Cody, Lewis P.	VI.	1892
Carney, James A.	V.	1890	Coffin, Fred S.	III.	1879
Carpenter, Anne White	V.	1891	Cogswell, Charles P., Jr.	I.	1892
Carr, W. Frank	I.	1884	Colby, John M., Jr.	II.	1892
Carson, Howard A.	I.	1869	Colby, Russell H.	V.	1888
Carson, Thomas B.	II.	1882	Cole, Fred A.	II.	1891
Carter, Henry H.	I.	1877	Cole, Fred B.	II.	1888
Carter, William W.	VI.	1894	Cole, Harrison I.	II.	1891
Carven, Christopher J.	I.	1884	Cole, Winthrop	II.	1887
Cater, Douglas A.	II.	1892	Coley, John L.	II.	1896
Center, David A.	VI.	1888	Collins, Benjamin G.	II.	1881
Chace, Mason S.	II.	1894	Collins, Bertrand R. T.	II.	1888
Chadbourne, William H., Jr.	III.	1886	Collins, Edward, Jr.	VI.	1888
Chamberlain, Herbert W.	IV.	1895	Collins, Reuben B.	I.	1891
Chamberlin, Helen	IV.	1896	Collins, William H.	V.	1890
Chamberlin, William E.	IV.	1877	Colman, Willard H.	II.	1896
Chapman, George D.	II.	1890	Conant, Francis M.	X.	1896
*Chapman, George (Jan. 21, '79)	II.	1877	Conant, Henry J.	II.	1887
Chapman, John W., Jr.	II.	1894	Conant, Luther, Jr.	IX.	1895
Chapman, Nathan C. W.	II.	1894	Conant, Roger W.	VI.	1891
Chase, Charles H.	VI.	1892	Conant, Whitney	III.	1868
Chase, Edwin E.	I.	1880	Conner, Arthur J.	V.	1888
Chase, Frank D.	III.	1881	*Connor, Addison (Jan. 4, '91)	I.	1871
Chase, Frank L.	I.	1890	Cook, Charles N.	X.	1893
Chase, Harold M.	V.	1896	Cook, Walter F.	IX.	1890
Chase, Harvey S.	II.	1883	Cooke, Charles P.	VI.	1895
Chase, Richard D.	XI.	1892	Cooke, J. Williamson	VI.	1895
Chase, Roscoe L.	V.	1884	Cooke, J. Winfield	VI.	1895
Chase, Walter S.	IV.	1895	Cooley, Helen	V.	1887
Chenery, Winthrop H.	IV.	1896	Coolidge, Prescott H.	I.	1894
Childs, Stephen	I.	1888	Coolidge, William D.	VI.	1896
*Childs, Edward L. (Mar. 31, '94)	II.	1891	Coolidge, Winthrop	III.	1896
Church, Albert K.	V.	1892	Copeland, Frederick K.	I.	1876
Church, Christopher A.	I.	1875	Copeland, Henry F.	I.	1894
Church, William L.	VI.	1886	Cox, Fred E.	IV.	1895
Cilley, Frank H.	I.	1889	Crabtree, Fred	V.	1889
Clafin, Alan A.	V.	1894	Crafts, Walter N.	III.	1895
Clafin, George E.	VI.	1888	Craighill, Nathaniel R.	VI.	1894
Clafin, William B.	IV.	1895	*Craigin, Henry A. (Nov. 27, '96)	II.	1889
Clapp, Harry L.	X.	1893	Cramer, Edwin C.	IV.	1896
Clapp, Sidney K.	I.	1895	*Crane, Francis H. (Apr. 15, '93)	VI.	1886
Clapp, Wilfred A.	I.	1893	Crane, Henry M.	VI.	1896
Clark, Arthur H.	VI.	1895	Crane, John G.	I.	1890
Clark, Carl H.	XIII.	1895	Crane, Joshua, Jr.	VI.	1892
Clark, Carrie Rice	V.	1882	Crane, Stephen D.	VI.	1896
*Clark, Edward K. (Sept. 10, '78)	II.	1870	Crary, Horace A.	I.	1894
Clark, Frederick W.	III.	1880	Crocker, Carl I.	I.	1896
Clark, James, Jr.	VI.	1890	Cromwell, Charles H.	II.	1889
Clark, Schuyler S.	VIII.	1895	Crosby, Ralph W.	XIII.	1896
Clarke, Edward D.	VI.	1894	Crosby, William O.	VII.	1876
Clarke, Fred H.	I.	1894	Crosby, William W.	II.	1893
Clary, Joseph W.	XIII.	1896	Cross, Charles R.	Sci. and Lit.	1870
Clement, Arthur A.	X.	1894	Cummings, Henry, Jr.	IV.	1896
Clement, Hugh B.	IV.	1891	Cunningham, Edward	X.	1891
Clifford, Harry E.	VI.	1886	Curtin, John A.	I.	1892
Clough, Albert L.	VI.	1891	Curtis, Ralph E.	II.	1887
Cluett, Albert E.	VI.	1896	Curtis, Russell H.	I.	1870

\* Deceased.

NAME.	COURSE.	CLASS.	NAME.	COURSE.	CLASS.
Cushing, William C.	I.	1887	Dolan, Peter F.	VI.	1893
Cutler, Charles H.	VI.	1894	Donham, Benjamin C.	I.	1895
Cutler, Harry H.	II.	1881	Donn, Edward W., Jr.	IV.	1891
*Cutler, Henry M. (May 16, '77)	I.	1871	Doolittle, Orrin S.	V.	1886
Cutter, George A.	II.	1895	Dorman, Theodore T.	X.	1893
Cutter, Louis F.	I.	1886	Dorr, Edgar S.	I.	1875
Cutter, Roland N.	I.	1889	Dorr, Frank H.	VI.	1891
Dadmun, George E.	II.	1892	Dorrance, John T.	V.	1895
Daggett, Herbert C.	I.	1891	Dorrance, William T.	I.	1896
Dalton, Nelson W.	VI.	1894	Douglass, Walter B.	I.	1892
Dame, Frank L.	VI.	1889	Dowse, William B.	IV.	1874
Dan, Takuma	III.	1878	Drake, Albert W.	VI.	1895
Dana, Gorham	I.	1892	Draper, Fred W.	III.	1895
Daniels, Nathan H., Jr.	VI.	1896	Dresser, Henry C.	II.	1892
Darlington, F. Graef	IX.	1881	Driscoll, James M.	I.	1896
Darrow, Courtland R.	I.	1893	Driscoll, Joseph	I.	1896
Dates, Henry B.	VI.	1894	Drisko, William J.	VIII.	1895
Davenport, William S.	V.	1889	Drum, Alphonsus L.	VI.	1896
Davies, T. Clive	II.	1894	du Bois, Barron P.	VI.	1892
Davis, Albert G.	VI.	1893	Duckworth, Harry S.	V.	1894
Davis, Arthur L.	II.	1889	Duff, James C.	V.	1886
Davis, Carleton E.	I.	1893	Duff, John	V.	1881
Davis, Frank E.	II.	1883	Dunbar, Albert	V.	1895
Davis, Franklin H.	III.	1896	Dunbar, Francis W.	VI.	1890
Davis, Leon K.	X.	1894	Dunbar, W. Otis	II.	1879
Davis, Robert A.	VI.	1896	Dunham, Lewis A.	I.	1891
Davis, William E., Jr.	IV.	1895	du Pont, Henry B.	X.	1894
Davis, Willis E.	Sci. and Lit.	1876	du Pont, Pierre S.	V.	1890
Dawes, Herbert N.	II.	1893	Durfee, Nathan	II.	1889
Day, Nathan B.	II.	1894	Dutton, Edgar F.	VI.	1888
Day, Sarah L.	V.	1887	Dwellely, Edwin F.	I.	1890
Dean, Arthur D.	VI.	1895	Dyar, Harrison G.	V.	1889
Dearborn, George K.	IX.	1893	Eastman, Henry F.	II.	1888
de Carvalho, Raul R.	IX.	1892	Eaton, Charles S.	IV.	1878
Defren, George	V.	1895	Edes, William C.	I.	1875
Dejonge, Alfred L.	II.	1895	Edmands, J. Rayner	II.	1869
de Lancey, Darragh	II.	1890	Edwards, Arthur V.	IV.	1889
Delano, Alexander J.	I.	1890	Eldridge, George F.	V.	1892
Delong, Harold W.	XIII.	1896	Ellis, John	VI.	1894
Demond, Charles D.	III.	1893	Ellis, Rolfe M.	V.	1895
Denison, Edward E.	X.	1895	Ellis, Walter H.	I.	1895
*Dennett, Clarence L. (June 6, '78)	II.	1876	*Ellsworth, Alfred B. (Jan 10, '93)	I.	1888
Dennett, W. Hartley	IV.	1892	Ely, Edward F.	IV.	1882
Densmore, Edward D.	VI.	1893	Ely, Sumner B.	II.	1892
Derr, Louis	VI.	1892	Emerson, Joseph S.	I.	1874
Devens, Richard	II.	1888	Emery, Elwood A.	IV.	1890
De Wolf, John O.	II.	1890	Emery, James A.	I.	1893
Dewson, Edward H., Jr.	II.	1885	Emmerton, Frederic A.	V.	1872
Dickerman, Judson C.	X.	1895	England, Paul W.	VI.	1891
Dickey, Charles W.	IV.	1894	Ensworth, Horace H.	VI.	1891
Dickinson, Leonard D. P.	VI.	1896	Eppendorff, John G.	IV.	1883
Dill, Howard A.	I.	1891	Eppes, Richard, Jr.	II.	1888
Dillon, Frederick N.	V.	1893	Esty, William	VI.	1893
Dixon, Laurence B.	VI.	1893	Eveleth, Charles F.	VI.	1895
Doane, Alfred O.	III.	1884	Fabens, George W.	I.	1879
Doane, George E.	I.	1874	*Fabens, Samuel A., Jr. (Mar. 14, '75)	I.	1873
Dodd, Margaret E.	VII.	1892	Farmer, George W.	II.	1886
Dodge, Charles R.	IX.	1889	Farnsworth, Arthur J.	VI.	1894
Dodge, Frank S.	I.	1875	Farquhar, Robert D.	IV.	1895
Dodge, Frederick H.	II.	1890	Farwell, Arthur	VI.	1893
Dodge, Samuel D.	I.	1893	*Faunce, Elmer (July, 6, '82)	III.	1871
Dodge, William B.	I.	1872	Faunce, George	III.	1882
Doe, Charles C.	VII.	1886	Faunce, Linus	II.	1877

\* Deceased.

