SWARTHMORE COLLEGE,

1886-87.

1886	1st Day.	2d Day.	3d Day.	4th Day.	5th Day.	6th Day.	7th Day.
	.	.	.	.	1	2	3
Seventh	4	5	6	7	8	9	10
Month.	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	31
	.	.	.	.	.	.	.
	1	2	3	4	5	6	7
Eighth	8	9	10	11	12	13	14
Month.	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31	.	.	.	.
	.	.	.	1	2	3	4
Ninth	5	6	7	8	9	10	11
Month.	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	.	.
	.	.	.	.	.	1	2
	3	4	5	6	7	8	9
Tenth	10	11	12	13	14	15	16
Month.	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	31	.	.	.	.	.	.
	.	1	2	3	4	5	6
Eleventh	7	8	9	10	11	12	13
Month.	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	.	.	.	.
	.	.	.	1	2	3	4
Twelfth	5	6	7	8	9	10	11
Month.	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	31	.

1887	1st Day.	2d Day.	3d Day.	4th Day.	5th Day.	6th Day.	7th Day.
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	2	3	4	5	6	7	8
First	9	10	11	12	13	14	15
Month.	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30	31	.	.	.	.	.
	.	.	1	2	3	4	5
Second	6	7	8	9	10	11	12
Month.	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	.	.	.	.	.
	.	.	1	2	3	4	5
Third	6	7	8	9	10	11	12
Month.	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	31	.	.
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	3	4	5	6	7	8	9
Fourth	10	11	12	13	14	15	16
Month.	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
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	1	2	3	4	5	6	7
Fifth	8	9	10	11	12	13	14
Month.	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31	.	.	.	.
	.	.	.	1	2	3	4
Sixth	5	6	7	8	9	10	11
Month.	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	.	.

1887	1st Day.	2d Day.	3d Day.	4th Day.	5th Day.	6th Day.	7th Day.
	.	.	.	.	.	1	2
Seventh	3	4	5	6	7	8	9
Month.	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	31	.	.	.	.	.	.
	.	1	2	3	4	5	6
Eighth	7	8	9	10	11	12	13
Month.	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	31	.	.	.
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Ninth	4	5	6	7	8	9	10
Month.	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	.
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	2	3	4	5	6	7	8
Tenth	9	10	11	12	13	14	15
Month.	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30	31	.	.	.	.	.
	.	.	1	2	3	4	5
Eleventh	6	7	8	9	10	11	12
Month.	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	.	.	.
	.	.	.	.	1	2	3
Twelfth	4	5	6	7	8	9	10
Month.	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	31

1888	1st Day.	2d Day.	3d Day.	4th Day.	5th Day.	6th Day.	7th Day.
	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
First	15	16	17	18	19	20	21
Month.	22	23	24	25	26	27	28
	29	30	31	.	.	.	.
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	5	6	7	8	9	10	11
Second	12	13	14	15	16	17	18
Month.	19	20	21	22	23	24	25
	26	27	28	29	.	.	.
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	4	5	6	7	8	9	10
Third	11	12	13	14	15	16	17
Month.	18	19	20	21	22	23	24
	25	26	27	28	29	30	31
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	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
Fourth	15	16	17	18	19	20	21
Month.	22	23	24	25	26	27	28
	29	30	.	.	.	.	.
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	6	7	8	9	10	11	12
Fifth	13	14	15	16	17	18	19
Month.	20	21	22	23	24	25	26
	27	28	29	30	31	.	.
	.	.	.	.	.	1	2
	3	4	5	6	7	8	9
Sixth	10	11	12	13	14	15	16
Month.	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	.	.	.	.	.	.	.

SWARTHMORE COLLEGE.

EIGHTEENTH

ANNUAL CATALOGUE

OF

SWARTHMORE COLLEGE,

SWARTHMORE, PA.

1886-87.

PRESS OF
FRIENDS' BOOK ASSOCIATION,
S. W. Cor. 15th and Race Streets, Philadelphia.

CONTENTS.

CALENDAR.

1886-87.

1886.	Ninth Month, 14th, Third-day . . .	Meeting of the Board of Managers.
"	Ninth Month, 15th, Fourth-day . .	Examinations for Admission begin.
"	Ninth Month, 16th, Fifth-day . . .	Examinations for Admission completed, and old students return.
"	Ninth Month, 17th, Sixth-day . . .	Regular Exercises begin.
"	Twelfth Month, 6th, Second-day . .	Meeting of the Board of Managers.
"	Twelfth Month, 7th, Third-day . .	*Annual Meeting of Stockholders.*
"	Twelfth Month, 7th, Third-day . .	Meeting of the Board of Managers.
"	Twelfth Month, 23d, Fourth-day, P.M.	Holidays begin.
1887.	First Month, 3d, Second-day	Students return for roll-call at 8 P.M.
"	First Month, 4th, Third-day	Regular Exercises begin.
"	Third Month, 1st, Third-day	Candidates for degrees present Theses.
"	Third Month, 8th, Third-day . . .	Meeting of the Board of Managers.
"	Fourth Month, 6th, Fourth-day . .	Spring Recess begins.
"	Fourth Month, 13th, Fourth-day . .	Students return for roll-call at 8 P.M.
"	Fifth Month, 30th, Second-day . . .	Senior Examinations begin.
"	Sixth Month, 6th, Second-day . . .	Senior Examinations completed, the results announced, and parts for Commencement assigned.
"	Sixth Month, 13th, Second-day . . .	Final Examinations begin.
"	Sixth Month, 17th, Sixth-day . .)	
"	Sixth Month, 18th, Seventh-day .)	Examinations for Admission.
"	Sixth Month, 20th, Second-day . . .	Class Day Exercises.
"	Sixth Month, 20th, Second-day . . .	Meeting of the Board of Managers.
"	Sixth Month, 20th, Second-day . . .	Annual Business Meeting of the Alumni Association.
"	Sixth Month, 21st, Third-day . . .	*Commencement.*
"	Ninth Month, 13th, Third-day . . .	Meeting of the Board of Managers.
"	Ninth Month, 14th, Fourth-day . .	Examinations for Admission begin.
"	Ninth Month, 15th, Fifth-day . . .	Examinations for Admission completed, and old students return.
"	Ninth Month, 16th, Sixth-day . . .	Regular Exercises begin.
"	Twelfth Month, 5th, Second-day . .	Meeting of the Board of Managers.
"	Twelfth Month, 6th, Third-day . .	*Annual Meeting of Stockholders.*
"	Twelfth Month, 6th, Third-day . .	Meeting of the Board of Managers.
"	Twelfth Month, 23d, Sixth-day . . .	Holidays begin.
1888.	First Month, 2d, Second-day	Students return for roll-call at 8 P.M.
"	First Month, 3d, Third-day	Regular Exercises begin.

CORPORATION.

OFFICERS.

CLERKS.

GEORGE W. HANCOCK . . . . . 40*th St. and Lancaster Ave., Phila.*
FANNIE A. WILLETS . . . . . *Trenton, N. J.*

TREASURER.

ROBERT BIDDLE . . . . . 511 *Commerce Street, Philadelphia.*

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Term expires Twelfth Month, 1887.

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JOSEPH WHARTON . . . . . *P. O. Box* 1332, *Philadelphia.*
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Term expires Twelfth Month, 1888.

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Term expires Twelfth Month, 1890.

ISAAC H. CLOTHIER . . . . . 8*th and Market Streets, Phila.*
JAMES V. WATSON . . . . . 718 *Franklin Street, Philadelphia.*
HERMAN HOOPES . . . . . 609 *Chestnut Street, Philadelphia.*
MARTHA G. McILVAIN . . . . . 59*th St. and Elmwood Ave., Phila.*
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EDMUND WEBSTER . . . . . 1156 *South Broad Street, Phila.*
EMMA McILVAIN . . . . . 59*th St. and Elmwood Ave., Phila.*
REBECCA C. LONGSTRETH . . . . . *Sharon Hill, Delaware County, Pa.*

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JOSEPH WHARTON.

SECRETARY.

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ANNA M. FERRIS,
HERMAN HOOPES,
CLEMENT M. BIDDLE,
M. FISHER LONGSTRETH,
LYDIA H. HALL,
ANNA M. HUNT,
MARY WILLETS,
HELEN COMLY WHITE.

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SUSAN W. LIPPINCOTT,
EDMUND WEBSTER,
GEORGE W. HANCOCK.

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EDWARD STABLER, JR.,
ELI M. LAMB,
ISAAC H. CLOTHIER,
LYDIA H. HALL,
SARAH H. POWELL,
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EMMOR ROBERTS, JAMES V. WATSON,
EDWARD H. OGDEN.

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EDWARD H. OGDEN,
EMMOR ROBERTS,
JAMES V. WATSON,
DANIEL UNDERHILL,
GEORGE W. HANCOCK,
EDMUND WEBSTER.

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JOSEPH WHARTON,
DANIEL UNDERHILL,
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JOHN T. WILLETS.
M. FISHER LONGSTRETH, *Secretary and Treasurer of Committee.*

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HERMAN HOOPES,
CLEMENT M. BIDDLE,
ELI M. LAMB,
MARTHA G. McILVAIN,
JANE P. DOWNING,
ANNA M. HUNT,
SUSAN W. LIPPINCOTT,
EMMA McILVAIN,
HANNAH H. WOODNUTT,
MARY WILLETS,
ELIZABETH B. PASSMORE.
Ex-Officio, M. FISHER LONGSTRETH.

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EDWARD H. MAGILL, President.

ELIZABETH POWELL BOND, Matron.

Prof. EUGÈNE PAULIN.

Prof. ARTHUR BEARDSLEY.

Prof. WILLIAM HYDE APPLETON.

Prof. SUSAN J. CUNNINGHAM.

Prof. SAMUEL S. GREEN.

Prof. HENRY W. ROLFE.