282 MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

NAME.	COURSE.	CLASS.	NAME.	COURSE.	CLASS.
Favor, George W.		III. 1891	Fuller, Myron L.		XII. 1896
Faxon, Francis E.		II. 1895	Fuller, Robert L.		IV. 1896
Fay, Frederic H.		I. 1893	Fuller, William B.		I. 1883
Feland, Logan		IV. 1892	*Furber, Pierce P. (Apr. 7, '83)		IV. 1877
Felton, Samuel M.		I. 1873	Gage, Stephen D.		V. 1896
Fenn, William H.		I. 1890	Gale, Horace B.		II. 1883
Ferguson, John N.		I. 1894	Galloupe, Francis E.		II. 1876
Ferguson, Louis A.		VI. 1888	Gallup, Harriet T.		V. 1894
Field, Frederick E.		XI. 1896	Gamble, William B.		IX. 1893
*Firth, Frank R. (June 9, '72)		I. 1868	Gannett, Earl W.		VI. 1889
Fish, Milton L.		VI. 1895	Gardiner, Edward G.		VII. 1882
Fish, Walter C.		VI. 1887	Gardiner, John H.		II. 1895
Fisher, Charles H.		II. 1877	Gardner, Harry W.		IV. 1896
Fisher, Elizabeth F.		XII. 1896	Gardner, Henry		II. 1896
Fisher, Frederick L.		I. 1873	Gardner, J. Howland		II. 1894
Fisk, Harry G.		IX. 1896	Garfield, Abram		IV. 1896
Fiske, Henry A.		VI. 1892, X. 1891	Garfield, Alexander S.		II. 1886
Fiske, J. Parker B.		VI. 1889	Garrison, Charles		VI. 1891
Fitch, Alfred L.		II. 1884	Gay, Charles M.		IV. 1895
Fitz Gerald, Francis A. J.		VI. 1895	Gay, Joseph B.		IV. 1887
Fletcher, Charles R.		V. 1876	Gay, Martin		I. 1877
Flint, Bertram P.		II. 1888	Gaylord, Wallace K.		V. 1893
*Flint, Wm. C. (June 14, '81)		III. 1877	Gerrish, William H.		II. 1888
Flint, William P.		II. 1890	Gilbert, James P.		V. 1889
Flood, Samuel D.		II. 1890	Gilbert, Perley F.		IV. 1895
Foote, Edward H.		I. 1871	Gilkey, R. Waldo		II. 1894
Foque, Theodore A.		II. 1888	Gill, Augustus H.		V. 1884
Foran, George J.		II. 1883	Gill, Edward P.		IV. 1892
Forbes, Eli		Sci. and Lit. 1868	Gilman, Charles C.		III. 1868
Forbes, Fred B.		V. 1893	Gilmore, George L.		II. 1890
Forbes, Howard C.		VI. 1892, X. 1891	Gilmore, Howard		VI. 1893
Forbush, Gayle T.		X. 1892	Gleason, Walter H.		II. 1892
Forster, Frederick E.		X. 1896	Glidden, John W.		V. 1887
*Foss, Edward S. (Oct. 3, '90)		V. 1886	*Glover, Marie O. (see Holman).		II. 1890
Foss, Fred E.		I. 1886	Goddard, David S.		III. 1881
*Foss, Harry A. (Aug. 19, '85)		II. 1882	Goodale, Charles W.		III. 1875
Foster, Theodore R.		II. 1886	Goodell, George H.		II. 1892
Fowle, Arthur E.		X. 1893	Goodhue, Leonard H.		V. 1896
Fowle, Frederick E., Jr.		VIII. 1894	Gooding, Charles S.		II. 1879
Fox, Frederick		V. 1885	Goodrich, Robert R.		III. 1885
Fox, John M.		VI. 1887	Goodwin, Harry M.		VIII. 1890
Francis, Frederick L.		IV. 1892	Goodyear, Watson E.		VI. 1895
Freeman, John R.		I. 1876	Gordon, Edward B., Jr.		II. 1896
French, Alfred W.		I. 1889	Gorham, Marvine		II. 1893
French, Allen		IX. 1892	*Gould, Robert H. (Nov. 19, '78)		Metall. 1876
French, Charles A.		III. 1882	Grabau, Amadeus W.		XII. 1896
French, Edward R.		VI. 1892	Gray, Joseph P.		I. 1877
French, Edward V.		II. 1889	Gray, William P.		VI. 1892
French, George L. R.		I. 1884	Green, Andrew H.		I. 1896
French, Hollis		VI. 1889	Green, Francis C.		XI. 1895
French, Lester G.		II. 1891	Green, William W.		I. 1892
Fresch, George, Jr.		IV. 1896	Greene, Charles E.		I. 1868
Frisbie, Walter L.		II. 1893	*Greene, Irving G. (Feb. 24, '91)		I. 1888
Frost, Howard V.		V. 1882	Greenlaw, Frank M.		VI. 1890
Fry, Thomas W.		II. 1885	Greenleaf, Lewis S.		VI. 1894
Fukuzawa, Stejiro		I. 1888	Gregory, John H.		I. 1895
Füger, Frederic W.		II. 1891	Greer, Medorem W.		VI. 1891
Fuller, Andrew D.		I. 1895	Grimes, Charles B.		V. 1892
Fuller, Charles E.		II. 1892	Gross, Harold G.		VII. 1888
Fuller, Frank L.		I. 1871	Grover, Edmund		I. 1877
Fuller, George W.		V. 1890	Grover, Nathan C.		I. 1896
Fuller, J. Edward, Jr.		IV. 1888	Grush, Henry G.		VI. 1896

\* Deceased.

NAME.	COURSE.	CLASS.	NAME.	COURSE.	CLASS.
Guild, Frederick, Jr.	Sci. and Lit.	1873	*Head, James H. (Aug. 18, '75)	II.	1875
Guppy, Benjamin W.	I.	1889	Heath, George L.	V.	1888
Gurhill, Frank E.	VI.	1896	Hedge, Henry R.	IX.	1896
Gustin, George H.	III.	1883	Hedge, William R.	IX.	1896
Hadaway, William S., Jr.	VIII.	1887	Heermann, Frederick M.	II.	1896
Hadley, Frederick W.	VI.	1893	Heins, George L.	IV.	1882
Hagar, Edward McK.	II.	1893	Henck, John B., Jr.	VIII.	1876
Haines, Frank M.	III.	1884	Henderson, James B.	II.	1896
Hale, George E.	VIII.	1890	Henry, Ralph C.	IV.	1896
Hale, Richard A.	I.	1877	Herrick, Edward W.	II.	1888
Hall, Albert F.	II.	1868	Herrick, James A.	V.	1872
Hall, Edward C., Jr.	II.	1892	Hersam, Ernest A.	V.	1891
Hall, Francis P.	V.	1882	Hewett, Joseph	VIII.	1896
Hall, John R.	VI.	1890	Heywood, Albert S.	VI.	1892
Hall, Sarah A.	VIII.	1894	Heywood, George H.	III.	1884
Hall, Walter A.	VI.	1896	*Heywood, Lincoln C. (Dec. '94)	I.	1891
Hall, William T.	V.	1895	Hibbard, Henry D.	III.	1877
Hallaran, John S.	I.	1896	Hibbard, Thomas	II.	1875
Hamblet, George W.	II.	1888	Higgins, Alfred S.	IV.	1878
Hamilton, Edgar L.	III.	1891	Higgins, Edward E.	VI.	1886
Hamilton, George W.	I.	1880	Hildreth, William O.	II.	1887
Hammett, Edward A. W.	I.	1875	Hill, William R.	IV.	1894
Hammett, Philip M.	II.	1890	Hilliard, John D., Jr.	VI.	1892
Hammond, Charles F.	I.	1891	Hinckley, J. Fred	X.	1893
Hanchett, George T.	VI.	1893	Hinman, Charles W.	III.	1870
Handy, Edward A.	I.	1875	Hobart, Henry M.	VI.	1889
Hannah, Frederick A.	II.	1895	Hobart, James C.	II.	1887
Hapgood, Charles W.	V.	1896	Hobbs, Franklin W.	II.	1889
Hardman, John E.	III.	1877	Hodgdon, Frank W.	I.	1876
Hardy, Robert S.	VI.	1896	Hodge, James M.	III.	1872
Harkness, George E.	I.	1896	Holbrook, Elliot	I.	1874
Harriman, Frederic O.	I.	1883	Holder, James G.	V.	1884
Harrington, Joseph	II.	1896	Holder, James G.	V.	1884
Harrington, Walter K.	I.	1885	Holdrege, Henry A.	VI.	1895
Harris, Frederick W.	XI.	1895	Hollingsworth, Sumner	II.	1876
Harris, W. Dale	I.	1873	Hollis, Frederick S.	V.	1890
Harris, William L.	VII.	1888	Hollis, Walter M.	VI.	1896
Harrison, Burt S.	IV.	1894	Holman, George U. G.	VI.	1889
*Hartwell, Ernest G. (Sept. 22, '89)	IV.	1879	*Holman, Marie G. (May 5, '85)	V.	1881
Hartwell, Hiram B.	II.	1896	Holman, Silas W.	VIII.	1876
Harvey, Frederic H.	III.	1893	Holmes, Francis C.	IX.	1892
Harvey, George L.	II.	1888	Holmes, George A.	X.	1891
*Harwood, F. W., Jr. (Oct. 18, '95)	VI.	1894	Holton, Edward C.	V.	1888
Harwood, Harry A.	I.	1892	Homer, Eleazer B.	IV.	1885
Haskins, William	III.	1891	Hongma, Aechirau	I.	1874
Haste, James H.	V.	1896	Hooker, Richard	IV.	1889
Hastings, Charles F.	III.	1888	Hopewell, Charles F.	VI.	1894
Hastings, Harry P.	I.	1894	Hopkins, Frederick L.	V.	1889
Hatch, Arthur E.	I.	1891	Hopkins, James C.	IV.	1896
Hathaway, D. Lewis K.	II.	1886	Hopkins, Prescott A.	IV.	1892
Hathaway, Herbert E.	V.	1891	Hopkins, William J.	VI.	1886
Hathaway, Savory C., Jr.	VI.	1888	Hopton, Walter E.	II.	1891
Haven, George B.	II.	1894	Horn, Henry J., Jr.	I.	1888
Haven, Harry M.	II.	1895	Horton, S. Ellsworth	II.	1890
Hawley, Harvey F.	I.	1896	Horton, Theodore	XI.	1894
Hayden, Charles	IX.	1890	Hosea, Raphael M.	I.	1879
Hayden, George W.	VI.	1895	Houck, William G.	I.	1893
Hayden, Sophia G.	IV.	1890	Howard, Charles P.	I.	1874
Hayes, Frank	II.	1890	Howard, Frank A.	I.	1896
Hayes, Harry E.	VI.	1892	Howard, Lemuel F.	VI.	1895
Hayward, Harrison W.	X.	1896	Howarth, George R.	II.	1895
Hazard, Schuyler	I.	1890	Howe, George E.	I.	1895
			Howe, Henry M.	III.	1871

\* Deceased.



NAME.	COURSE.	CLASS.	NAME.	COURSE.	CLASS.
Howe, Horace J.	I.	1879	Kendall, Charles B.	V.	1887
Howe, Joseph M.	I.	1896	Kendall, Francis H.	I.	1890
Howes, Clarence L.	II.	1873	Kendall, William R.	VI.	1892
Howes, Clifton A.	VI.	1894	Kenison, Ervin	II.	1893
Howland, Albert H.	I.	1871	Kenney, C. Belle	V.	1886
Howland, Frederick H.	IX.	1893	Kennicott, Harry A.	I.	1890
Hoxie, Frederick J.	VI.	1892	Keough, William T.	II.	1888
Hoyt, William E.	I.	1868	Keyes, Frederic H.	II.	1893
Hulse, William S.	VI.	1894	Kilham, Alfred C.	II.	1876
Hultman, Eugene C.	I.	1896	Kilham, Walter H.	IV.	1889
Hunt, Albert F., Jr.	I.	1894	Kimball, Herbert S.	X.	1891
Hunt, Alfred E.	III.	1876	Kimball, Joseph H.	XI.	1894
Hunt, Edward M.	I.	1894	*Kimball, William A. (Dec. '87)	II.	1873
Hunt, Harry H.	VI.	1889	King, Warren D.	VI.	1893
Hunt, Samuel P.	VI., X.	1895	King, William H.	IX.	1894
*Huntington, W. F. (Aug. 7, '77)	I.	1875	Kinnicutt, Leonard P.	V.	1875
Hurd, Benjamin	VI.	1896	Kinsman, Arthur D.	VIII.	1889
Hurd, E. Lawrence	II.	1895	*Kirk, Joseph (July, '86)	II.	1877
Hussey, Oren S.	II.	1887	Kirk, Robert H.	II.	1894
Hutchings, James H.	II.	1883	Kittredge, George W.	I.	1877
Hutchins, Edward S.	II.	1889	Kittredge, John W.	II.	1894
Hutchinson, W. Spencer	III.	1892	Knapp, Charles R.	IV.	1894
Huxley, Edward H.	II.	1895	Knapp, Frederick B.	I.	1879
Hyde, Charles G.	XI.	1896	Knapp, George F.	V.	1884
Ingalls, Charles H.	VI.	1896	Knapp, J. Austin	II.	1876
Ingalls, Walter R.	III.	1886	Knight, Franklin	I.	1890
Ingraham, George H.	IV.	1892	Knight, Joseph H.	IX.	1896
Jackson, Daniel D.	V.	1893	Knowles, Morris, 2d	I.	1891
Jackson, Frank H.	III.	1874	Knowlton, Willis T.	I.	1893
Jacobs, Arthur L.	VI.	1892	Koch, Armand D.	IV.	1892
Jacques, William W.	VIII.	1876	Koehler, Walter J.	V.	1881
James, Frank M.	II.	1888	Kotzschmar, Hermann, Jr.	II.	1895
James, Lawrence S.	V.	1893	Kunhardt, Lewis H.	II.	1889
James, Samuel, Jr.	III.	1876	Lacount, Henry O.	VI.	1895
James, Walter H.	II.	1896	Lamb, William F.	VI.	1893
Jameson, Arthur H.	V.	1893	Lambert, Wallace C.	I.	1893
Jameson, Minor S.	I.	1896	Lamborn, Leebert L.	V.	1896
Janvrin, Ned H.	I.	1894	Lane, Fred H.	II.	1879
Jenkins, Charles D.	V.	1882	Lane, Lucius P.	IX.	1894
Jenney, Walter	III.	1877	Lane, William H.	VI.	1892
*Jewett, William P. (Jan. 4, '84)	I.	1873	Latey, Harry N.	VI.	1893
Johnson, Charles H.	I.	1894	Latham, Harry M.	II.	1893
Johnson, Herbert E.	VI.	1894	Lauder, George B.	VI.	1889
Johnson, James W.	I.	1882	Lawrence, Charles E.	VI.	1896
Johnson, Jesse F.	X.	1892	*Lawrence, J. A. McC. (Jan. 18, '93)	II.	1886
Johnson, Lewis E.	II.	1889	Lawrence, Ralph R.	VI.	1895
Johnson, William S.	I.	1889	Lawrence, William H.	IV.	1891
Johnston, William A.	II.	1892	Laws, Eugene H.	V.	1896
Jones, Arthur W.	VI.	1888	Laws, Frank A.	VI.	1889
Jones, Edward A.	II.	1887	Lawton, Charles F.	I.	1877
Jones, Howard K.	IV.	1896	Leach, Albert E.	II.	1886
Jones, Theodore I.	VI.	1896	Le Bosquet, Maurice	V.	1895
Jordan, Edwin O.	VII.	1888	Lee, Elisha, Jr.	I.	1892
Jordan, Harry W.	V.	1891	Lee, George S.	I.	1888
Jordan, William F.	I.	1886	Leeming, Woodruff	IV.	1891
Kales, William R.	II.	1892	Leighton, Marshall O.	VII.	1896
Kauffman, Milton H.	V.	1891	Leland, Walter S.	XIII.	1896
Kebler, Julian A.	I.	1878	Leland, William E.	II.	1891
Keene, Thomas M.	I.	1891	Lenfest, Bertram A.	II.	1890
Keene, William F.	I.	1891	Leonard, Frederick M.	I.	1894
Keith, Simeon C., Jr.	VII.	1893	Leonard, H. Ward	III.	1883
Keith, William H.	VI.	1896	Le Sueur, Ernest A.	VI.	1890
Kendall, Albert L.	II.	1894			

\* Deceased.

NAME.	COURSE.	CLASS.	NAME.	COURSE.	CLASS.
Lewis, Edwin J., Jr.	IV.	1881	Mansfield, Harvey M.	III.	1883
Lewis, Herbert	VI.	1893	Mansfield, R. Herbert, Jr.	VI.	1892
Lewis, Marion L.	IV.	1896	Marble, Dwight N.	VI.	1895
Lewis, Theodore J.	II.	1876	March, Clement	I.	1891
Lewis, Wilfred	II.	1875	Marcy, Willard A.	II.	1893
Lewis, William W.	II.	1889	Marmon, Walter C.	II.	1895
Libby, Dorville, Jr.	VI.	1895	Marquand, Philip	I.	1891
Lincoln, Alfred V., Jr.	II.	1895	Martin, Henry	V.	1885
Lincoln, G. Russell	III.	1871	Mason, Sampson D.	I.	1870
Lindsay, William B.	V.	1881	Masters, Frank B.	II.	1895
Linzee, John W., Jr.	I.	1889	Mathews, Albert P.	VII.	1892
Litchfield, Paul W.	X.	1896	Matthes, François E.	I.	1895
Livermore, William D.	V.	1887	Matthes, Gerard H.	I.	1895
Locke, Bradford H.	III.	1872	May, George H.	V.	1892
Locke, Charles E.	III.	1896	*May, William C. (Mar. 11, '78)	V.	1873
Locke, Frank L.	I.	1886	Mayer, Virginus A.	VI.	1894
Locke, William W.	XI.	1892	McAlpine, William H.	XI.	1896
Logan, Andrew J. G.	I.	1895	McCann, Frank G.	II.	1896
Logan, John W.	II.	1893	McCaw, Wallace E.	VI.	1892
Logngren, John E.	II.	1896	McConnell, George B.	I.	1890
Lootz, Alf C.	I.	1896	McGoodwin, Henry K.	IV.	1894
*Lord, Frank H. (Dec. 31, '90)	II.	1885	McJennett, William D.	X.	1894
Loring, Ernest J.	IV.	1895	McKenna, Alexander G.	V.	1891
Loring, Frederick R.	VII.	1879	McKibben, Frank P.	I.	1894
Loring, Harrison, Jr.	II.	1889	McKim, Alexander R.	I.	1886
Loring, Robert	X.	1894	*McLauthlin, G. V. (Aug. 14, '92)	V.	1888
Lotirop, Thomas M.	II.	1895	McManus, James T. R.	I.	1895
Lovejoy, Frank W.	X.	1894	McQuesten, George E.	VI.	1893
Loveland, James W.	V.	1888	Meade, Charles A.	I.	1894
Low, Albert H.	V.	1876	Melluish, James G.	IX.	1896
Low, John F.	V.	1882	Merrell, Charles G.	V.	1888
Low, Wilson H.	V.	1886	Merrell, Irving S.	II.	1896
Lowell, Guy	IV.	1894	Merriam, Harry B.	I.	1886
Lufkin, Elgood C.	II.	1886	Merriam, Henry P.	VI.	1886
Lukes, Joseph B.	VI.	1892	*Merrick, George E. (Apr. 23, '92)	V.	1890
*Lund, Amy Stantial (Feb. 11, '88)	V.	1884	Merrill, Allyne L.	II.	1885
Lund, James	V.	1881	*Merrill, Eben G. (Oct. 12, '87)	I.	1885
Lyle, David A.	III.	1884	Merrill, Frank H.	X.	1893
Lyman, George W.	VI.	1896	Merrill, George A.	XI.	1892
Lynch, Patrick M.	I.	1894	Merrill, N. Frederick	V.	1870
Lynde, James P.	IX.	1886	Merryweather, George E.	II.	1896
Lyon, Joseph P.	I.	1892	Merriss, George F. C.	I.	1895
Lyon, Tracy	II.	1885	Meserve, Charles A.	V.	1895
Lythgoe, Hermann C.	V.	1896	Messenger, William H.	II.	1892
MacClure, Colbert A.	IV.	1894	Metcalf, Arthur H.	II.	1879
Macfarlane, William W.	V.	1879	Metcalf, Frederick	II.	1890
MacKay, Angus R.	III.	1894	Metcalf, Leonard	I.	1892
MacRae, Hugh	III.	1885	*Meyer, Jos. A., Jr. (Dec. 20, '94)	IV.	1891
Mahony, Marion L.	IV.	1894	Mildram, Samuel H.	I.	1889
Main, Charles T.	II.	1876	Millen, Loring R.	III.	1880
Maki, Heichiro	VI.	1893	Miller, Edward F.	II.	1886
Maltby, Margaret E.	VIII.	1891	Miller, Edwin C.	II.	1879
Manahan, Elmer G.	XI.	1892	Miller, Franklin T.	XIII.	1895
Manahan, John H.	VI.	1896	Miller, Herbert S.	VI.	1892
Manley, Laurence B.	I.	1892	Miller, Lilly	V.	1892
Mann, Arthur S.	II.	1888	Miller, William T.	Elective.	1880
Mann, Bertram H.	VI.	1890	Mills, Arthur L.	I.	1876
Mann, Fred M.	IV.	1894	Minot, Charles S.	V.	1872
Manning, Harry G.	II.	1882	Mitchell, Benjamin M.	II.	1893
Mansfield, Arthur N.	VIII.	1891	Mitchell, Guy E.	II.	1891
Mansfield, Edward S.	VI.	1896	Mixer, Samuel J.	VIII.	1875
Mansfield, George W.	III.	1882	Moat, Charles P.	V.	1896

\* Deceased.

NAME.	COURSE.	CLASS.	NAME.	COURSE.	CLASS.
Moody, Burdett . . . . .	I.	1890	Ober, Arthur J. . . . .	I.	1892
Moody, Herbert R. . . . .	V.	1892	O'Grady, Marcella I. . . . .	IX.	1885
Moore, Frank A. . . . .	IV.	1888	Ordway, Evelyn W. . . . .	V.	1881
Moore, Fred F. . . . .	I.	1891	Otis, Hamilton . . . . .	I.	1892
Moore, Frederick Campbell . . . . .	X.	1892	*Owen, E. H., Jr. (July 3, '90) . . . . .	II.	1879
Moore, Frederick Clouston . . . . .	II.	1891	Owen, Fred B. . . . .	VI.	1896
Moore, Henry C. . . . .	II.	1888	Owen, G., Jr. . . . .	II.	1894
Moore, John D. J. . . . .	II.	1895	Oxford, George H. K. . . . .	VI.	1891
Moore, Leslie R. . . . .	V.	1894	Oxnard, Benjamin A. . . . .	III.	1875
Moore, Stephen W. . . . .	II.	1890	Packard, George A. . . . .	III.	1890
Moray, Richard . . . . .	I.	1895	Paine, Cecil E. . . . .	II.	1893
*Morgan, Frank H. (Dec. 5, '89) . . . . .	V.	1878	Palmer, William I. . . . .	VI.	1891
Morrill, Asa H. . . . .	I.	1892	*Paraschos, N. T. (Mar. 22, '93) . . . . .	I.	1892
Morris, Charles, Jr. . . . .	VI.	1896	Parce, Joseph Y., Jr. . . . .	II.	1893
Morrison, Frank C. . . . .	I.	1882	Park, Charles F. . . . .	II.	1892
Morse, Frank B. . . . .	I.	1873	Park, Franklin A. . . . .	II.	1895
Morse, Philip S. . . . .	III.	1884	Parker, Edwin M. . . . .	IV.	1894
Mors, Everett . . . . .	III.	1885	Parker, Theodore . . . . .	I.	1881
Mors, Henry A. . . . .	VI.	1893	Parker, Winthrop D. . . . .	IV.	1895
Moseley, Alexander W. . . . .	II.	1891	Parks, Oren E. . . . .	I.	1893
Mosman, Philip A. . . . .	III.	1887	Parmelee, Charles L. . . . .	I, XI.	1895
Mossman, William . . . . .	VI.	1891	Parrish, J. Scott . . . . .	II.	1892
Mott, William E. . . . .	I.	1889	*Parsons, Charles O. (Oct. 5, '94) . . . . .	III.	1873
Mower, George A. . . . .	II.	1881	Patch, Maurice B. . . . .	III.	1872
Mudge, Benjamin C. . . . .	I.	1877	Patch, Walter W. . . . .	I.	1894
Mulliken, Samuel P. . . . .	V.	1887	Patten, William F. . . . .	VI.	1895
Mumford, Edgar H. . . . .	II.	1886	Patterson, George W., Jr. . . . .	VI.	1887
Munroe, James P. . . . .	III.	1882	Pauly, Karl A. . . . .	VI.	1896
*Myrick, Willis H. (Oct. 17, '75) . . . . .	II.	1874	Peabody, Cecil H. . . . .	II.	1877
Nash, Luther R. . . . .	VI.	1894	Pearson, Edwin R. . . . .	VI.	1888
Neave, Charles . . . . .	VI.	1890	Pennell, Walter O. . . . .	VI.	1896
Nesbit, Arthur F. . . . .	VI.	1895	Perkins, Frank E. . . . .	IV.	1892
Nevin, Charles K. B. . . . .	IV.	1896	Perkins, Herbert B. . . . .	I.	1874
Newbegin, Parker C. . . . .	I.	1894	Perley, Clarence W. . . . .	VII.	1896
Newell, Allan H. . . . .	II.	1890	Perry, John C. . . . .	II.	1892
Newell, Frederick H. . . . .	III.	1885	*Peters, Quintard (Aug. 2, '94) . . . . .	IX.	1887
Newell, Herbert D. . . . .	I.	1896	Peterson, Charles A. . . . .	VI.	1888
Newell, John L. . . . .	X.	1895	Peyton, William R. . . . .	II.	1890
Newhall, Charles S. . . . .	III.	1896	Phelan, Joseph W. . . . .	V.	1894
Newhouse, Henry L. . . . .	IV.	1894	Phillips, George . . . . .	III.	1873
Newkirk, Walter M. . . . .	II.	1892	Phillips, Harry M. . . . .	II.	1893
Newman, Frank E. . . . .	IV.	1892	Phillips, Henry A. . . . .	IV.	1873
Nichols, Everell J. . . . .	I.	1878	Phillips, Henry M. . . . .	VI.	1892
Nichols, Henry W. . . . .	XII.	1893	Phipps, David W. . . . .	Phil.	1876
*Nichols, William R. (July 14, '86) . . . . .	V.	1869	Pickering, William H. . . . .	VIII.	1879
Nickerson, Addison D. . . . .	I.	1888	Pickernell, Frank A. . . . .	VI.	1885
Nickerson, William E. . . . .	V.	1876	Pickert, Leo W. . . . .	V.	1893
Nims, Norman G. . . . .	IV.	1890	Pierce, Arthur G. . . . .	VI.	1892
Noa, Frederic M. . . . .	IX.	1894	Pierce, Arthur W. . . . .	VI.	1892
Norris, Almon E. . . . .	II.	1890	Pierce, Edward L., Jr. . . . .	II.	1886
Norris, Clarence G. . . . .	I.	1890	Pierce, Herbert F. . . . .	I.	1888
Norris, George L. . . . .	III.	1887	Pierce, Richard H. . . . .	VI.	1885
Norris, Webster . . . . .	III.	1881	Pike, Clayton W. . . . .	VI.	1889
Norton, Charles L. . . . .	VI.	1893	*Pike, William A. (Oct., 1895) . . . . .	I.	1871
Norton, Francis C. . . . .	IX.	1893	Pillsbury, Joel H. . . . .	I.	1896
Norton, Fred E. . . . .	II.	1891	Pingree, Edwin D. . . . .	II.	1896
Nowell, John C. . . . .	VI.	1894	Piper, Walter E. . . . .	V.	1894
Noyes, Arthur A. . . . .	V.	1886	Plimpton, Arthur L. . . . .	I.	1877
Noyes, Harry L. . . . .	I.	1890	Plimpton, Thomas D. . . . .	II.	1875
Noyes, Joseph K. . . . .	I.	1890	Poland, William B. . . . .	I.	1890
Nute, Joseph E. . . . .	I.	1885	Pollock, Clarence D. . . . .	I.	1894
Nutter, Charles L. . . . .	II.	1893	Pond, Frank H. . . . .	II.	1874