Prof. WILLIAM PENN HOLCOMB.

Prof. BENJAMIN SMITH.

Asst. Prof. FERRIS W. PRICE.

WILLIAM J. HALL, Superintendent.

* By-Law IX.—"The President, Matron, and such of the resident Professors and others as may be elected by the Board, shall constitute the Faculty. They shall hold regular meetings, arrange the course of study, determine the qualifications for admission and for graduation, decide upon rules of order, and determine all questions pertaining to the discipline or instruction, subject to the approval of the Executive Committee, to whom they shall report monthly."

OFFICERS OF INSTRUCTION.*

EDWARD H. MAGILL, LL.D.,
President.

JOSEPH LEIDY, M.D., LL.D.,
Emeritus Professor of Natural History, and Curator of the Museum.

EUGÈNE PAULIN, A.M.,
Professor of French, Spanish, and Philosophy.

ARTHUR BEARDSLEY, C.E.,
Professor of Civil and Mechanical Engineering, and Librarian.

WILLIAM HYDE APPLETON, A.M.,
Professor of Greek and German.

SUSAN J. CUNNINGHAM,
Professor of Mathematics and Astronomy.

JOSEPH THOMAS, M.D., LL.D.,
Professor of English.

SAMUEL S. GREEN, M.S.,
Professor of Physics.

HENRY W. ROLFE, A.M.,
Professor of Latin.

WILLIAM PENN HOLCOMB, Ph.D.,
Professor of History and Political Science, and Lecturer on Pedagogics.

* Arranged, with the exception of the President, in the order of appointment, by classes: Professors, Assistant Professors, and Instructors.

BENJAMIN SMITH, A.M.,
Professor of Rhetoric and English.

CHARLES S. DOLLEY, M.D.,
Professor of Natural History, and Lecturer on Physiology and Hygiene to the young men.

ALBERT R. LAWTON, A.M.,
Assistant Professor of German and French.

SUSAN WOOLSTON GILLAM,
Assistant Professor in charge of Elocution.

FERRIS W. PRICE, A.B.,
Assistant Professor of Latin.

ALBERT G. PALMER, Ph.D.,
Assistant Professor in charge of Chemistry.

BEATRICE MAGILL (Graduate of School of Design, Philadelphia; and Student of Pennsylvania Academy of Fine Arts),
Instructor in Free-Hand Drawing and Painting.

SUSAN P. STACKHOUSE, M.D.,
Lecturer on Physiology and Hygiene to the young women.

OLIVIA RODHAM,
Assistant Librarian, and Instructor in Botany.

EDGAR L. BROTHER (Graduate of Manual Training School, Washington University),
Instructor in Forging, Vise-work, and Machine Tools.

MILTON H. BANCROFT (Graduate of Massachusetts Normal Art School),
Instructor in Geometrical and Mechanical Drawing.

MARY J. MURPHY,
Director of Physical Culture for the young women.

Director of Physical Culture for the young men.

GENERAL INFORMATION.

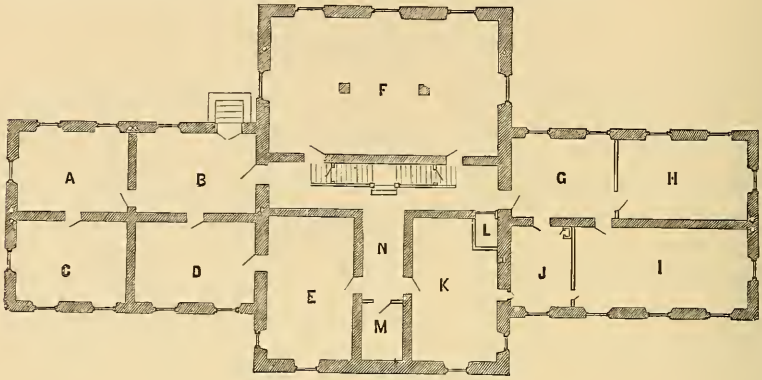
BUILDINGS AND GROUNDS.

Swarthmore College was founded by members of the religious Society of Friends, in order to provide the children of the Society and others with opportunities for higher education under guarded care. With this object in view, a property of two hundred and forty acres was secured in a rural district ten miles from Philadelphia, on the Central Division of the Philadelphia, Wilmington, and Baltimore Railroad. It is accessible by trains, from the Broad Street Station, sixteen times daily. About half the land is used for farming purposes, providing milk and vegetables for the College; the remainder is devoted to lawn and pleasure grounds. Crum Creek, which forms the western boundary of the property, affords facilities for boating, bathing, and skating. The portion of the grounds bordering the stream is of great picturesque beauty. The building site is high, thus securing perfect drainage and pure air, and commanding a fine view of the surrounding country for many miles.

The Principal College Building is a massive stone structure 348 feet long. It consists of a central building four stories high, containing public rooms such as Lecture-rooms, Museum, Library, Reading Room, Parlors, Dining Hall, etc. Fire-proof compartments separate this building from the two wings. The latter are each three stories high. The ground floors are devoted to lecture and recitation rooms; the remaining floors in the East Wing contain the dormitories of the young women, and in the West Wing, those of the young men. The sexes mingle freely under proper care in the class-rooms, parlors, and dining hall. The instructors reside in the same building with the students, and the relations between them are such that there is comparative freedom from the dangers and temptations ordinarily incident to college life. The buildings are heated throughout by steam, lighted by gas, and thoroughly ventilated.

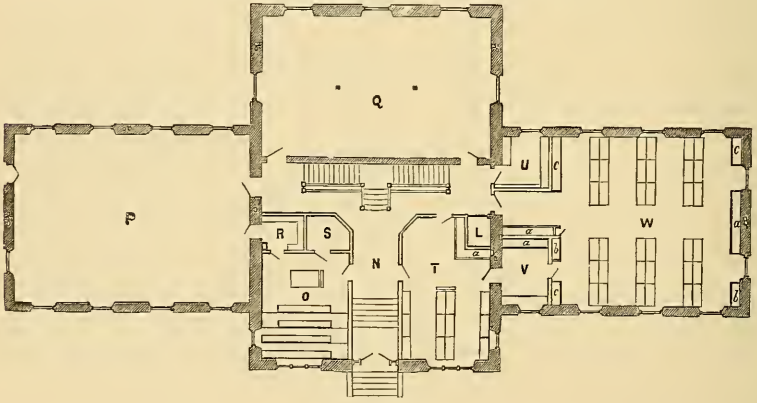
The Science Hall is constructed of stone, in the most durable manner, and was planned with special reference to the work of students in Engineering, Physics, and Chemistry. The centre building has a frontage of 44 feet, and a depth of 64 feet; the wings are each 43 x 33 feet.

The following floor-plans will explain the arrangement of the several floors, and the uses to which they are applied:



BASEMENT.

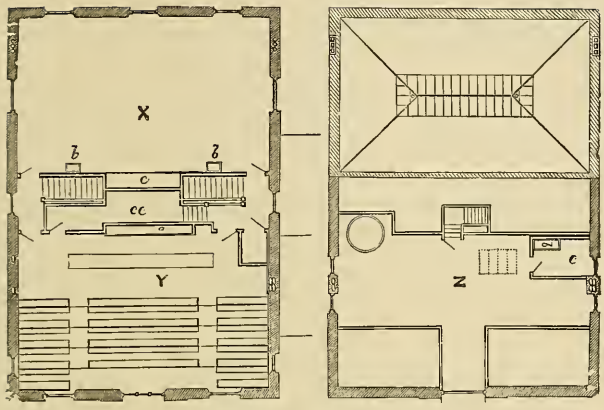
A and B, Blacksmith-shop, containing complete sets of blacksmiths' tools; forges, anvils, vises, etc. C and D, Wood-working and pattern-making; containing lathes, benches, etc. F. Brass Foundery, with its crucible furnace, oven for baking cores, founders' benches, etc. G, Unpacking room of the chemical department. H, I, J, Store-rooms. K, Metallurgical Laboratory, which contains also the gasometers for supplying the laboratories and lecture-room with oxygen and hydrogen gases.



FIRST FLOOR.

O, Engineering, Lecture-, and Recitation-room. P, Mechanical Laboratory and Machine-shop, containing all the tools and appliances generally found in first-class machine-shops. Power is obtained by an engine driven by steam either from the main college boilers or from the shop boiler, at pleasure.

Q, Physical Laboratory. R, Wardrobe. S, Engineering Field Instruments, etc. T, Quantitative Laboratory, with all necessary appliances. U, Balance-room and Chemical Library. V, Private room of the Professor of Chemistry. W, Qualitative Laboratory.



SECOND FLOOR AND ATTIC

X, Drawing-room, lighted by a skylight and by large North windows. Y, Lecture-room, with large hood and lecture-table, supplied with oxygen and hydrogen. Z, Photographic room, with North skylight and dark room.

The Astronomical Observatory is especially arranged for purposes of instruction. The plan embraces a central building supporting the dome and two wings, of which only one is at present constructed. The equipment is ample for class-work; it will be found described in detail below under Laboratories and Apparatus.

Other Buildings are a Meeting-House, the President's House, the West House (birthplace of Benjamin West, now used as a Professor's residence), the Farmer's House and commodious farm buildings, the Laundry and Bakery, and the Boiler House, containing the sectional boilers for heating and cooking purposes. All these buildings are constructed of stone.

LABORATORIES AND APPARATUS.

The Astronomical Observatory contains three rooms: a *transit-room*, in which is placed an instrument of three inches aperture, also the mean-time clock, the chronograph and the barometer; a *pier-room*, which is at present utilized as a sidereal clock-room and work-room; and the *dome*, containing the equatorial of six inches aperture. In connection with this latter instrument there is a micrometer and a spectroscope. The transit and equatorial were constructed by Warner and Swasey, of Cleveland, and the spectroscope by Brashear, of Allegheny.