\* Deceased.

NAME.	COURSE.	CLASS.	NAME.	COURSE.	CLASS.
Pool, George B. . . . .	VI.	1888	Ripley, William Z. . . . .	I.	1890
Pope, Macy S. . . . .	I.	1892	Ritchie, James . . . . .	I.	1878
Power, Charles W. . . . .	VI.	1889	Robb, Russell . . . . .	VI.	1888
Powers, Walter C. . . . .	X.	1895	Robbins, Arthur G. . . . .	I.	1886
Pratt, Dana M. . . . .	I.	1892	Robbins, Franklin H. . . . .	II.	1894
Pratt, George H. . . . .	V.	1871	Roberts, Edwin H. . . . .	II.	1896
Pratt, William H. . . . .	VI.	1894	Roberts, Harold B. . . . .	II.	1890
Prentiss, Frederick H. . . . .	II.	1878	Roberts, Odin B. . . . .	II.	1888
Prentiss, Wm. A. . . . .	Sci. and Lit.	1875	Roberts, William J. . . . .	I.	1891
Prescott, Charles O. . . . .	V.	1884	Robertson, Andrew R. . . . .	II.	1892
Prescott, Samuel C. . . . .	V.	1894	Robinson, C. Snelling . . . . .	III.	1884
Pressey, Harry A. . . . .	I.	1896	Robinson, Dwight P. . . . .	VI.	1892
Price, Raymond B. . . . .	X.	1894	Robinson, Edward . . . . .	II*	1890
Prichard, Charles F. . . . .	II.	1876	Robinson, Theodor W. . . . .	III.	1884
Proctor, Richard W. . . . .	V.	1894	*Robinson, Thos. W. (Nov. 3, '80)	III.	1876
Puffer, William L. . . . .	III.	1884	Rockwell, George A. . . . .	X.	1895
Pulsifer, Louis W. . . . .	IV.	1894	Rockwell, John A. Jr. . . . .	VII.	1896
Purinton, Arthur J. . . . .	II.	1884	Rogers, Allen H. . . . .	III.	1890
Putnam, John L. . . . .	VI.	1896	Rogers, Arthur S. . . . .	VI.	1894
Quevedo, Narciso T. . . . .	II.	1894	Rogers, Minnie H. . . . .	IX.	1890
Raeder, Henry . . . . .	I.	1876	Rollins, Edward W. . . . .	III.	1871
Ramsey, Allan . . . . .	VII.	1891	Rollins, James W., Jr. . . . .	I.	1878
Randall, Newbert M. . . . .	III.	1885	Root, William L. . . . .	X.	1896
Ranlett, Arthur G. . . . .	III.	1892	Roots, Willard H. . . . .	IX.	1891
Ranno, Fred W. . . . .	I.	1889	Rose, Frederick H. . . . .	II.	1891
Rawson, Harry D. . . . .	IV.	1896	Rosewater, William M. . . . .	II.	1892
Ray, J. Stites . . . . .	II.	1888	Ross, Henry F. . . . .	III.	1882
Raymond, Edward B. . . . .	VI.	1890	Ross, John H. . . . .	Sci. and Lit.	1882
Raynolds, James W. . . . .	III.	1896	Rotch, A. Lawrence . . . . .	II.	1884
Read, Carleton A. . . . .	II.	1891	Rounds, George W. . . . .	VI.	1889
Reed, James H., Jr. . . . .	VI.	1893	Rourke, Louis K. . . . .	I.	1895
Reed, Samuel G. . . . .	II.	1894	Rowell, George F. . . . .	I.	1892
Reed, Walter W. . . . .	VI.	1895	Ruckgaber, Albert F. . . . .	VI.	1896
Resor, William S. . . . .	VI.	1893	Ruggles, Horace F. . . . .	II.	1892
*Reynolds, George F. (Jan. 19, '91)	II.	1886	*Russel, Richard L. (July 31, '94)	I.	1889
Reynolds, Howard S. . . . .	VI.	1894	Russell, Andrew L. . . . .	IX.	1896
Reynolds, Robert D. . . . .	II.	1894	Russell, L. Kimball . . . . .	V.	1886
Rhodes, Frederick L. . . . .	VI.	1892	Rust, Harold N. . . . .	VI.	1895
Rice, Calvin W. . . . .	VI.	1890	Rutherford, Norman F. . . . .	VI.	1896
Rice, Carrie ( <i>see</i> Clark).			Ryder, Josiah P. . . . .	V.	1884
Rice, Harry L. . . . .	X.	1893	Sabine, Annie W. ( <i>see</i> Siebert).		
Rich, Charles L. . . . .	I.	1876	Sackett, Ward M. . . . .	VI.	1892
Rich, William J. . . . .	III.	1884	Sadtler, Samuel S. . . . .	V.	1895
Richards, Ellen H. . . . .	V.	1873	Safford, Frederick H. . . . .	VI.	1888
Richards, Franklin B. . . . .	III.	1884	Sage, Henry J. . . . .	VI.	1892
Richards, Frederick L. . . . .	X.	1895	Sager, Lawrence K. . . . .	VI.	1896
Richards, Robert H. . . . .	III.	1868	Sager, Oscar F. . . . .	II.	1892
Richards, Thomas G. . . . .	II.	1894	Sanborn, Clifford B. . . . .	IX.	1895
Richardson, Charles F. . . . .	II.	1886	Sanborn, Frank E. . . . .	II.	1889
Richardson, Daniel A. . . . .	II.	1896	Sanderson, Nathan H. . . . .	I.	1896
Richardson, Frank D. . . . .	II.	1893	Sargent, Albert F., Jr. . . . .	I.	1892
Richardson, George L. . . . .	I.	1889	Sargent, Francis T. . . . .	II.	1875
Richardson, Herbert A. . . . .	V.	1887	Sargent, Welland F. . . . .	I.	1875
Richardson, William C. . . . .	II.	1891	*Saunders, Robert T. (Sept. 15, '96)	I.	1892
Richmond, Harold A. . . . .	II.	1893	Sauveur, Albert . . . . .	III.	1889
Richmond, Knight C. . . . .	II.	1890	Savage, S. Anthony . . . . .	II.	1894
Ricker, Charles W. . . . .	VI.	1891	Sawin, Charles D. . . . .	Sci. and Lit.	1878
Rickey, Walter J. . . . .	II.	1895	Sawyer, Albert H. . . . .	IX.	1894
Riggs, George F. . . . .	I.	1879	Sawyer, Alfred H. . . . .	II.	1888
Ripley, Henry F. . . . .	II.	1894	Sawyer, Charles A. . . . .	Sci. and Lit.	1876
Ripley, Henry L. . . . .	I.	1873	Sax, Moritz . . . . .	IV.	1896
*Ripley, William T. (Aug. 26, '93)	II.	1882	Sayer, Frederick L. . . . .	II.	1888

\* Deceased.

NAME.	COURSE.	CLASS.	NAME.	COURSE.	CLASS.
Sayward, William H., Jr.	VII.	1894	Smith, George A.	V.	1883
Schaller, Frederick F.	VI.	1896	Smith, Harry E.	V.	1887
Schiertz, Ferdinand A.	III.	1894	Smith, Herbert E.	IV.	1896
Schmidt, Louis	V.	1890	Smith, Howard E.	XI.	1896
Schlitz, Frank C.	I.	1895	Smith, J. Waldo	I.	1887
Schoentgen, Edward P.	IV.	1895	*Smith, Walter W. (July 30, '96)	II.	1871
Schwamb, Pete	II.	1878	Smith, William L.	VI.	1890
Schwarz, Franz H.	II.	1887	Smyser, Albert E.	II.	1896
Schwarz, Theodore E.	III.	1876	Smyser, Frederick W.	II.	1896
Scofield, Donald C.	IV.	1896	Smyser, James S.	II.	1896
Scott, Robert W.	II.	1883	Snead, William R.	IV.	1881
Scott, Walter O.	V.	1894	Snelling, Grenville T.	IV.	1882
Scovell, John C., Jr.	II.	1896	Snow, Walter B.	II.	1882
Sears, Henry D.	VI.	1887	Snow, William G.	II.	1889
Sears, Henry K.	IX.	1896	Snyder, Frederick T.	V.	1891
Sears, Mortimer A.	III.	1896	Soley, William A.	III.	1894
Sears, Walter H.	I.	1868	Solomon, John I.	VI.	1893
Seavey, John F.	II.	1886	Sonnemann, George A.	III.	1890
Selfridge, Russell	IX.	1892	Soule, Richard H.	II.	1872
Shailer, Robert A.	I.	1873	Southard, Francis M.	V.	1894
Shattuck, A. Forrest	V.	1891	Souther, Henry, Jr.	III.	1887
Shaw, Edward S.	I.	1874	Southworth, Harry C.	III.	1877
Shaw, Walter K.	II.	1888	Southworth, Martin O.	VI.	1890
Shed, Nathaniel W.	V.	1881	Spalding, Frederic P.	I.	1878
Shepard, Edward V.	I.	1889	Spaulding, Henry P.	VI.	1892
Shepard, Frank E.	II.	1887	Spaulding, Hollon C.	II.	1887
Shepard, George F., Jr.	IV.	1896	Speer, J. Ramsey	II.	1893
Shepard, Walter	I.	1872	Spencer, Theodore	VI.	1891
Shepard, William E.	VI.	1886	Sperry, Austin	II.	1894
Shepherd, Frank C.	XI.	1892	Spofford, Charles M.	I.	1893
Sheppard, Robert K.	X.	1895	Spooner, George H.	VI.	1891
Sheridan, Richard G. B.	XIII.	1895	Sprague, Timothy W.	III.	1887
Sherman, Adelaide	V.	1890	Stafford, C. Edward	III.	1873
Sherman, Charles W.	I.	1890	*Stantial, Amy M. (see Lund).		
Sherman, George W.	X.	1894	Stantial, Frank G.	V.	1879
Sherman, John C.	VI.	1895	Stantial, Otis T.	III.	1885
Sherman, LeRoy K.	I.	1892	Stanwood, James B.	II.	1875
Shockley, William H.	III.	1875	*Stanwood, James H. (May 24, '96)	I.	1887
Shute, Harry D.	VI.	1892	Stearns, Harold E.	II.	1881
Shurtleff, Arthur A.	II.	1894	Stearns, Walter M.	VI.	1896
Siebert, Annie W.	VIII.	1888	Stearns, William S.	I.	1879
Silsbee, Francis H.	II.	1874	Stebbins, Alfred, Jr.	III.	1884
Simmons, Alfred L.	I.	1895	Stebbins, Theodore	VI.	1886
Simor's, Frederic P.	IV.	1894	Stetson, Frank O.	V.	1888
Simpson, Edmund T.	V.	1890	Stevens, Harold C.	I.	1896
Simpson, James E.	III.	1886	Stevens, John C.	XI.	1894
Sjöström, Ivar L.	I.	1888	Stevens, Walter F.	II.	1895
Skinner, Fenwick F.	I.	1893	*Stewart, Charles E. (Oct. 7, '77)	I.	1877
Skinner, Theodore H.	IV.	1892	Stickney, Delia	V.	1889
Slater, Howard C.	II.	1890	Stickney, Joseph W.	VI.	1896
Sloan, Alfred P., Jr.	VI.	1895	Stimpson, Thomas F.	III.	1877
*Small, Nathaniel C. (July 14, '80)	V.	1880	Stix, Solomon H.	IV.	1891
Smalley, Frank N.	V.	1896	Stoddard, Arthur B.	V.	1891
Smetters, Samuel T.	I.	1896	Stoddard, Henry F.	II.	1887
Smith, A. Blakeley	IX.	1893	Stone, Charles A.	VI.	1888
Smith, Arthur C.	V.	1892	Stone, Charles F.	III.	1871
*Smith, Charles A. (Feb. 4, '84)	I.	1868	Stone, Charles H. H.	V.	1896
Smith, Charles P.	II.	1887	Stone, Esther	IV.	1896
Smith, Clarence W.	V.	1888	*Stone, G. Goodwin (Mar. 4, '93)	III.	1889
Smith, Edward M.	II.	1888	Stone, Joseph	I.	1868
Smith, Fred H.	X.	1896	Storrow, Samuel	I.	1890
Smith, Frederick D.	I.	1893	Story, Isaac M.	I.	1878

\* Deceased.