The Biological Laboratory is well lighted by windows on the north. It is heated by steam and supplied with all the appliances, microscopical and otherwise, needed for the work carried on. A conservatory and numerous small aquaria furnish a constant supply of material for study, both in the course in Biology and in advanced Botany.

The Chemical Laboratory occupies rooms in Science Hall. It includes a room for work in general Chemistry and Qualitative Analysis, one for Quantitative Analysis, and a basement room for Assaying and Metallurgy. Near to these are store-rooms, a balance-room, and a lecture-room. The Laboratory tables are covered with glazed tiles and fume-closets, suction for filtration; water and gas are provided. The Lecture-room, with a seating capacity of one hundred, is furnished with water, gas, fume-closets, and abundant apparatus for lecture purposes, including a nearly complete set of the apparatus devised by Dr. Hofmann, of Berlin. For lecture illustration there is an excellent collection of the metals and their salts, and a cabinet of minerals (deposited by Hugh Foulke); in addition to these, there has recently arrived from C. F. Kahlbaum, of Berlin, a complete set of typical preparations for use in the course in Organic Chemistry.

The Draughting Rooms of the Engineering Department, in Science Hall, and the room for free drawing and painting, in the main building, are all lighted from the north. They are furnished with adjustable tables, models, etc., are well ventilated and warmed, and are open for work during the greater part of the day.

The Mechanical Laboratory includes several shops, in which the students become familiar with the nature and properties of the materials of construction (iron, wood, brass, etc.) employed by the engineer, and with the processes of working them into the desired forms for their intended uses. They consist of

The Machine-Shop, containing an Olsen's testing machine, arranged for tensile, compressive, and transverse tests, and an excellent and complete assortment of tools, including 4 screw-cutting engine-lathes, 3 speed-lathes (simple and back-geared), an iron planer, a complete universal milling machine, a set of milling cutters adapted for general purposes and for making other cutters, a shaper, a twist-drill grinder, 2 upright drills, an emery grinder, a mill grinder, a grindstone, 14 vises (plain and swivel), 14 lathe-chucks

(combination, independent, scroll, and drill), a milling machine chuck, a rotary planer chuck, planer centres, a set of Betts's standard gauges, surface plates (Brown & Sharpe), 3 sets of twist-drills, reamers, mandrels, screw-plates, taps and dies, lathe centre grinder, a complete set of steam-fitters' tools with pipe vise, ratchet drill, etc., together with the many necessary small tools, hammers, chisels, files, etc. Additions are constantly being made to this collection, as they are needed, either by manufacture in the shops or by purchase. Power is furnished by a steam-engine and boiler, the former fitted with an improved indicator, and the latter with the necessary attachments for determining its efficiency, etc.

The Wood-Working Shop, containing 20 benches with vises, and 20 sets of wood-working tools, a grindstone and wood-turning lathes.

The Smith-Shop, containing 7 forges, anvils, and sets of blacksmith tools, bench, and vise; and

The Foundery, with its brass furnace and other equipments.

The Physical Laboratory is provided with apparatus for determinations in the mechanics of solids and fluids, in heat, sound, light, electricity, and magnetism; and also with a large amount of fine apparatus for lecture experiments, which has been selected with care from the best American and foreign makers. Power for running dynamos and for other purposes can be furnished from the college shops near at hand. They also afford facilities for the prompt repair and construction of apparatus.

LIBRARIES AND READING ROOM.

The Libraries of the College collectively contain 11,945 volumes, as follows:

The General Library	8494
Literary Societies' Libraries	2560
Friends' Historical Library	891

Members of the senior class are permitted, under proper regulations, to consult the Philadelphia Library, containing 145,000 volumes, and the Mercantile Library, containing 150,000 volumes. The general Library is at all times accessible to the College students, and at stated times to the pupils of the Preparatory School.

The Assistant Librarian will aid students in consulting the library and in arranging courses of reading.

Friends' Historical Library, founded by the late Anson Lapham, of Skaneateles, N. Y., consists of Friends' books, photographs of representative Friends, and manuscripts relating to the Society and its history, and is, upon application to the Librarian, accessible to teachers, students, and members of the household.

This collection is stored in a fire-proof apartment, and it is hoped that Friends and others will deem it a secure place to deposit books and other material in their possession which may be of interest in connection with the history of the Society. Such contributions should be sent to the Librarian, *Arthur Beardsley, Swarthmore, Pa.*

The Reading Room, supplied with the leading literary and scientific journals, and the prominent newspapers of the principal cities, is open to students at all times except during regular hours for study and recitations.

Literary Societies are maintained by the students. There are two for young men, and one for young women. These hold regular meetings for the reading of essays, etc., and for practice in debates. Their Libraries, under their own management, contain over two thousand volumes, and are accessible to all of the College students.

A Scientific Society is also maintained by the students interested in science.

THE MUSEUM.

The Museum of the College is strictly a teaching collection, and the specimens from its cases are in constant use in the lectures and laboratories in Natural History; it is growing steadily, but always in the direction of rendering more perfect the means of illustrating the different departments of natural history, and with no intention of making it a collection of curiosities or miscellaneous articles, however interesting they may be in their way.

It includes the following collections:

1. The **Joseph Leidy Collection of Minerals,** the result of thirty years of discriminative collecting by its founder, occupies four large double cases, and consists of exceedingly choice cabinet specimens of crystallized minerals, characteristic rocks and ores,

and transparent and opaque models of the various systems of crystallization.

2. The **Collection of Comparative Osteology** consists of a large series of partial and complete skeletons, prepared at Prof. Henry Ward's Natural History Establishment in Rochester, N. Y., and illustrating the structure of the framework of backboned animals.

3. The **Wilcox and Farnum Collection of Birds** comprises four large double cases of stuffed specimens of native and foreign birds. Nearly all the species visiting this State are represented.

4. The **Frederick Kohl Ethnological Collection** consists of two cases of Indian implements, weapons, clothing, etc., mostly from Alaska.

5. The **C. F. Parker Collection of Shells** is made up of six large cases of choice typical, land, fresh-water, and marine shells. These specimens were all selected by the Curator from the extensive collection of the late C. F. Parker, and render further additions to this branch needless. The founder of this collection was for many years the Curator in charge of the Academy of Natural Sciences of Philadelphia.

6. The **Robert R. Corson Collection of Stalactites, Stalagmites, and Helictites,** from the celebrated Luray Caverns, illustrating the limestone formations which render these caverns the second in magnificence in the world.

7. The **Eckfeldt Herbarium,** consisting of over two thousand plants, illustrates the flora of Pennsylvania.

In addition to the above, there is a large and constantly-increasing collection of stuffed and alcoholic specimens of vertebrates and invertebrates (including the U. S. Fish Commission Educational Collection) of dissected specimens for demonstration in the lectures on Physiology and Hygiene, glass and papier-maché models of invertebrates and of special points in vegetal and animal morphology, besides some three hundred classified diagrams and finely-colored charts illustrating every branch of natural history.

THE GYMNASIUM.

The Gymnasium is supplied with a full set of apparatus for exercising according to the system of Dr. Sargent. The exercises

are conducted in separate classes for the young men and young women, and are required of all.

Students are requested to bring from home a physician's certificate if there is any cause that would make it dangerous for them to take part in the exercises required.

A large room in the main building also is set apart for the exercises of the young women.

The extensive and beautiful grounds connected with the College invite to out-door exercise, which is encouraged by the authorities. On the highest and driest part of the campus a space has been prepared for athletic games, with a track for running, a quarter of a mile in length, extending around it.

GENERAL REGULATIONS.

Religious Exercises.—While care is taken to inculcate the doctrine that religion is a matter of practical daily life, and is not confined to the observance of set forms or the promulgation of religious tenets, the regular assembling for religious purposes is carefully observed. On First-day morning a religious meeting is held, attended by students, teachers, and members of the household, and occasionally by visiting Friends. The meeting is preceded by First-day school exercises, consisting of the recitation of passages of Scripture prepared by members of the different classes, and the reading of a portion of Scripture at the close. The daily exercises are opened by a general meeting for reading selected portions of Scripture, or other suitable books, and for imparting such moral lessons as circumstances seem to require, followed by a period of silence before entering upon the duties of the day.

Leave of Absence will not be granted without a *written* request from parents or guardians, which request should not be made oftener than once a month, and, in all cases, should be accompanied by reasons satisfactory to the Faculty.

Students may be visited, on week-days, by parents or guardians, or by near relatives, or others approved by parents or guardians; but general visiting is discouraged. *Students must not be interrupted in their studies or recitations at any time; nor must they be visited on the First-day of the week.*

All persons who are interested in education, and who are desirous of examining the methods of instruction and discipline at Swarthmore, will be welcomed at any time, and should, when convenient, communicate with the President upon the subject in advance.

Outfit.—Although no form of dress is prescribed for either sex, such simple attire as is appropriate to school-life is earnestly recommended. Ear-rings, bracelets, necklaces, and elaborately-trimmed dresses are prohibited.

Students should be supplied with six towels, six napkins, two clothes-bags, a wrapper, slippers, umbrella, and the requisite toilet articles. Each girl must be provided with a dress, suitable for practising in the Gymnasium. Every article must be marked with the full name of the owner.

The Use of Tobacco *being strictly prohibited, those addicted to its use, unless prepared to renounce it entirely, should not apply for admission.*

Commencement and Vacations.—The College year begins on the second Third-day of Ninth month, and closes with Commencement-day, which occurs on the third Third-day of Sixth month.

Students are not admitted for a period less than the current College year, but, when vacancies exist, may enter at any time during the year.

Besides the summer vacation, there will be a recess of ten days at the close of the Twelfth month, and one of a week in the Fourth month. (See Calendar.)

Students are permitted to remain at the College, under care, during the recesses, but not during the summer vacation.

The Household.—In the organization of this institution unusual care has been extended to the personal comfort and the social interests of the students. This department is in charge of the Matron, with able assistants. She has also special oversight of the conduct and health of the young women and girls, and parents are desired to communicate freely with her in regard to the welfare of their daughters.

PREPARATORY SCHOOLS.

Besides the College proper the institution embraces a Preparatory School. The pupils of this school receive instruction from

teachers employed especially for this purpose, and also from professors and instructors of the College.

This school receives those pupils who are not sufficiently advanced in their studies to enter the College. The point of advancement requisite for admission to the College will be found explained on page 23 of this catalogue.

Parents are requested to examine the requirements for admission and, whenever it is practicable, to have their sons and daughters prepared to enter the Freshman Class.

On page 24 will be found a list of schools which are authorized to recommend candidates for the Freshman Class without examination.

EXPENSES.

In the College the cost of Board and Tuition is $450 per year, of which $250 is payable in advance, and $200 on the first of First month.

In the Preparatory School the charges are $350 per year, of which $200 is payable in advance, and the rest on the first of First month.

A deduction of $100 per year is made from the above charges to all students who are children of members of the religious Society of Friends.

For Day Scholars the price is $200 per year in the College and $150 per year in the Preparatory School, of which $100 is payable in advance, and the remainder on the first of First month. A deduction of $50 per year is made from these charges to all students who are children of members of the religious Society of Friends. The day scholars dine with the resident students.

Books are Furnished for the use of all students without expense, but they buy their own stationery, drawing implements, and certain tools and materials used in the workshops. Students taking laboratory courses make a deposit of $10 at the beginning of the course, to cover the expense of the material used. The unexpended balance is returned at the end of the course.

In Case of Sickness, no extra charge is made unless a physician is employed.

Boys are allowed the washing of one dozen plain pieces weekly; and girls the washing of sixteen plain pieces weekly. Extra washing is paid for at fixed rates.

The price being made as low as experience shows to be compatible with prudence, while many of our expenses are annual in their character, and teachers

and other officers at fixed yearly salaries must be engaged in proportion to the number of students entered, we cannot, in case of withdrawal, return the full proportionate amount paid without loss. When the connection of a student with the institution shall terminate by sickness, or by any other cause approved by the Faculty, before the end of the period for which payment has been made, the student may have the privilege of sending an approved substitute for the unexpired term, or may apply, in writing, to the Treasurer, and a return will be made of two-thirds of the amount prepaid from the date of said application or written notice that the place is vacated.

The above prices may be depended upon as covering all necessary expenses, as there are no other extra charges.

PAYMENTS.

Payments are to be made by check or draft to the order of

ROBERT BIDDLE, Treasurer,

No. 511 Commerce Street, Philadelphia.

THE COLLEGE.

INTRODUCTORY.

The studies required for a degree extend over four years. The requirements for admission are intended to be such as Friends' schools generally can meet. Owing to the enforcement of regular hours for study and the absence of all opportunity for dissipation, the amount accomplished in four years is large, and is believed to afford a sufficient preparation in classics, science, and general culture for the ordinary avocations of life, for the study of any of the learned professions, or for the pursuit of special courses in the higher universities at home or abroad.

TIME AND CONDITIONS OF ADMISSIONS.

To secure places, application for admission should be made as early as possible by letter to the President.

All applicants must submit satisfactory testimonials of good character from their last teachers, and students coming from another college must present certificates of honorable dismission.

The examinations for admission may be taken either in the Summer at the close of the College year, or in the Fall. The times are as follows for the year 1887 :

SUMMER EXAMINATIONS.

Sixth-day,	Sixth	Month,	17th,	at	2 P.M.	. . Mathematics.
"	"	"	"	"	3.30 P.M.	. English.
Seventh-day,	"	"	18th	"	8.15 A.M.	. History.
"	"	"	"	"	9.15 A.M.	. Geography.
"	"	"	"	"	10.15 A.M.	. Latin, German or French.
"	"	"	"	"	2 P.M.	. . Greek.

Arrangement can be made for board at the College during the above examinations.

FALL EXAMINATIONS.

Candidates should present themselves at the College on the afternoon of Third-day, Ninth month, 13th, 1887.

The examinations will occur as follows:

Fourth-day,	Ninth	Month,	14th,	8.15	A.M.	. Mathematics.
"	"	"	"	9.15	A.M.	. English.
"	"	"	"	10.15	A.M.	. History and Geography.
"	"	"	"	2	P.M.	. Latin, German or French.
"	"	"	"	3	P.M.	. Greek.

REQUIREMENTS FOR ADMISSION.

Candidates for admission to the Freshman Class will be examined in the following subjects:

1. MATHEMATICS.—*Arithmetic.*—Fundamental Rules, Fractions (common and decimal), Denominate Numbers, Percentage and its applications, Proportion, and the Metric System.

Algebra.—Through Equations of the second degree of one unknown quantity.

Geometry.—The whole of Plane Geometry.

2. ENGLISH.—The candidate will be asked to write a few pages upon some assigned subject, or from dictation. This exercise will be examined with reference to Grammar, Spelling, Paragraphing, Punctuation, and the use of Capitals. An examination will also be given in the principles of the grammar.

3. HISTORY.—A general outline of the History of the United States and of England, with the principal dates; the principal facts and dates in Grecian History. In this connection there will be an examination in Ancient Geography, particularly that of Italy, Greece, and Asia Minor.

4. GEOGRAPHY.—The general facts of Physical Geography, Descriptive and Political Geography, especially of the United States and Europe.

In addition to the above, the candidate will be examined in one of the following subjects as he may elect:

5. LATIN.—Cæsar, Gallic War, four books; Virgil's Æneid, six books; Allen's Latin Composition; as much knowledge of Roman Antiquities as may be gained from Wilkins's Primer; as much knowledge of Classical Geography as may be gained from Tozer's Primer; and as much knowledge of Classical Mythology as may be gained from Cox's Manual of Mythology.

For the Cæsar other Latin may in certain cases be substituted, but only in accordance with previous agreement.

6. FRENCH.—The candidate should be familiar with the Grammar, especially with the formation and use of verbs. He should be able to read easy French at sight, and to translate simple English sentences into French. For this preparation, which should occupy two years, Magill's Grammar and Reader, and Magill's Prose and Poetry are recommended; or French Classics may be read.

7. GERMAN.—The preparation in German should occupy two years; the first year being devoted to the Grammar and Reader and to writing Exercises, and the second year to reading German Classics, with a review of the Grammar. The candidate should be able to read easy German at sight, and to translate simple English sentences into correct German.

Candidates who are prepared in both French and German may offer half the above amount, equivalent to one year's study of each.

Candidates for the *Classical Section* must pass the above examination in *Latin*.

Greek is not required for admission, but students who have been prepared in Greek may continue in that language with students in the higher College classes.

Candidates for the *Scientific Section*, who have had no opportunity to prepare in Latin, French, or German, will not be rejected on account of such deficiency, if they are otherwise qualified. An opportunity will be offered to make up the deficiency after admission.

Preparation in Free-Hand Drawing is recommended for all students.

The attention of Committees and Principals of Schools, preparing students for the College, is called to the course of study in the Swarthmore Preparatory School, which is deemed a suitable preparation.

For Advanced Standing.—Candidates will be further examined in the studies already pursued by the class for which they present themselves; but in the case of such students, real equivalents will be accepted for any of the studies gone over by the class.

ADMISSION WITHOUT EXAMINATION.

I. Those candidates for the Freshman Class prepared in the following schools will not be examined, but will be admitted on certificates signed by the Principals of the schools.*

Friends' Central School	Philadelphia, Pa.
Friends' Seminary	New York, N. Y.
Friends' High School	Baltimore, Md.
Woodstown Academy	Woodstown, N. J.
Friends' School	Wilmington, Del.
Friends' High School	West Chester, Pa.
Friends' High School	Moorestown, N. J.
Buckingham Friends' School	Lahaska, Pa.
Friends' Academy	Locust Valley, L. I.
Friends' Select School	Washington, D. C.
Sherwood School	Sandy Spring, Md.

* Other Friends' schools may on application be added to this list, if the Faculty and Instruction Committee shall be satisfied that they are taught by competent teachers, and are furnishing the requisite preparation for admission. This arrangement will hold good in each case so long as the results continue satisfactory.

Pupils from these schools, intending to enter the College, should apply by letter for places as soon as convenient after the completion of their preparation. They should present themselves at the College on the afternoon of Fifth-day, Ninth month, 15th, 1887.

Principals of other schools, who wish to have students admitted on their recommendation, should correspond with the President concerning each case.

II. A limited number of teachers and other persons of fair education and over twenty-one years of age, who may wish to improve themselves in particular studies, will be received without examination, and allowed to elect, in any of the regular classes, such work as they can pursue to advantage. They should in all cases correspond with the President in advance.

COURSES OF INSTRUCTION.

I.—MATHEMATICS.

1. Wells's Algebra, through Quadratic Equations; Davies's Legendre's Geometry, Review, and Book VI.; Chauvenet's Plane Trigonometry. Four times a week. *Required of all students in the Freshman Class.*

2. Davies's Legendre's Geometry, Books VII.–IX.; Wells's Higher Algebra. Twice a week. *Required of all students in the Sophomore Class.*

3. Todhunter's Conic Sections. Twice a week. *Required of Engineering students in the Sophomore Class, and elective for others in that class.*

4. Williamson's Differential and Integral Calculus; Chauvenet's Spherical Trigonometry. Four times a week. *Required of Engineering students in the Junior Class, and elective for others in that class who have completed Course 3.*

5. Chauvenet's Spherical and Practical Astronomy. *Elective for students in the Senior Class who have completed Course 4.*

II.—LATIN.

All of the following courses must be completed by students who would obtain the degree of A.B. All are elective for other students.

There are four recitations a week during the first two years, afterwards five.

1. Freshman Class.—Cicero, eight orations; a short Latin Essay once a week; study of Latin etymology and of Latin synonymes.