## ALPHABETICAL LIST OF GRADUATES.

289

NAME.	COURSE.	CLASS.	NAME.	COURSE.	CLASS.
Stose, George W.	I.	1893	Tidd, Arthur W.	I.	1894
Stoughton, Augustus B.	II.	1886	Tidd, Winthrop L.	II.	1893
Stoughton, Bradley	III.	1896	Tilden, Bryant P.	III.	1868
Stowe, Lovell B.	VI.	1893	Tilley, John	VI.	1896
Studley, Fred B.	VI.	1893	Tillinghast, Charles F.	II.	1895
Sturges, Benton	IX.	1890	Tillinghast, Theodore F.	I.	1870
Sturgis, Elliot T.	III.	1884	Tinkham, Samuel E.	I.	1873
Sturm, Meyer J.	IV.	1896	Tolman, James P.	III.	1868
Sturtevant, Thomas J.	VI.	1890	Tomfohrde, John F.	II.	1893
Sully, John M.	III.	1888	Tompkins, Charles H., Jr.	III.	1883
Sumner, George W.	VI.	1896	Torossian, Toros H.	I.	1894
Susmann, Julius H.	III.	1876	Towne, John H.	IX.	1890
Sutter, Frederick C.	VI.	1893	Towne, Linwood O.	III.	1878
Swain, George F.	I.	1877	Towne, Walter I.	VI.	1888
Swallow, Ellen H. (see Richards).			Townsend, Walter D.	III.	1876
Swan, James	II.	1891	Tozier, Henry H.	V.	1896
Swanton, Frederick W.	VI.	1890	Tripp, Charles A.	VI.	1893
Swanton, Henry A.	II.	1894	Trout, Charles E.	I.	1895
Swanton, Walter I.	I.	1893	*Trowbridge, A., Jr. (Dec. 5, '78)	II.	1871
Sweet, Kilburn S.	I.	1893	Trowbridge, Walter B.	II.	1892
Sweetland, Ralph	II.	1889	Truesdell, Arthur E.	VI.	1889
*Sweetser, Arthur W. (Apr. 10, '78)	I.	1874	Tucker, Charles W.	V.	1896
Sweetser, Ralph H.	III.	1892	Tucker, Edward A.	I.	1895
Swift, William E.	I.	1895	Tucker, Greenleaf R.	V.	1887
Swope, Gerard	VI.	1895	*Tucker, H. Judson (Aug. 17, '95)	VI.	1887
Sykes, Henry H.	VI.	1891	Tucker, Hugh M.	II.	1895
Taber, George A.	I.	1894	Tucker, Ross F.	IV.	1892
Taft, Charles C.	X.	1895	Tucker, William A.	III.	1893
Taft, Harrison S.	II.	1896	Turnbull, Charles D.	II.	1886
Taintor, Charles W.	VI.	1893	Turner, Edmund K.	I.	1870
Taintor, Giles	VI.	1887	Twombly, Alexander H.	II.	1887
Talbot, Henry P.	V.	1885	Tyler, Alice Brown	V.	1884
Talbot, Marion	IX.	1888	Tyler, Clifford M.	II.	1891
Tallant, George P.	IX.	1892	Tyler, Harry W.	V.	1884
*Taney, Edmund (May 1, '90)	I.	1878	Underhill, Arthur P.	VI.	1896
Tappan, Lewis H.	II.	1896	Underhill, William W.	II.	1889
Taylor, Charles M.	II.	1893	Underwood, George R.	V.	1883
Taylor, George	II.	1894	Vaillant, George W.	III.	1892
Taylor, Harry B.	V.	1891	Van Alstine, David	II.	1886
Taylor, Robert R.	IV.	1892	Van Everen, Grace A.	V.	1896
Taylor, William B.	II.	1896	Vanier, George P.	III.	1885
Taylor, William M.	II.	1886	Varney, Theodore	VI.	1894
Tenney, Albert B.	II.	1894	Verges, Luis F.	I.	1891
Tenney, Frank	III.	1883	Very, Frank W.	V.	1873
Tenney, Winthrop P.	VI.	1893	Vielé, Francis S.	VI.	1891
Thalheimer, William C.	I.	1892	Vielé, Maurice A.	II.	1886
Thanisch, Frank A.	III.	1896	Vining, John F.	IV.	1892
Thomas, Alfred C.	VI.	1893	Vining, Louis B.	VI.	1893
Thomas, Edward G.	II.	1887	von Holst, Hermann V.	IV.	1896
Thomas, James W.	II.	1895	Vorce, Clarence B.	I.	1888
Thomas, Percy H.	VI.	1893	Vose, Ralph	VI.	1887
Thompson, Albert W.	II.	1896	Wadsworth, Augustus B.	VII.	1893
Thompson, Frederick	I.	1887	Wait, Henry H.	VI.	1891
Thompson, Herbert A.	VIII.	1891	Waite, Charles N.	V.	1876
Thompson, Sanford E.	I.	1889	Waite, Loren G.	VI.	1895
Thompson, Walter S.	I.	1887	Waite, Arthur M.	II.	1879
Thomson, Lucy D.	IV.	1896	Waite, Henry M.	I.	1876
Thomson, Samuel F.	I.	1896	Waldron, S. Payson	I.	1893
Thorndike, Sturgis H.	I.	1895	Wales, Thomas C., Jr.	VI.	1892
Thorp, Frank H.	V.	1889	Walker, Charles R.	V.	1893
Thropp, Joseph E., Jr.	III.	1894	Walker, Elton D.	I.	1890
Thurber, William B.	IX.	1889	Walker, Francis	IX.	1892

\* Deceased.

## ALPHABETICAL LIST OF GRADUATES.

NAME.	COURSE.	CLASS.	NAME.	COURSE.	CLASS.
Walker, George L.	I.	1893	Whitney, William M.	II.	1884
Walker, Robert T.	IV.	1890	Whitney, Willis R.	V.	1890
Wall, William G.	VI.	1896	Whitten, William H., Jr.	VIII.	1896
Wallace, Charles F.	VI.	1892	Whittier, Randal.	I. 1873.	V. 1871
Wallace, Frederic A.	II.	1893	*Wiggin, Frank E. (Dec. 21, '90)	I.	1877
Wallis, Robert N.	IX.	1893	Wiggin, Thomas H.	I.	1895
Walton, Evelyn M. (see Ordway).			Wilcox, Herbert A.	III.	1887
Walworth, Joseph E.	V.	1895	Wilder, C. Morris	VI.	1886
Ward, Clarence S.	III.	1872	Wilder, Parker H.	VI.	1893
Ward, Nahum	V.	1884	Wilder, Stephen H.	Sci. and Lit.	1874
*Ware, Robert C. (June 25, '83)			Wilder, Salmon W., Jr.	X.	1891
Phil. 1876, Sci. and Lit.		1874	Wilkes, Charles M.	IV.	1881
Warner, Charles H.	VI.	1889	Willard, Daniel W.	II.	1870
Warner, George M.	VI.	1891	Williams, Arthur S.	VI.	1888
Warner, Murray	II.	1892	Williams, Charles G.	I.	1895
Warren, A. Sydney	III.	1888	Williams, Emile F.	I.	1878
Warren, Edward R.	VII.	1881	Williams, Francis C., Jr.	I.	1884
Warren, Henry E.	VI.	1894	Williams, Francis H.	V.	1873
Warren, H. L. J.	III.	1875	Williams, Robert C.	III.	1880
Warren, Joseph A.	XI.	1892	Williams, Roger J.	IX.	1895
Wason, Leonard C.	VI.	1891	Williams, Sidney	I.	1887
Wason, Rigby	VI.	1894	Williams, Walter S.	X.	1895
Wason, Robert S.	V.	1896	Willis, John H.	IV.	1896
Waterman, Charles C.	VI.	1892	Williston, Arthur L.	II.	1889
Waterman, Harry C.	IV.	1893	Wilson, Arthur R.	I.	1890
Waterman, Henry A.	II.	1895	Wilson, Elwood J.	III.	1886
Waterman, Richard, Jr.	IX.	1892	Wilson, Fred A.	II.	1891
Watkins, Willard H.	V.	1895	Windett, Victor	II.	1889
Wayne, Jacob L.	VI.	1896	Winkley, William H.	XIII.	1895
Webb, Henry S.	VI.	1892	Winslow, Arthur	III.	1881
Webster, Edwin S.	VI.	1888	Wolfe, John J. C.	II.	1895
Webster, William R.	III.	1875	*Wood, Charles (Nov. 28, '95)	I.	1886
Weed, Henry T.	V.	1891	Wood, Charles H.	II.	1891
Weeks, Isaiah S. P.	I.	1871	Wood, Frederick W.	III.	1877
Weil, Charles L.	II.	1888	Wood, Henry B.	I.	1876
Wells, Albert J.	II.	1896	Wood, Kenneth F.	II.	1894
Wells, Edward C.	II.	1892	Wood, Louis F.	V.	1873
Wells, Webster	I.	1873	Wood, Willett A.	VI.	1896
Wendell, George V.	VIII.	1892	Woodbridge, Jonathan E.	VI.	1893
Wentworth, Charles A.	I.	1896	Woodbury, Charles H.	II.	1886
Wesson, David	V.	1883	Woodman, Andrew W.	I.	1890
Westcott, Frank T.	I.	1892	Woodman, Caroline A.	VII.	1889
Westcott, William R.	VI.	1894	Woods, Henry T.	II.	1893
Weston, David B.	V.	1895	*Woodward, A. E. (Sept. '91)	III.	1888
Weston, William H.	III.	1891	Woodwell, Julian E.	II.	1896
Wetherbee, Charles P.	II.	1891	Woolworth, James G.	V.	1878
Wheeler, Ralph N.	I.	1895	Worcester, Vernor F.	II.	1886
Wheeler, Robert C.	I.	1894	Worthington, Arthur M.	VII.	1892
Whipple, George C.	I.	1889	Worthington, Erastus, Jr.	I.	1885
Whitaker, Channing	II.	1869	Wrightington, C. Nelson	II.	1894
Whitaker, S. Edgar	VI.	1893	Wrinkle, Laurence F. J.	III.	1870
White, Anne E. (see Carpenter).			Wuichet, Walter G.	II.	1889
*White, A. C. (Dec. 27, '93)	VIII.	1882	Yoder, Luther K.	II.	1895
White, Franklin W.	VII.	1890	Yoerg, Henry	II.	1895
Whiting, Jasper	III.	1889	Yorke, George M.	VI.	1893
Whitmore, Walter G.	VI.	1887	Young, Conrad H.	II.	1896
Whitney, Frank P.	VI.	1889	Young, Fred R.	III.	1886
Whitney, Granger	III.	1887	Young, John E.	I.	1888
Whitney, Lambert N.	VI.	1896	Zapl, Alfred E.	IV.	1895
Whitney, William A.	I.	1887			

\* Deceased.