2. Sophomore Class.—Horace, the Odes; Sallust, Catiline; Horace, selections from the Satires; Cicero, De Senectute or De Amicitia; Horace, the Epistles; lectures on Roman literature.

3. Junior Class.—Allen's Remnants of Early Latin; Plautus, Trinummus; Terence, Phormio; Cicero, selected Epistles and portions of De Oratore; Livy, Books I. and XXI.; Pliny, selected Epistles; Tacitus, Agricola, portions of Germania; lectures on Roman literature.

4. Senior Class.—Lucretius, selections; Cicero, Tusculan Disputations and portions of De Officiis; Seneca, three essays; Persius, the Satires; Juvenal, selected Satires; Martial, selected Epigrams; selections from minor prose and poetical writers; lectures on Roman philosophical thought.

In connection with each course, except that of the Freshman year, there is a Seminary for critical study. Its subjects are for the present as follows:

Sophomore Year.—Ancient Life, particularly Roman; Virgil; Ovid.

Junior Year.—Ancient Art, particularly Roman; Horace; Catullus; portions of Tibullus and of Propertius.

Senior Year.—Ancient Art, particularly Roman; Horace; Plautus and Terence.

There is also offered for Juniors and Seniors, a special elective course of two periods a week.

III.—GREEK.

Greek is not required for admission to the College, but a course of three years is required for graduation with the degree of A.B., as per scheme below. Those who offer Greek on entering the College will go on in advanced classes. Those who have not previously studied the language will be required to complete the following courses:

Sophomore Class.—Goodwin's Grammar; Xenophon's Anabasis or Memorabilia (3 books).

Junior Class.—Plato's Apology of Socrates, Fernald's Greek Historians (selections), Greek Composition.

Senior Class.—Homer's Iliad or Odyssey (6 books), Sophocles (Antigone), Euripides (Hecuba), History of Greek Literature (Lectures).

IV.—GERMAN.

1. Beginning German. The Grammar, with constant practice in writing exercises; reading German ballads and easy prose; conversational exercises. Four times a week. *For those who have not previously studied German.*

2. Stories—Aus dem Leben eines Taugenichts; German plays—Eigensinn, Einer muss heirathen, etc.; exercise in writing German; conversation. Four times a week. *For those who have completed Course 1, or an equivalent.*

3. Schiller's Wilhelm Tell, Maria Stuart, etc.; dictation; writing; conversation. Twice a week. *For those who have completed Courses 1 and 2, or an equivalent amount.*

4. Goethe or Lessing; Schiller's Prose; studies in the History of German Literature; conversation and writing. Twice a week. *For those who have completed Courses 1, 2, and 3, or an equivalent amount.*

V.—FRENCH.

1. Beginning French. Magill's Grammar and Reader; writing French Exercises. Four times a week. *For those who have not previously studied French.*

2. Fénelon's Télémaque; Magill's Grammar. Four times a week. *For those who have completed Course 1, or an equivalent.*

3. Magill's Prose and Poetry; Magill's Grammar. Four times a week. *Elective for students who have completed Courses 1 and 2, or an equivalent amount.*

4. Bôcher's College Series of Plays; Dumas's Napoleon, etc.; Magill's Grammar. Twice a week. *For students who have completed Courses 1, 2, and 3, or an equivalent amount.*

5. Corneille's Cid; Racine's Athalie; Molière's Misanthrope, etc.; Familiar Lectures in French on French Literature; Magill's Grammar. Twice a week. *For students who have completed Courses 1, 2, and 3, or an equivalent amount.*

VI.—SPANISH.

Knapp's Spanish Grammar and Spanish Readings, Don Quijote, etc. Four times a week.

This Course is elective for those who have completed Courses 1 and 2 in Latin or Courses 1 and 2 in French.

VII.—ENGLISH.

1. RHETORIC AND COMPOSITION.

Freshman Class.—Review of Punctuation, Diction, Structure of Sentences and Paragraphs, Analysis of Subjects.

Themes once in four weeks in Narrative and Descriptive styles of composition.

Sophomore Class.—Kinds of Prose Composition, Style, Figures of Speech, Versification.

Miscellaneous Themes; translations from Latin, Greek, early English Prose and Poetry. Once in four weeks.

Junior Class.—Lectures on Oral and Written Discourse; Themes once in five weeks, embracing Criticisms, Argumentative Discourses.

Senior Class.—Practice in Daily Themes; Reviews or Themes suggested by the life, characteristics, or writings of standard prose authors, Philosophical and Scientific Essays. Once in five weeks.

2. ENGLISH LITERATURE.

1. A course of critical reading in authors of the nineteenth century: twice a week. This course extends over two years. *Required of Freshman and Sophomore students in Letters, and elective for other students in those classes.*

2. A course of critical reading in authors prior to the nineteenth century, from Chaucer down: four times a week, and extending through two years. *Required of Junior and Senior students in Letters, and of Junior students in Science; elective for other students in these classes.*

3. A course of lectures on English Literature, extending over two years. *Required of students in the Freshman and Sophomore Classes who elect English, and optional for others.*

VIII.—READING AND SPEAKING.

This course extends over four years. It consists of training in posture, respiration, articulation, enunciation, and especially in logical analysis. Care is taken that the student should learn to comprehend and appreciate the thought, and to give it natural and effective expression. This requires a careful study of the authors chosen, so that the course becomes to some extent one in English literature. Only pieces of acknowledged excellence are assigned, and at the end of the course the student will have studied critically and become familiar with a considerable number of them.

In the Freshman and Sophomore Classes shorter selections are made from a number of authors; in the Junior and Senior Classes attention is concentrated on a few of the great masterpieces of our literature, which are studied entire. Two periods per week counting as one. *This subject is required of all students in the Freshman and the Senior Class. In the Sophomore and the Junior Class it is elective.*

IX.—PHONOGRAPHY.

A course of lessons in Phonography; Corresponding and Reporting style. Graham's works are used as text-books. Twice a week. *Elective for students in all classes.*

X.—PHILOSOPHY AND TEACHING.

1. Logic.—One exercise a week in Logic (Jevon). *Required of the Senior Class.*

2. Mental Philosophy.—Lectures once a week with occasional examinations. The subject is presented historically, with outlines of the different schools of Philosophy. *Required of all students in the Senior Class except those in Engineering.*

Science of Education.—This is a two-years' course. The first year is devoted to the history of educational theories and systems, the class using Compayré's History of Pedagogy. Topics are assigned to the students for special study. In addition to the recitations, lectures are given on various subjects in the course.

During the second year special educational topics concerning our own country are taken up, such as the origin, growth, and needs of the public schools; private schools; normal schools; school laws;

the history of collegiate education; State aid to education; education of defectives; our educational reformers and their writings; the qualifications of a teacher; the literature of education. Two exercises a week. *Elective for students in all classes.*

XI.—HISTORY AND POLITICAL SCIENCE.

The class instruction in history and political science consists of lectures, recitations, oral and written reports by the students on various assigned topics that require the use of several standard authorities, map-drawing, and the preparation of diagrams to illustrate statistics. To encourage the study of history by means of biography, the preparation of biographical sketches of leading historical characters is required. All who intend to pursue the courses in history should be thoroughly familiar with the outlines of the history of the United States, England, and Greece, before entering the Freshman Class.

The courses offered are as follows:

1. HISTORY.

1. Freshman Class.—Roman history to the close of the fifth century A.D. Special attention is given to the religious and political institutions and the system of Roman administration. A review of the character of the Spartan and Athenian Constitutions is included in the course.

The text-books consist of the three Primers and Creighton's History of Rome, Wilkins's Roman Antiquities, and Tighe's Development of the Roman Constitution. Much additional reading in larger histories is required. Twice a week during the year. *Required of students in Arts and in Letters, and elective for others.*

2. Sophomore Class.—The character and institutions of Primitive Christianity; Teutonic Migrations; Church and State in the Middle Ages; the character and influence of the Renaissance; the eras of the Reformation and Thirty-Years' War; Text-book,—Myers's Outlines of Mediæval and Modern History; reading in other authorities, such as Bryce, Milman, Hatch, Gibbon, Motley, Fisher, Symonds, Gardner, etc.

Before taking this course students must have taken the course in Roman history. Twice a week during the year. *Required of students in Letters, and elective for others.*

3. Junior Class.—*First Half-year.*—English constitutional history and a study of the present form of government. Text-book: Green's Short History of the English People. Authorities for topical study: Stubbs, Hallam, May, Bagehot, and the English Citizen Series. Four times a week.

Second Half-year.—American political and constitutional history. The political and religious characteristics of the colonial governments are first studied, then the constitutional phases of the Revolutionary period, the formation and adoption of the present constitution, the nature of the constitution, the political and constitutional history to the close of the reconstruction period, and a study of the present form of the national government. Authorities: Johnston, Frothingham, Bancroft, Curtis, Federalist, Von Holst, Schouler, American Statesmen Series, Original Documents, etc. Four times a week. *Required of students in Letters, and elective for others.*

2. POLITICAL SCIENCE.

4. Senior Class.—Political Economy.—*First Half-year.*—The elements of political economy during the first part of the term, with Walker's Principles of Political Economy as the text-book. The course also includes a sketch of the history of political economy and the consideration of various social and industrial questions. Topics are assigned requiring reading in Mill, Thompson, Roscher, List, Marshall, Laveleye, etc.

Finance and Administration.—*Second Half-year.*—The financial history of the United States, including the history of the tariff, the internal revenue, the independent treasury, the colonial, State, and national banks, currency legislation, the administration of the Federal and State governments and comparison with European systems. Four times a week. *Required of students in Letters and in Science, and elective for others.*

XII.—NATURAL HISTORY.

1. General Biology.—This course in life-science is intended to lead students to an intelligent understanding of the phenomena of their own existence and of the living things about them. Besides its value as an element of general culture, the engendering of habits

of close observation, neat handedness, and quick perception, it will be found of special value to such as contemplate taking up the study of medicine after completing their College course. The course extends through two years, and consists of practical laboratory work accompanied by explanatory lectures. Six periods per week of exercises counting as two periods. *Required of Juniors and Seniors in Science, and elective for Juniors and Seniors in Arts, in Letters, and in Engineering.*

First Year.—Manipulation of microscope: Differences between living and lifeless bodies; differences between animals and plants; elementary structure of living bodies; elementary chemistry of animals and plants; physiological functions of animals and plants; the biology of some particular plants; the biology of some particular animals.

Second Year.—Practical studies in comparative osteology and the dissection of types of backboned animals; laboratory exercises on the embryological development of the chick.

Books of Reference.—Students will find in the general library a large number of valuable and interesting works pertaining more or less directly to Biology.

In addition to these, there will be found in the Biological Laboratory books bearing directly on the subjects studied therein and necessary each day for the proper illustration and elucidation of the topic under consideration. These books are always at the disposal of the students, but may not be removed from the laboratory during working periods.

2. Zoölogy.—The course in Zoölogy consists of two lectures a week on various groups of animals, their classification, anatomy, development, distribution, and habits; it extends over two years. *Required of Freshmen in Arts and in Letters, and of Freshmen and Sophomores in Science; elective for others in the Freshman and Sophomore classes.* Vertebrates and invertebrates are considered in alternate years, thus carrying each class over the entire field. The lectures are illustrated by means of a large collection of colored charts and diagrams, and by specimens from the very complete set of skeletons, stuffed and preserved animals, shells and fossils.

3. Elementary Botany.—Lectures, recitations, and practical laboratory work during a portion of the Sophomore year, Autumn and Spring; the time is taken from the Sophomore course in Zoölogy, the lectures of which are discontinued for the time. It is intended in this course only to teach the more prominent points in vegetal

morphology, to accustom the student to accurate observation, and to the use of the analytical key for the determination of plants.

Each student is expected to collect and prepare a given number of plants for the College herbarium.

4. Advanced Botany.—This course consists of practical laboratory work, accompanied by explanatory lectures. The determination and classification of specimens from the various orders of cryptogamic plants is taken up during a portion of the year, and the study of structural and physiological botany during the remainder.

It is intended in this course (which is open only to those who have completed the course in elementary botany) to furnish students with a working knowledge of those kinds and parts of plants commonly neglected. Mosses, Ferns, Liverworts, Grasses, Sedges, Lichens, Algæ, Fungi, etc., will be studied in turn, in so far as material and time will allow, and to an extent sufficient to enable the student to appreciate their relations and to continue the subject by himself. A conservatory, convenient to the work-tables, will furnish material for study, which will be carried on by means of simple and compound microscopes of the latest and most approved construction, and apparatus for the cutting of sections and preparation of specimens. Lectures on the geographical distribution of plants, the life histories of special cultivated plants, and on applied botany will be delivered at intervals throughout the year. A set of reference works on structural and cryptogamic botany will be found in the laboratory and is at the disposal of the students under the same conditions as the works on Biology. *Required of the Junior students in Science, and elective for Juniors in other courses.*

5. Physiology and Hygiene.—A course upon these subjects is prescribed for the young men of the Freshman Class, and a separate but similar course for the young women in that class. The time is taken from the Freshmen course in Zoölogy during the time the Sophomores are taking Botany. *Attendance required of all students in the class.*

6. Geology.—Lectures once a week throughout the year. *Required of all the students in the Senior Class.* These lectures are illustrated by numerous charts and diagrams, and by specimens from the excellent collection of typical rocks, minerals, and fossils.

7. Mineralogy.—Lectures and recitations once a week in crystallography and Descriptive Mineralogy, with two periods per week

of practice in determining minerals by their physical properties and by means of the blow-pipe; the whole counting as two periods. *Required of Senior students in Science; elective for others in that class.* Students in Mineralogy will have access to the "Leidy Collection of Minerals."

XIII.—PHYSICS.

The instruction in this subject begins in the Sophomore year and extends over three years. The courses are as follows:

Sophomore Class.—1. Mechanics of solids and fluids; Recitations with experimental illustrations, Olmstead's College Philosophy. Once a week. *Required of students in Arts and in Letters.*

2. Mechanics of solids and fluids; Recitations with experimental illustrations, from Peck's Mechanics. Twice a week. Also one laboratory exercise per week, of two periods, illustrating the subjects of the recitations; the whole course counting as three periods. *Required of students in Science and in Engineering; students in Arts and in Letters may elect this course in lieu of Course 1.*

Junior Class.—3. Lectures and recitations on Heat, Sound, Light, Electricity, and Magnetism; Olmstead's College Philosophy, and other supplementary reading. Three times a week. *Required of all students in the class.*

4. Laboratory exercises upon the subjects of Course 3. Three periods per week counting as one. *Required of students in Science and in Engineering.*

Senior Class.—5. Recitations and laboratory exercises, counting as two periods; Maxwell's Theory of Heat; Cumming's Theory of Electricity. *Required of students in Science and in Engineering.*

6. A course of laboratory work, counting as two periods per week, is arranged as an *elective for Senior students in Arts and in Letters.*

The experiments illustrate general laws in the branches of Physics and Mechanics pursued by the class during the Sophomore and Junior years.

XIV.—CHEMISTRY.

The course of instruction in this subject extends over a period of three years, and aims to impart a thorough understanding of the

most essential facts and principles of the science, while special attention is given to the cultivation of systematic habits of manipulation, so that, besides possessing value as part of a liberal education, it forms a foundation for such pursuits in life as require this knowledge.

Those who may desire to continue their work beyond the limits of the regular course will have suitable work assigned them, and will find every facility for carrying it on.

CHEMICAL LIBRARY.—In all cases students are encouraged in the habit of consulting for themselves the best authorities; and in a room near to the laboratory there will be found a number of standard works on Chemistry; among them may be mentioned Watt's "Dictionary of Chemistry;" Roscoe and Schorlemmer's "Treatise on Chemistry," besides numerous other works on technical and analytical Chemistry.

TEXT-BOOKS.—As the student advances in the course the following text-books are supplied: "Elementary Lessons in Chemistry," Roscoe; "Introduction to Qualitative Analysis," Beilstein; "Introduction to the Study of the Compounds of Carbon," Remsen; "Quantitative Chemical Analysis," Fresenius; "Theoretical Chemistry," Remsen.

First Year.—LECTURES (EXPERIMENTAL).—*a.* General Elementary Chemistry (non-metals and metals), with examinations. Three times a week counting as two periods.

b. LABORATORY-WORK.—Special Exercises on topics previously discussed in the lectures. Four periods per week counting as two.

Lectures are attended by the Freshman Class in Science and Engineering, and the Junior Class in Arts and Letters.

Laboratory-work prescribed for Freshmen in Science and Engineering, but elective for others.

Second Year.—LECTURES.—*a.* Analytical Chemistry, followed by the "Chemistry of the Compounds of Carbon." Twice a week.

b. LABORATORY-WORK.—Qualitative followed by Quantitative Chemical Analysis. Six periods a week counting as two.

This course is required of Sophomore students in Science. Laboratory-work only is required of Sophomores in Engineering. The course is elective for others.

Third Year.—LECTURES.—*a.* Modern Chemical Theories. Once a week.

b. LABORATORY-WORK.—Quantitative Analysis, followed by a few

exercises in important typical organic transformations. Nine periods per week equal three.

This course is required of the Junior students in Science, and elective for others who have completed the previous courses.

XV.—ENGINEERING.

This department, in connection with those of Mathematics, Chemistry, and Physics, is intended to give a good preparation to those students who are expecting to become either Civil or Mechanical Engineers. The studies and exercises are so arranged that the graduates will be prepared to become immediately useful in the office, works, or field, in subordinate positions, and, after a fair amount of such practice, to design and take charge of important works.

The College is well provided with the necessary field instruments, Transits, Levels, Plane-Table, etc., and each student is made familiar with their use and management by practical work in the field and draughting-room, carefully planned to illustrate the actual practice of the engineer.

The shops and draughting-rooms of this department are found described under Mechanical Laboratory, pages 14 and 15.

Regular and systematic instruction is given in the use of tools and machinery, and in processes. Patterns are made by the students, from their own designs and drawings, of machines or parts of machines, and the castings are made and properly fitted together, and finished according to the drawings.

The details of the course vary somewhat from year to year; but, in general, are represented by the following arrangement of the studies:

1. Freshman Year.—The Elements of Draughting, including the use of instruments, India ink and colors, followed by Elementary Projections, Elements of Structures, Shades and Shadows, and Isometrical Drawings, with recitations, and the construction in wood and metal of models of the more difficult drawings. Instruction in the use and care of tools begun with the vise-work in the machine-shop.

2. Sophomore Year.—Analytical Mechanics of Solids and Fluids; Descriptive Geometry, including Shades, Shadows, and Perspective,

and the careful construction of the more important problems, followed in the Spring by Land Surveying, with Field Practice and Map Drawing. Instruction in the use of tools is continued and extended to include the principal machine tools.

3. Junior Year.—*Before entering upon the work of this year the student must have completed Course 3 in Mathematics.*

Geodesy.—Theory, Adjustment and use of Engineering Field Instruments; Farm Surveying; Leveling; Topographical, Triangular, and Hydrographical Surveying.

Applied Mechanics.—Friction and other resistances; Stress and Strength of Materials.

Drawing and Mechanism.—Topographical, Structure, and Machine Drawing; Principles of Mechanism; Visits to and Sketches of Special Machinery and Structures.

Practical Exercises in the Field, in the Fall and Spring months; in pattern-making and casting in brass; and in general machine-shop practice, including the forging, shaping, tempering, use and care of tools, the filing, turning, planing, boring, etc., of the metals, the finishing and fitting up of machines or parts of machines, the setting up, testing, and management of steam-engines, boilers, and machinery throughout the year; with occasional visits to mechanical establishments, and to important engineering works in or near Philadelphia.