## Titles of Theses

OF SUCCESSFUL CANDIDATES FOR GRADUATION,  
JUNE, 1896.

---

### Candidates for the Degree of Master of Science.

FRANK AUGUSTUS BOURNE, S.B.

A Study for the Architectural Improvement of the Water Front of Boston Harbor, Illustrated by a Design for "A Free Port of Boston."

HERBERT W. CHAMBERLAIN, S.B.

A Study of the Growth and Influence of the Renaissance Architecture of Venice. Original Design.

GEORGE DEFREN, S.B.

- I. The Estimation of Reducing Sugars in Terms of Cupric Oxide.
  - II. The Hydrolysis of Starch by Acids.
- 

### Candidates for the Degree of Bachelor of Science.

BUTLER AMES,

Tests on the Morse Rotary Steam Engine.

WILLIAM POPE ANDERSON, JR.

Milling and Concentration Tests of a Lead Ore from Missouri.  
(*With C. S. Newhall.*)

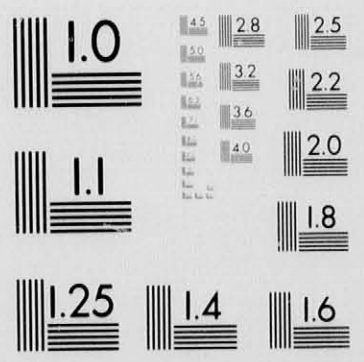
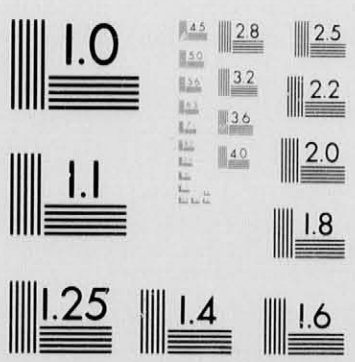
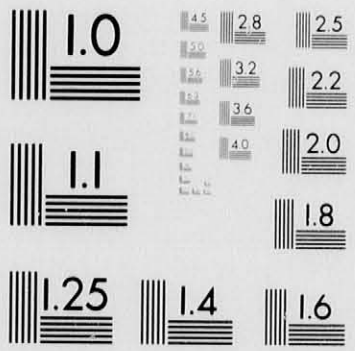
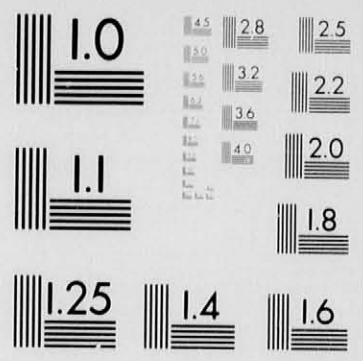
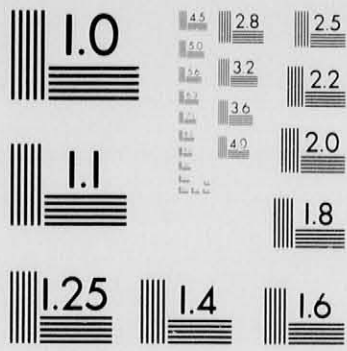
WILLIAM McCORKLE ANDREW,

The Effects of Variation of Temperature on Insulation Resistance.  
(*With J. L. Wayne.*)

GEORGE FRANCIS ASHTON,

The Determination of the Variation in the Density of Steel under Stress. (*With H. Gardner.*)





M. I. T. ANNUAL CATALOGUES AND BULLETINS

1896/97

04 OF 04

- ERNEST CARLTON ATKINS,  
A Study of Flue Gases. (*With F. H. Smith.*)
- THOMAS WARD BAILEY,  
A Design for a Steel Dome.
- REUBEN EDWIN BAKENHUS,  
A Study and Design of a Profile for a High Masonry Dam.
- EDWARD ARTHUR BALDWIN,  
An Efficiency Test of the Electric Plant of the Waltham Gas &  
Electric Light Co. (*With W. M. Stearns.*)
- CHARLES EILDERMANN BATCHELDER,  
A Study of a Method for Obtaining the Wave-Form of an Electric  
Current. (*With G. W. Sumner.*)
- DANIEL MOORE BATES, Jr.  
A Practical Investigation of Bleaching of Cotton Cloth by the  
Mather Kier.
- DAVID WEBSTER BEAMAN,  
A Test of the Sprague Railway Motor. (*With L. B. Breed.*)
- FRANCIS POLK BLAKE,  
A Concentration Test upon a Sample of Coal from Colburn, Va.,  
with Experiments Determining the Exact Amount of Slate  
Present.
- GEORGE SIDNEY BOWES,  
A Design of a Warping Machine.
- AUGUSTUS JESSE BOWIE, A.B.  
II. A Test of a 150 Horse-Power Gas Engine of the Brookline Gas  
Co. (*With P. W. Litchfield.*)  
VI. A Test of a Three-Phase Rotary Transformer Plant of the  
Lowell Street Railway Co.
- EDWIN RAYMOND BRACKETT,  
The Synthesis of Polyethyl Toluenes. (*With J. H. Haste.*)
- EDWARD MILTON BRAGG,  
The Use of a Small Model for Determination of Stability. (*With  
W. S. Leland.*)
- LEWIS BAZZONI BREED,  
A Test of the Sprague Railway Motor. (*With D. W. Beaman*)
- JOHN FLAVEL BROOKS,  
A Test of a Sewerage Pumping Plant. (*With H. A. Waterman*)

- HARRY WEBSTER BROWN,  
Tests of a General Electric Three-Phase Motor. (*With J. G. Callan.*)
- HARRY PATRICK BROWNE,  
An Investigation of the Disruptive Effect upon Insulation of Alternating Currents of High Potential and Low Frequency. (*With W. H. Keith.*)
- RUSSELL SAMUEL BUCHER,  
A Small Court House.
- GEORGE KIMBALL BURGESS,  
Osmotic Pressure Measurements and the Validity of Avogadro's Law as Applied to Solutions.
- JOHN GURNEY CALLAN,  
Tests of a General Electric Three-Phase Motor. (*With H. W. Brown.*)
- LEWIS TELLE CANNON,  
A Building for a Police Station and Fire Department.
- HELEN CHAMBERLIN,  
A Country Inn.
- HAROLD MAYSON CHASE, S.B.  
Some Derivatives of Trimethylene Glycol.
- WINTHROP HOLT CHENERY,  
A College Building.
- JOSEPH WARD CLARY,  
Determination of Resistance and Distribution of Power of a Steam Launch.
- ALBERT EDMUND CLUETT, A.B.  
A Study of a Weston Dynamo. (*With H. M. Crane.*)
- JOHN LONSON COLEY,  
Tests on an Induced Draft Apparatus. (*With G. E. Merryweather.*)
- WILLARD HENRY COLMAN,  
Tests on a 1200 Horse-Power Battery of Stirling Boilers at the Waltham Bleachery and Dye Works. (*With J. E. Lonngren.*)
- FRANCIS MELVIN CONANT,  
An Investigation of the Stretch and Strength of Cotton Cloth. (*With J. Harrington.*)

WILLIAM DAVID COOLIDGE,

Variations of Hysteresis with Temperature. (*With L. D. P. Dickinson.*)

WINTHROP COOLIDGE,

Some Experiments upon the Electrolytic Deposition of Antimony and Arsenic with Metallic Copper. (*With F. H. Davis.*)

EDWIN CLAASSEN CRAMER,

A Memorial Building — containing besides a Memorial Hall, a Library, a Theatre, a Concert Hall, a Swimming-Bath, and a Gymnasium.

HENRY MIDDLEBROOK CRANE, S.B.

A Study of a Weston Dynamo. (*With A. E. Cluett.*)

STEPHEN DOW CRANE,

A Study of a Method for the Harmonic Analysis of Alternating Current Waves. (*With R. S. Hardy.*)

CARL IRA CROCKER,

A Design for a Viaduct with Rocking Columns.

RALPH WORTHINGTON CROSBY,

A Design for a Ninety-Foot Racing Sloop.

HENRY CUMMINGS, Jr.

A High School.

NATHAN HAGAR DANIELS, Jr.

A Series of Electric Car Tests. (*With W. M. Hollis*)

FRANKLIN HAYES DAVIS,

Some Experiments upon the Electrolytic Deposition of Antimony and Arsenic with Metallic Copper. (*With W. Coolidge.*)

ROBERT ALLEN DAVIS,

An Investigation of the Stray Power Variations of a Three Horse-Power Holtzer-Cabot Motor. (*With A. L. Drum.*)

HAROLD WILLIAMS DELONG,

A Comparison of Two Types of Naval Engines.

LEONARD DAVID PERLEY DICKINSON,

Variations of Hysteresis with Temperature. (*With W. D. Coolidge.*)

WILLIAM TULLY DORRANCE, A.B.

A Plan for the Separation of Railroad and Highway Grades at Sharon, Mass. (*With M. S. Jameson.*)

- JAMES MICHAEL DRISCOLL,  
A Design for the Improvement of Hutchins Avenue, Roxbury, including an Estimate of the Cost.
- JOSEPH DRISCOLL,  
A Design for a Stone Bridge over the Parkway at Longwood Avenue, Brookline, Mass.
- ALPHONSUS LIGOURI DRUM,  
An Investigation of the Stray Power Variations of a Three Horse-Power Holtzer-Cabot Motor. (*With R. A. Davis.*)
- FREDERICK EUBERT FIELD,  
A Design for a System of Sewerage and Sewage Disposal for the Town of Norwood, Mass. (*With Howard E. Smith.*)
- ELIZABETH FLORETTE FISHER,  
The Geological History of Lake Cochituate.
- HARRY GEORGE FISK,  
An Anthropological Study based upon Observations of Complexion and Cephalic Measurements of Students at the Massachusetts Institute of Technology. (*With J. G. Melliush.*)
- FREDERICK EVERARD FORSTER,  
A Comparison of the Doolittle and the Saybolt Viscosimeters.
- GEORGE FRESCH, Jr.  
A Municipal Market and Exchange.
- MYRON LESLIE FULLER,  
Character and Genesis of Acid Pegmatite.
- ROBERT LESURE FULLER,  
Chapter House for a College Fraternity.
- STEPHEN DEMERITTE GAGE,  
Experiments on the Influence of Salts on the Solubilities of Other Salts.
- HENRY GARDNER,  
The Determination of the Variation in the Density of Steel under Stress. (*With G. F. Ashton.*)
- ABRAM GARFIELD, A.B.  
A Board of Trade Building.
- LEONARD HARRINGTON GOODHUE,  
The Preparation of Hexamethylene Diethyl Ether.

EDWARD BERTELLE GORDON, Jr.

Tests on the Strength of Notched Timber Beams. (*With W. H. James.*)

AMADEUS WILLIAM GRABAU,

Characteristics and Succession of the Fossil Faunas of the Middle Devonian (Hamilton) at Eighteen Mile Creek, N. Y.

ANDREW HUGH GREEN, A.B.

A Design for a Dredge Boom.

NATHAN CLIFFORD GROVER, B.C.E.

A Design for a Steel Highway Bridge.

HENRY GRANVILLE GRUSH,

An Investigation of the Sensitiveness of a Magneto Telephone Receiver. (*With F. E. Guptill.*)

FRANK EDWARD GUPTILL,

An Investigation of the Sensitiveness of a Magneto Telephone Receiver. (*With H. G. Grush.*)

WALTER ATWOOD HALL,

A Commercial Test of Engines and Dynamos in the Boston Public Library. (*With T. I. Jones.*)

JOHN SANFORD HALLARAN,

A Study of the Pitot Tube.

CHARLES WARREN HAPGOOD,

The Action of Acids on the Velocity of the Reaction between Potassium Iodide and Potassium Bromate.

ROBERT SAMUEL HARDY,

A Study of a Method for the Harmonic Analysis of Alternating Current Waves. (*With S. D. Crane.*)

GEORGE EDWARD HARKNESS,

A Study of the Variations in the Flow of Sewage.

JOSEPH HARRINGTON,

An Investigation of the Stretch and Strength of Cotton Cloth. (*With F. M. Conant.*)

HIRAM BRITTON HARTWELL,

Tests on a Mogul Locomotive.