4. Senior Year.—*Before entering upon the work of this year, the student must have completed Course 4 in Mathematics.*

Engineering.—Theory and Practice of Road Surveying and Engineering; Building Materials; Stability of Structures; Foundations and Superstructures; Bridge Construction.

Applied Mechanics.—Practical Hydraulics; Practical Pneumatics; General Theory of Machines; Theory of Prime Movers, Steam-Engines, Turbines, etc.; Measurement of Power.

Mechanism.—Principles of Mechanism, of Machine Design, of the Transmission of Power; Construction and Use of Tools.

Drawing.—Stone-Cutting Problems; Topographical, Structure and Machine Drawing; Plans, Profiles and Sections of Road Surveys; Working Drawings.

Practical Exercises.—As in Junior Year, continued; Tests of Building Materials; Graduating Thesis.

In Drawing, Field Work and Shop Practice three periods are regarded as equivalent to one of Recitation.

XVI.—DRAWING AND PAINTING.

A course of Free-Hand Drawing and Painting is elective for all. Aside from its intrinsic value as a means of culture, it is a very important adjunct to the other courses, especially to those in Science.

It consists of Object Drawing or Painting, from still life, flowers, etc. Four times a week, counting as two. Students who have acquired sufficient skill, may join a class for sketching from nature, one afternoon during the week in Spring and Autumn.

XVII.—PHYSICAL CULTURE.

All students undergo an examination at the beginning of each year, and each individual is required to take such a course in Physical Culture as is prescribed by the Director. Subsequent examinations show the improvement made in each case. The Gymnasium is supplied with a complete set of the Sargent apparatus.

COURSES OF STUDY.

In arranging the courses of study, while recognizing the fact that the domain of human knowledge is so vast that he who would succeed best must confine his attention chiefly to some chosen field, we have endeavored not to lose sight of the equally important fact that those are best equipped for work in any particular department who have the most extended view of the realm of learning as a whole.

To secure in a measure both these results, minor courses in many of the subjects of the curriculum are required of all; while the more extended courses in each subject are taken only by those whose taste and inclination lie in that particular direction.

In pursuing this policy for several years, we have developed here four distinct lines of study. In each of them are required those subjects which are essential to the logical and natural development of the course, while a liberal allowance of elective periods gives sufficient elasticity to meet the tastes and aptitudes of all. The courses are as follows:

1. The Course in Arts, leading to the degree of Bachelor of Arts. The characteristic feature of this course is the study of Classical Antiquity, including the language and literature of the Greeks and Romans, with their art, philosophy, religion, and political and social history. Combined with this are courses in Modern Languages, Mathematics, and Science, with a considerable number of elective subjects.

While this course affords that broad culture which should be the foundation of any subsequent career, it may be made to afford special preparation for Law or Journalism by including electives in History and Political Economy, or it may be shaped in the direction of Medicine by choosing electives in Biology and Chemistry.

2. The Course in Letters, leading to the degree of Bachelor of Letters, is arranged to provide a liberal education for those who do not wish to pursue the study of the ancient languages, nor to take all the science required in the Science Course. Its leading features are a liberal amount of English, French, and German, and of History and Political Science. It includes the amount of Mathe-

matics usually prescribed in a college course, with a fair amount of Science, and a number of elective subjects, including Latin.

3. The Course in Science, leading to the degree of Bachelor of Science. The characteristic feature of this course is more extended instruction in Science than in the preceding courses, together with a fair amount of Mathematics and Modern Language study, including English. The instruction in Physics, Chemistry, and Biology is of a twofold character: first, systematic treatment in experimental lectures; secondly, practical work in the laboratories. Thus the student acquires a grounding, not only in the more important facts and fundamental principles of those sciences, but also in the correct methods of work, so that his course may form a foundation for subsequent higher work in any department of science.

4. The Course in Engineering, leading to the degree of Bachelor of Science in Engineering. This course offers, in its various studies and exercises, a training which is believed to be well adapted to the needs of Civil and of Mechanical Engineers, as well as of the large class who are to be concerned with the material interests of the country, with manufacturing, with industrial pursuits, or with any of the many other occupations allied to Engineering. It embraces liberal and technical instruction in the mathematical, physical, and graphical sciences, and their applications, in practical field engineering, in the arts of design and construction, and in the use of tools, materials, and machinery, and in processes.

STUDIES OF THE COURSE IN ARTS.

FRESHMAN YEAR.

Prescribed.—Latin, 4; French or German, 4; Mathematics, 4; Roman History, 2; Natural History, 2; Rhetoric, 1; Elocution, 1; Electives, 2: *Total*, 20 *Periods*.

Elective.—English, 2; Phonography, 2; Drawing and Painting, 2; Pedagogics, 2; Shop Work, 2.

SOPHOMORE YEAR.

Prescribed.—Latin, 4; Greek, 4; French or German, 4; Mathematics, 2; Mechanics, 1; Rhetoric, 1; Electives, 4: *Total*, 20 *Periods*.

Elective.—French, 4; German, 4; Mathematics, 2; Mechanics, 2; History, 2; English, 2; Natural History, 2; Elocution, 2; Drawing and Painting, 2; Phonography, 2; Pedagogics, 2; Shop Work, 2.

JUNIOR YEAR.

PRESCRIBED.—Greek, 5; Latin, 5; Physics, 3; Chemistry, 2; Rhetoric, 1; Electives, 4: *Total*, 20 *Periods*.

ELECTIVE.—Mathematics, 4; History, 4; English, 4; Spanish, 4; French, 2; German, 2; Biology, 2; Chemistry, 2; Elocution, 2; Latin, 2; Pedagogics, 2.

SENIOR YEAR.

PRESCRIBED.—Greek, 5; Latin, 5; Elocution, 2; Rhetoric, 1; Logic, 1; Philosophy, 1; Geology, 1; Electives, 4: *Total*, 20 *Periods*.

ELECTIVE.—Astronomy, 4; Chemistry, 4; English, 4; Spanish, 4; Political Science, 4; French, 2; German, 2; Biology, 2; Physics, 2; Pedagogics, 2; Additional Latin, 2.

In addition to the above courses all students in Arts are required to take the course in Physical Culture.

The recitation periods are each 45 minutes.

STUDIES OF THE COURSE IN LETTERS.

FRESHMAN YEAR.

PRESCRIBED.—French, 4; German, 4; Mathematics, 4; English, 2; History, 2; Rhetoric, 1; Elocution, 1; Natural History, 2: *Total*, 20 *Periods*.

SOPHOMORE YEAR.

PRESCRIBED.—French, 4; German, 4; English, 2; History, 2; Mathematics, 2; Mechanics, 1; Rhetoric, 1; Electives, 4: *Total*, 20 *Periods*.

ELECTIVE.—Latin, 4; Mathematics, 2; Mechanics, 2; Natural History, 2; Pedagogics, 2; Elocution, 2; Phonography, 2; Drawing and Painting, 2; Shop Work, 2.

JUNIOR YEAR.

PRESCRIBED.—English, 4; History, 4; French, 2; German, 2; Physics, 3; Chemistry, 2; Rhetoric, 1; Electives, 2: *Total*, 20 *Periods*.

ELECTIVE.—Chemistry, 2; Biology, 2; Elocution, 2; Phonography, 2; Drawing and Painting, 2; Pedagogics, 2. Latin may be substituted for the English prescribed above.

SENIOR YEAR.

PRESCRIBED.—English, 4; Political Science, 4; French or German, 2; Philosophy, 1; Logic, 1; Geology, 1; Rhetoric, 1; Elocution, 2; Electives, 4: *Total*, 20 *Periods*.

ELECTIVE.—Chemistry, 4; Physics, 2; Biology, 2; Spanish, 4; Drawing and Painting, 2; Mineralogy, 2; Phonography, 2; Pedagogics, 2. Latin may be substituted for the English prescribed above.

In addition to the above courses all students in Letters are required to take the course in Physical Culture.

The recitation periods are each 45 minutes.

STUDIES OF THE COURSE IN SCIENCE.

FRESHMAN YEAR.

PRESCRIBED.—Chemistry, 4; Mathematics, 4; French or German, 4; Natural History, 2; Rhetoric and Elocution, 2; Electives, 4: *Total*, 20 *Periods.*

ELECTIVE.—Engineering, 4; German or French, 4; Latin, 4; English, 2; History, 2; Drawing and Painting, 2; Phonography, 2; Pedagogics, 2.

SOPHOMORE YEAR.

PRESCRIBED.—Chemistry, 4; French or German, 4; Mechanics, 3; Natural History, 2; Mathematics, 2; Rhetoric, 1; Electives, 4: *Total*, 20 *Periods.*

ELECTIVE.—German or French, 4; Latin, 4; Mathematics, 2; History, 2; English, 2; Drawing or Painting, 2; Phonography, 2; Pedagogics, 2; Elocution, 2.

JUNIOR YEAR.

PRESCRIBED.—Physics, 4; English, 4; Chemistry, 4; Biology, 2; French or German, 2; Electives, 4: *Total*, 20 *Periods.*

ELECTIVE.—Mathematics, 4; History, 4; Latin, 4; Spanish, 4; French, 4 or 2; German, 4 or 2; Pedagogics, 2; Rhetoric and Oratory, 2.

SENIOR YEAR.

PRESCRIBED.—Biology, 2; Mineralogy and Geology, 3; Physics, 2; Logic and Philosophy, 2; Rhetoric and Oratory, 3; Political Science, 4; Electives, 4: *Total*, 20 *Periods.*

ELECTIVE.—Astronomy, 4; Chemistry, 4; Latin, 4; French, 4 or 2; German, 4 or 2; Spanish, 4; English, 4; Pedagogics, 2.