JAMES HENRY HASTE,

The Synthesis of Polyethyl Toluenes. (*With E. R. Brackett.*)

- HARVEY F HAWLEY,  
A Study of the Boynton Bicycle Railway.
- HARRISON WASHBURN HAYWARD,  
Some Investigations as to the Effect of Oleate of Alumina upon  
Paraffine Oil.
- HENRY ROGERS HEDGE,  
A Statistical Investigation of the Nativity, Age, Occupation, and  
Legislative Experience of Members of the United States Con-  
gress since 1876. (*With W. R. Hedge.*)
- WILLIAM RUSSELL HEDGE,  
A Statistical Investigation of the Nativity, Age, Occupation, and  
Legislative Experience of Members of the United States Congress  
since 1876. (*With H. R. Hedge.*)
- FREDERICK MORSE HEERMANN,  
A design of an Apparatus for Testing Full-Size Brick and Stone  
Arches. (*With E. D. Pingree.*)
- JAMES BUIST HENDERSON,  
A Study of the Frictional Resistance of Shafting.
- RALPH COOLIDGE HENRY,  
Study for a Private House.
- JOSEPH HEWETT,  
The Electro-Magnetic Rotation of Solutions.
- WALTER MUNROE HOLLIS,  
A Series of Electric Car Tests. (*With N. H. Daniels, Jr.*)
- JAMES CLEVELAND HOPKINS,  
A Terminal Railway Station.
- FRANK ALLEN HOWARD,  
A Project for an Electric Street Railway between Brockton and  
Taunton, Mass. (*With J. H. Pillsbury.*)
- JOSEPH MILTON HOWE,  
A Study of the Methods of Laying Submerged Pipe Lines.
- EUGENE CHRISTIAN HULTMAN,  
A Plan for the Consolidation of the Passenger Traffic of the Boston  
& Albany and the Providence Division of the New York, New  
Haven, & Hartford Railroads at Park Square.
- BENJAMIN HURD,  
A Study of an Electric Crane.



- CHARLES GILMAN HYDE,  
A Plan for Sewerage and Sewage Disposal in the Town of Needham,  
Mass. (*With W. H. McAlpine.*)
- CHARLES HENRY INGALLS,  
Investigation of a Lundell Three Horse-Power Direct Current Motor.  
(*With G. W. Lyman.*)
- WALTER HERMAN JAMES,  
Tests on the Strength of Notched Timber Beams. (*With E. B.  
Gordon, Jr.*)
- MINOR STORY JAMESON,  
A Plan for the Separation of Railroad and Highway Grades at  
Sharon, Mass. (*With W. T. Dorrance.*)
- HOWARD KINGSLEY JONES,  
A Theatre for a Small Town.
- THEODORE INSLEE JONES,  
A Commercial Test of Engines and Dynamos in the Boston Public  
Library. (*With W. A. Hall.*)
- WILLIAM HENRY KEITH,  
An Investigation of the Disruptive Effect upon Insulation of Alternating  
Currents of High Potential and Low Frequency. (*With  
H. P. Browne.*)
- JOSEPH HYDE KNIGHT,  
Methods of Encouraging Immigration to the United States.
- LEE BERT LLOYD LAMPORN, B.S.  
The Action of Bromine and Iodine upon Certain Fatty Amines.
- CHARLES EDWARD LAWRENCE, B.A.  
Test of Quarter-Phase Transmission Plant of Simonds Manufacturing  
Co., Fitchburg, Mass. (*With A. P. Underhill.*)
- EUGENE HIRAM LAWS,  
The Action of the Halogens on Dimethylamine.
- MARSHALL ORA LEIGHTON,  
A Study of the Duration of Heart-Standstill with Minimal and  
Supra-Minimal Vagus Stimulation.
- WALTER SWIFT LELAND,  
The Use of a Small Model for Determination of Stability. (*With  
E. M. Bragg.*)

- MARION LINCOLN LEWIS,  
A Clubhouse for Women.
- PAUL WEEKS LITCHFIELD,  
A Test of a 150 Horse-Power Gas Engine of the Brookline Gas Co.  
(*With A. F. Bowie, Jr.*)
- CHARLES E. LOCKE,  
A Study of a Spitzkasten.
- JOHN ERIK LONNGREN,  
Tests on a 1200 Horse-Power Battery of Stirling Boilers at the  
Waltham Bleachery and Dye Works. (*With W. H. Colman.*)
- ALF C LOOTZ,  
A Plan for the Further Development of the Water-Power of the  
Connecticut River at Turner's Falls, Mass. (*With S. T. Smet-  
ters.*)
- GEORGE WILLIAM LYMAN,  
An Investigation of a Lundell Three Horse-Power Direct Current  
Motor. (*With C. H. Ingalls.*)
- HERMANN CHARLES LYTHGOE,  
The Condensation Products and Basicity of Benzenesulphinic Acid.
- JOHN HENRY MANAHAN,  
A Series of Tests of two 400 K. W. Direct Driven Dynamos and  
1500 Horse-Power Engine in Use by the Edison Electric Illumin-  
ating Co., of Boston. (*With E. S. Mansfield.*)
- EDWARD STACEY MANSFIELD,  
A Series of Tests of two 400 K. W. Direct Driven Dynamos and  
1500 Horse-Power Engine in Use by the Edison Electric Illumin-  
ating Co., of Boston. (*With F. H. Manahan.*)
- WILLIAM HORATIO McALPINE,  
A Plan for Sewerage and Sewage Disposal in the Town of Need-  
ham, Mass. (*With C. G. Hyde.*)
- FRANK GOODMAN McCANN,  
A Determination of the Effect of Rate of Flow of Air over Steam-  
Pipes on Rate of Steam Condensation therein.
- JAMES GEORGE MELLUISH,  
An Anthropological Study based upon Observations of Complexion  
and Cephalic Measurements of Students at the Massachusetts In-  
stitute of Technology. (*With H. G. Fisk.*)
- IRVING SEWARD MERRELL,  
An Efficiency Test on a Coal Conveyor Plant.

- GEORGE EDMUND MERRYWEATHER,  
Tests on an Induced Draft Apparatus. (*With J. L. Colzy.*)
- CHARLES PERKINS MOAT,  
The Action of Heat on a Mixture of Acetylene and Oxygen.
- CHARLES MORRIS, Jr.  
Tests of the Efficiency of Commercial Incandescent Lamps. (*With W. G. Wall.*)
- CHARLES KIRKLAND BARKER NEVIN,  
A Small Railroad Station on Two Levels.
- HERBERT DAMON NEWELL,  
A Design for a System of Water Works for Warren, Mass. (*With H. A. Pressey.*)
- CHARLES SAUNDERSON NEWHALL,  
Milling and Concentration Tests of a Lead Ore from Missouri. (*With W. P. Anderson, Jr.*)
- FRED BROWN OWEN,  
Tests of Blowers. (*With W. A. Wood.*)
- KARL ALMON PAULY,  
A Study of the Heating Effect in Resistance Coils.
- WALTER OTIS PENNELL,  
An Investigation of Certain Alternating Current Phenomena. (*With L. N. Whitney.*)
- CLARENCE WARNER PERLEY,  
A Comparative Study of the Efficiency of the Pressed Yeasts Sold in Boston.
- JOEL HORACE PILLSBURY,  
A Project for an Electric Street Railway between Brockton and Taunton, Mass. (*With F. A. Howard.*)
- EDWIN DANIEL PINGREE,  
A Design of an Apparatus for Testing Full-Size Brick and Stone Arches. (*With F. M. Heermann.*)
- HARRY ALBERT PRESSEY, B.S.  
A Design for a System of Water Works for Warren, Mass. (*With H. D. Newell.*)
- JOHN LUTHER PUTNAM,  
An Investigation of Wave-Forms of Three-Phase Dynamo and Induction Motor. (*With J. W. Stickney.*)

- HARRY DUSTAN RAWSON,  
A City Bank.
- JAMES WALLACE RAYNOLDS,  
The Treatment of a Low-Grade Gold Ore from New Mexico by  
the Cyanide Process.
- DANIEL ANTEMAS RICHARDSON,  
Coefficients of Discharge for Narrow Weirs. (*With L. H. Tappan.*)
- EDWIN HUGHES ROBERTS,  
A design of a Mine Winding Machine.
- JOHN ARNOLD ROCKWELL, JR.  
A Bacterial Examination of the Air of Some Streets and Public  
Buildings in Boston.
- WILLIAM LACY ROOT,  
The Determination of Methane, Carbonic Oxide, and Hydrogen by  
Explosion.
- ALBERT FELIX RUCKGABER,  
Investigations upon a Brush Arc Dynamo. (*With L. K. Sager.*)
- ANDREW LEBARON RUSSELL,  
The Causes Affecting the Proportion of Sexes at Birth in France.
- NORMAN FRANKLIN RUTHERFORD,  
Some Effects of Inductance and Capacity in Alternating Current  
Circuits.
- LAWRENCE KINGSLEY SAGER,  
Investigations upon a Brush Arc Dynamo. (*With A. F. Ruck-  
gaber.*)
- NATHAN HERBERT SANDERSON,  
Experiments on Loss of Head in Pipes Due to Sudden Enlarge-  
ment. (*With S. F. Thomson.*)
- MORITZ SAX,  
A Post Office and Custom House for a Small Town.
- FREDERICK FRANCIS SCHALLER,  
Characteristics of Transformers.
- DONALD CLEVELAND SCOFIELD,  
A Hunting Lodge.
- JOHN COMBS SCOVEL, JR.  
The Comparative Strength of Various Knots in Manila Rope.

- HENRY KENT SEARS,  
The History of Suffrage in the United States since 1789.
- MORTIMER ANDREWS SEARS,  
The Concentration of an Argentiferous Galena Blende Ore from Colorado.
- GEORGE FREDERICK SHEPARD, JR.  
A Golf and Country Club.
- FRANK NEWELL SMALLEY,  
Halogen Addition Products of Trimethylamine.
- SAMUEL TUPPER SMETTERS, PH.B.  
A Plan for the Further Development of the Water Power of the Connecticut River at Turner's Falls, Mass. (*With A. C. Lutz.*)
- FRED HASKELL SMITH,  
A Study of Flue Gases. (*With E. C. Atkins.*)
- HERBERT EDWARDS SMITH,  
A Public Bath for the City of Boston.
- HOWARD EVERETT SMITH.  
A Design for a System of Sewerage and Sewage Disposal for the Town of Norwood, Mass. (*With F. E. Field.*)
- ALBERT ERNEST SMYSER,  
An Experimental Investigation of the Stress in Cast-Iron Pulley Arms and Rims. (*With J. E. Woodwell.*)
- FREDERICK WILLIAM SMYSER,  
An Investigation of the Effect of Friction in a 32-inch Fly-Wheel Governor. (*With J. S. Smyser.*)
- JAMES SWETT SMYSER,  
An Investigation of the Effect of Friction in a 32-inch Fly-Wheel Governor. (*With F. W. Smyser.*)
- WALTER MULLIKEN STEARNS,  
An Efficiency Test of the Electric Plant of the Waltham Gas and Electric Light Co. (*With E. A. Baldwin.*)
- HAROLD CONVERSE STEVENS,  
Experiments on Piezometer Connections.
- JOSEPH WHITE STICKNEY,  
An Investigation of Wave-Forms of Three-Phase Dynamo and Induction Motor. (*With J. L. Putnam.*)
- CHARLES HENRY HOWARD STONE,  
Preparation of Octomethylene Diethyl Ether.

- ESTHER STONE,  
Academic Hall and Gymnasium for Radcliffe College.
- BRADLEY STOUGHTON, Ph.B.  
The Smelting of a Sulphide Copper Ore from Western Massachusetts.
- MEYER JOSEPH STURM,  
A City Residence for an Architect.
- GEORGE WILLIAM SUMNER,  
A Study of a Method for Obtaining the Wave-Form of an Electric Current. (*With C. E. Batchelder.*)
- HARRISON SOUTHWICK TAFT, B.P.  
An Investigation into the Relation between the Deflection of Steel Columns and the Load Which They Carry.
- LEWIS HOOPER TAPPAN,  
Coefficients of Discharge for Narrow Weirs. (*With D. A. Richardson.*)
- WILLIAM BELLAMY TAYLOR,  
The Tensile Strength of Timber across the Grain.
- FRANK ARTHUR THANISCH,  
The Roasting and Amalgamation of an Argentiferous Zinc Blende from Bolivia, S. A.
- ALBERT WILLIAM THOMPSON,  
An Investigation of Certain Properties of Wooden-Rimmed Fly-Wheels. (*With C. H. Young.*)
- LUCY DOOLITTLE THOMSON, A.B.  
A Students' Hall for Smith College.
- SAMUEL FORSYTHE THOMSON,  
Experiments on Loss of Head in Pipes Due to Sudden Enlargement. (*With N. H. Sanderson.*)
- JOHN TILLEY,  
A Study of Alternating Current Arcs by the Stroboscopic Method.
- HENRY HARRIS TOZIER,  
The Synthesis of Phenylpropyl Ethyl Ether.
- CHARLES ELIPHALET TROUT,  
A Plan for the Abolition of a Grade Crossing at Roslindale, Mass.
- CHARLES WILLIAM TUCKER,  
An Investigation of the Acetylene Prepared from Copper Acetylide.

- ARTHUR PERLEY UNDERHILL,  
 Test of Quarter-Phase Transmission Plant of Simonds Manufacturing Co., Fitchburg, Mass. (*With C. E. Lawrence.*)
- GRACE ABBIE VAN EVEREN,  
 The Synthesis of Hexamethylene Diethyl Ether from Trimethylene Glycol.
- HERMANN VALENTIN VON HOLST, A.B.  
 A Hospital and Medical School.
- WILLIAM GUY WALL,  
 Tests of the Efficiency of Commercial Incandescent Lamps. (*With C. Morris, Jr.*)
- ROBERT SYDNEY WASON,  
 The Velocity of the Reaction Between Ferrous Chloride and Potassium Chlorate in the Presence of Hydrochloric Acid.
- HENRY ARTHUR WATERMAN,  
 A Test of a Sewerage Pumping Plant. (*With J. F. Brooks.*)
- JACOB LLOYD WAYNE,  
 The Effects of Variation of Temperature on Insulation Resistance. (*With W. M. Andrew.*)
- ALBERT JAMESON WELLS,  
 An Investigation of Wind Pressure upon Surfaces.
- CHARLES AUSTIN WENTWORTH,  
 A Design for a Jackknife Drawbridge for a Double-Track Railroad.
- LAMBERT NUTT WHITNEY,  
 An Investigation of Certain Alternating Current Phenomena. (*With W. O. Pennell.*)
- WILLIAM HENRY WHITTEN, JR.  
 An Experimental Study of Sulphide Electrodes.
- JOHN HOWARD WILLIS, A.B.  
 An Astronomical Observatory for a Large University.
- WILLETT AUBREY WOOD,  
 Tests of Blowers. (*With F. B. Owen.*)
- JULIAN ERNEST WOODWELL,  
 Experimental Investigation of the Stress in Cast-Iron Pulley Arms and Rims. (*With A. E. Smyser.*)
- CONRAD HENRY YOUNG,  
 An Investigation of Certain Properties of Wooden-Rimmed Fly-Wheels. (*With A. W. Thompson.*)

## Alphabetical Index.

PAGE	PAGE		
Administrative Officers . . . . .	15	Courses, Graduate . . . . .	26, 54, 84
Admission, Requirements for . . . . .	59	Courses of Instruction . . . . .	24
Admission to Advanced Standing, Re- quirements for . . . . .	60, 68	Courses, Schedules of . . . . .	27
Admission to Lowell School of Design, Requirements for . . . . .	196	Cummings Laboratory of Mining Engi- neering and Metallurgy . . . . .	97
Advanced Courses . . . . .	54, 85	Damage to Apparatus . . . . .	148
Age of Applicants for Admission . . . . .	60, 68	Dates of Examinations . . . . .	147
Algebra, Requirements in, for Admission	60, 61	Degrees, Advanced . . . . .	54, 85
Alumni, Associations of . . . . .	199	Degrees, Requirements for . . . . .	54, 70
Applied Mechanics, Instruction in . . . . .	80, 121	Deposit, Requirements in regard to . . . . .	148
Architects, Boston Society of . . . . .	102	Descriptive Geometry, Instruction in . . . . .	72, 121
Architectural Library . . . . .	102	Design, Lowell School of . . . . .	8, 195
Architectural Museum . . . . .	101	Dismissal, Honorable . . . . .	70
Architecture, Instruction in . . . . .	34, 101, 141	Divided Examinations . . . . .	65
Arithmetic, Requirements in, for Admis- sion . . . . .	62	Drawing, Instruction in . . . . .	72, 121
Arts, Society of . . . . .	8	Drill, Instruction in . . . . .	114
Attendance Card . . . . .	148	Economics, Instruction in . . . . .	112, 126
Attendance, Requirements in regard to, 146, 152		Electrical Engineering, Instruction in, 38, 80, 132	
Bachelor of Science, Degree of . . . . .	24, 70	Engineering Laboratories . . . . .	93
Biological Laboratory . . . . .	105	English, Instruction in . . . . .	44, 110, 123
Biology, Instruction in . . . . .	40, 103, 144	English Language and Literature, Re- quirements in, for Admission . . . . .	63
Board, Cost of . . . . .	152	Entrance, Requirements for . . . . .	59
Bond, Requirements in regard to . . . . .	148	Equipment . . . . .	10
Books, etc., Cost of . . . . .	152	Evening Courses . . . . .	192
Breakage, Rules in regard to . . . . .	149, 152	Examinations for Admission . . . . .	59
Buildings, Description of . . . . .	9	Examinations for Admission, Divided . . . . .	65
Calendar . . . . .	2, 147	Examinations for Admission in other Cities . . . . .	59
Certificates from Teachers . . . . .	66	Examinations for Conditioned Students . . . . .	147
Charter . . . . .	8	Examinations for Graduation . . . . .	70, 147
Chemical Engineering, Instruction in . . . . .	46, 92	Examinations for Lowell School of De- sign . . . . .	195
Chemical Laboratories . . . . .	76	Examinations, Intermediate . . . . .	147
Chemistry, Instruction in . . . . .	36, 74, 127	Examinations, Nature of . . . . .	71
Chemistry, Special Students in . . . . .	69, 77	Examinations, Semi-annual . . . . .	147
Civil Engineering, Instruction in . . . . .	28, 82, 134	Excursions . . . . .	75, 83, 93, 100, 106, 109
College Graduates, Admission of . . . . .	60	Expenses . . . . .	148, 153
Committees of the Corporation . . . . .	12	Faculty, List of Members . . . . .	23
"Conditions" at Examinations . . . . .	147	Fees . . . . .	85, 148
Conduct . . . . .	152	Fees for Entrance Examinations . . . . .	59
Corporation, Committees of . . . . .	12	Fellowships . . . . .	152
Corporation, Members of . . . . .	11		
Courses, Choice of . . . . .	25, 148		
Courses, Five-Year . . . . .	26, 54		



306 MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

PAGE	PAGE		
Fine Arts, Museum of . . . . .	74, 102	Mathematics, Instruction in . . . . .	71, 118
First-Year Courses . . . . .	27	Mechanical Engineering, Instruction in,	30, 85, 136
Five-Year Regular Courses . . . . .	26, 54	Mechanics, Theoretical and Applied, In-	79, 120
Foundation . . . . .	7	struction in . . . . .	96
Free Courses of Instruction . . . . .	192	Metallurgical Laboratory . . . . .	96
French, Instruction in . . . . .	109, 124	Metallurgy, Instruction in . . . . .	32, 97, 139
French, Requirements in, for Admission . .	62	Methods of Instruction . . . . .	71
General Studies, Instruction in . . . . .	44, 111, 123	Metric System, Preparation in . . . . .	66
Geodesy, Instruction in . . . . .	28, 84	Military Science and Tactics, Instruction	115
Geography, Physical, Instruction in . . . . .	106, 142	in . . . . .	105, 142
Geology, Instruction in . . . . .	50, 106, 143	Mineralogy, Instruction in . . . . .	32, 97, 139
Geometry, Requirements in, for Admis-	61, 62	Mining Engineering, Instruction in,	97
sion . . . . .	109, 124	Mining Laboratory . . . . .	110, 125
German, Instruction in . . . . .	63	Modern Languages, Instruction in . . . . .	74, 102
German, Requirements in, for Admission . .	26, 54, 84	Museum of Fine Arts . . . . .	40, 104, 107
Graduate Courses . . . . .	151	Natural History, Boston Society of	102, 142
Graduate Scholarships . . . . .	278	Natural Sciences, Instruction in . . . . .	52, 87, 138
Graduates, Alphabetical List of . . . . .	69	Naval Architecture, Instruction in . . . . .	78
Graduates of Colleges, Privileges granted	201	Nichols, William Ripley, Library . . . . .	15
to . . . . .	71	Officers, Administrative . . . . .	15
Graduates, Register of . . . . .	10, 115	Officers of Instruction . . . . .	25
Graduation, Requirements for . . . . .	115	Options . . . . .	149
Gymnasium . . . . .	7	Payments . . . . .	106, 142
Gymnastics, Instruction in . . . . .	44, 112, 126	Physical Geography, Instruction in . . . . .	42, 77, 130
Historical Sketch . . . . .	65	Physics, Instruction in . . . . .	79
History, Instruction in . . . . .	147	Physics, Library of . . . . .	78
History, Requirements in, for Admission,	153	Physics, Rogers Laboratory of . . . . .	44, 111, 125
Holidays . . . . .	135	Political Science, Instruction in . . . . .	59
Hours of Attendance . . . . .	153	Preparation for the Institute . . . . .	8
Hydraulic Engineering, Instruction in, 28, 83,	155	Proceedings of Society of Arts . . . . .	cover
Instruction, Officers of . . . . .	15	Publications, List of . . . . .	8
Instruction, Subjects and Methods of . . .	72	Quarterly, Technology . . . . .	28, 81, 133
Italian, Instruction in . . . . .	111, 125	Railroad Engineering, Instruction in,	201
Kidder Laboratories of Chemistry . . . . .	77	Register of Graduates . . . . .	154, 197
Laboratories . . . . .	77, 79, 81, 91, 93, 98, 106	Register of Students . . . . .	27
Language, Instruction in . . . . .	110, 125	Regular Courses . . . . .	146
Latin, Preparation in . . . . .	67	Regular Students, becoming Special . . . . .	146
Lectures for the Current Year . . . . .	22	Regulations . . . . .	152
Lectures, Occasional . . . . .	76, 84, 88, 91	Residence . . . . .	78
Libraries, Private . . . . .	80, 116	Rogers Laboratory of Physics . . . . .	7
Library, Architectural . . . . .	103	Rogers, President William B. . . . .	152
Library, Biological . . . . .	106	Rooms, Cost of . . . . .	48, 82, 134
Library, Boston Public . . . . .	116	Sanitary Engineering, Instruction in,	27
Library, Engineering . . . . .	98	Schedule of Courses . . . . .	116
Library, General . . . . .	116	Schedule of Topics . . . . .	149
Library, Mining . . . . .	101	Scholarships . . . . .	151
Library of American Statistical Associa-	114	Scholarships, Graduate . . . . .	150
tion . . . . .	106, 116	Scholarships, State of Massachusetts . . . . .	10, 96
Library of Boston Society of Natural	80	Shops, Description of . . . . .	96, 122
History . . . . .	78	Shopwork . . . . .	8
Library, Physical . . . . .	111, 124	Society of Arts . . . . .	109, 124
Library, Wm. Ripley Nichols Chemical . . .	63	Spanish, Instruction in . . . . .	56, 68, 116
Literature and Language, Instruction in,	193	Special Courses, Requirements for Admis-	
Literature, Requirements in, for Admission,	8, 196	sion . . . . .	
Lowell Free Courses of Instruction . . . . .			
Lowell School of Practical Design . . . . .			

ALPHABETICAL INDEX.

307

	PAGE		PAGE
Special Students . . . . .	55, 66	Uniforms for Drill . . . . .	114
Special Students, becoming Regular . . . . .	147	Vacation . . . . .	146
Status of Students, Determination of . . . . .	146	Visiting Committees . . . . .	13
Students, Lowell School of Design, Register of . . . . .	297	Women, Admission of . . . . .	60
Students, Register of . . . . .	154	Workshops . . . . .	10, 96
Subjects and Methods of Instruction . . . . .	71	Year, School . . . . .	146
Summer Courses . . . . .	28, 57, 84, 100, 102, 109	Zoölogy, Instruction in . . . . .	103, 144
Teachers, Facilities offered to . . . . .	40, 50, 55, 70		
Technology Quarterly . . . . .	8		
Theses . . . . .	70, 291		
Topics, Schedule of . . . . .	116		
Tuition Fees . . . . .	148		