In addition to the above courses all students in Science are required to take the course in Physical Culture.

If the student has no preparation in Free-Hand Drawing before admission, he must include that subject among his electives during the Freshman Year.

The recitation periods are each 45 minutes.

STUDIES OF THE COURSE IN ENGINEERING.

FRESHMAN YEAR.

PRESCRIBED.—Engineering, 6; Mathematics, 4; Chemistry, 4; Rhetoric, 1; Elocution, 1; Electives, 4: *Total*, 20 *Periods.*

ELECTIVE.—French, 4; German, 4; English, 2; History, 2; Free-Hand Drawing, 2; Phonography, 2; Natural History, 2.

SOPHOMORE YEAR.

PRESCRIBED.—Engineering, 6; Mathematics, 4; Mechanics, 3; Chemistry, 2; Rhetoric, 1; Electives, 4: *Total*, 20 *Periods.*

ELECTIVE.—French, 4; German, 4; History, 2; English, 2; Free-Hand Drawing, 2; Natural History, 2; Phonography, 2; Elocution, 2.

JUNIOR YEAR.

PRESCRIBED.—Engineering, 6; Engineering Practice, 2; Mathematics, 4; Physics, 4; Electives, 4: *Total*, 20 *Periods.*

ELECTIVE.—Chemistry, 4; Biology, 2; French, 2 or 4; German, 2 or 4; History, 4; English, 4; Rhetoric and Elocution, 2.

SENIOR YEAR.

PRESCRIBED.—Engineering, 8; Engineering Practice, 4; Physics, 2; Geology, 1; Rhetoric, 1; Electives, 4: *Total*, 20 *Periods*.

ELECTIVE.—Astronomy, 4; Mineralogy, 2; Political Science, 4; English, 4; French, 2 or 4; German, 2 or 4; Spanish, 4; Free-Hand Drawing, 2; Biology, 2; Pedagogics, 2; Elocution, 2; Logic and Philosophy, 2.

In addition to the above courses all students in Engineering are required to take the course in Physical Culture.

If the student has had no preparation in Free-Hand Drawing before admission, he should include that subject among his electives during the Freshman Year.

The recitation periods are each 45 minutes. In Engineering Practice three periods count as one.

The following Tabular view of the *required* studies in the four courses is added for convenience of comparison.

	ARTS.	LETTERS.	SCIENCE.	ENGINEERING.
FRESHMEN.	Latin 4	German 4	Chemistry 4	Engineering . . . 6
	French or German . 4	French 4	French or German 4	Chemistry 4
	Mathematics . . . 4	Mathematics . . . 4	Mathematics . . . 4	Mathematics . . . 4
	Rhetoric 1	Rhetoric 1	Rhetoric 1	Rhetoric 1
	Elocution 1	Elocution 1	Elocution 1	Elocution 1
	Natural History. . 2	Natural History . 2	Natural History . 2	
	Roman History . . 2	Roman History . . 2		
	Elective 2	English 2	Elective 4	Elective 4
SOPHOMORES.	Latin 4	German 4	Chemistry 4	Engineering . . . 6
	Greek 4	French 4	French or German 4	Chemistry 2
	French or German . 4	English 2	Natural History . 2	
	Mathematics . . . 2	Mathematics . . . 2	Mathematics . . . 2	Mathematics . . . 4
	Mechanics 1	Mechanics 1	Mechanics 3	Mechanics 3
	Rhetoric 1	Rhetoric 1	Rhetoric 1	Rhetoric 1
		History 2		
	Elective 4	Elective 4	Elective 4	Elective 4
JUNIORS.	Greek 5	History 4	Physics 4	Engineering . . . 6
	Latin 5	English 4	English 4	Engineering Prac. 2
	Physics. 3	French or German 4	French or German 2	Mathematics . . . 4
	Chemistry 2	Physics. 3	Biology 2	Physics. 4
	Rhetoric 1	Chemistry 2	Chemistry 4	
		Rhetoric 1		
	Elective 4	Elective 2	Elective 4	Elective 4
SENIORS.	Greek 5	Political Science . 4	Political Science . 4	Engineering . . . 8
	Latin 5	English 4	Biology 2	Engineering Prac. 4
	Geology. 1	French or German 2	Physics 2	Physics 2
	Rhetoric 1	Geology 1	Geology 1	Geology 1
	Elocution. 2	Rhetoric 1	Rhetoric 1	Rhetoric 1
	Logic 1	Elocution. 2	Elocution 2	
	Philosophy 1	Logic 1	Logic 1	
		Philosophy 1	Philosophy 1	
			Mineralogy. . . . 2	
	Elective 4	Elective 4	Elective 4	Elective 4

GRADUATION AND DEGREES.

It will be seen that all the above courses of study require four years for their completion.

As a condition of graduation, each student must submit to the Faculty a satisfactory Oration or Essay, which he must be prepared to deliver in public, if required to do so.

1. THE DEGREE OF BACHELOR.

The degrees of Bachelor of Arts, of Letters, and of Science are conferred on the completion of the corresponding courses.

2. THE DEGREE OF MASTER.

Candidates for the Master's Degree are required to pursue a course of study at Swarthmore, or elsewhere, under the direction of the Faculty, and to pass examination in the same.

Persons residing at the College, and devoting their whole time to the work, can accomplish a sufficient amount in one year; for non-resident candidates, who are at the same time engaged in other work, the course must occupy not less than two years.

Applications should be made directly to the Faculty, and should state the subject or subjects in which the applicants wish to present themselves. Work will then be assigned to them by the Faculty.

The examinations for the degree will be both oral and written, and will be conducted by a committee of the Faculty, upon whose report the Faculty will decide upon the fitness of the candidate for the degree.

An extended thesis, bearing upon some part of the work assigned, will in all cases be required.

The Degree of A.M. will be given to Bachelors of Arts who comply with the above conditions.

The Degree of M.S. will be given to Bachelors of Science, who comply with the above conditions.

The Degree of M.L. will be given to Bachelors of Letters, who comply with the above conditions.

3. THE DEGREE OF CIVIL ENGINEER.

The Degree of C.E. will be given to Bachelors of Science of the Engineering Department who shall have been engaged for not less than three years, in professional practice, in positions of responsibility, and who shall present an acceptable thesis upon a subject pertaining to Civil Engineering.

Application for this Degree must be made, and the thesis presented, at least *three months* before commencement.

STUDENTS.

SENIOR CLASS.

Names.	*Courses.*	*Residences.*
Alice T. Battin	Arts	*Albany, N. Y.*
Harriett J. Cox	Science	*Malvern, Pa.*
Horace Darlington	Engineering	*Darling, Pa.*
Frederic B. Dilworth	Engineering	*Centreville, Del.*
Henry B. Goodwin	Engineering	*Bordentown, N. J.*
Anna M. Jenkins	Arts	*Gwynedd, Pa.*
Thomas A. Jenkins	Arts	*Gwynedd, Pa.*
Frederick K. Lane	Engineering	*Lancaster, Pa.*
Linda B. Palmer	Arts	*West Chester, Pa.*
Horace Roberts	Arts	*Fellowship, N. J.*
Elizabeth B. Smedley	Arts	*Willistown, Pa.*
Elizabeth B. Smith	Arts	*Lincoln, Va.*
William G. Underwood	Engineering	*Elizabeth City, N. C.*
George T. Barnsley		*Huntingdon Valley, Pa.*

JUNIOR CLASS.

Names.	*Courses.*	*Residences.*
Alice M. Atkinson	Arts	*Holicong, Pa.*
Thomas Brown	Engineering	*Lincoln, Va.*
Frank Cawley	Engineering	*Woodstown, N. J.*
Jessie L. Colson	Science	*Daretown, N. J.*
Sadie M. Conrow	Arts	*Cinnaminson, N. J.*
William L. Dudley	Engineering	*Washington, D. C.*
Robert P. Ervien	Science	*Shoemakertown, Pa.*
E. Lawrence Fell	Science	*Holicong, Pa.*
Joyeuse L. Fullerton	Arts	*Wenonah, N. J.*
Emma Gawthorp	Science	*Wilmington, Del.*
Alice Hall	Arts	*West Chester, Pa.*
P. Sharples Hall	Engineering	*Philadelphia, Pa.*
Walter Hancock	Engineering	*Philadelphia, Pa.*

Names.	*Courses.*	*Residences.*
J. Russell Hayes	Arts	*West Chester, Pa.*
Anna H. Johnson	Arts	*Muncy, Pa.*
Martha P. Jones	Arts	*Conshohocken, Pa.*
T. Montgomery Lightfoot	Science	*Germantown, Pa.*
Hetty C. Lippincott	Arts	*Riverton, N. J.*
Ellis P. Marshall, Jr.	Engineering	*London Grove, Pa.*
Maud P. Mills	Arts	*Springfield, Mass.*
Aaron C. Pancoast	Engineering	*San Antonio, Texas.*
Jessie Pyle	Arts	*London Grove, Pa.*
Joseph J. Rhoads	Engineering	*Bellefonte, Pa.*
William H. Seaman	Engineering	*Jericho, N. J.*
Marian Sharpless	Arts	*Lima, Pa.*
Amelia Skillin	Arts	*Glen Head, N. Y.*
Mary H. Smith	Arts	*Unionville, Pa.*
Carroll H. Sudler	Arts	*Sudlersville, Md.*
Charlotte M. Way	Science	*Tempe, Arizona.*
Annie E. Willits	Arts	*Syosset, N. Y.*
Esther M. Willits	Letters	*Old Westbury, N. Y.*
Frank P. Wilson	Arts	*Purcellville, Va.*
Ethelbert Ekins		*Los Angelos, Cal.*
William S. Marshall		*Milwaukee, Wis.*
Catherine M. Rider		*Brooklyn, N. Y.*

SOPHOMORE CLASS.

Names.	*Courses.*	*Residences.*
Justin K. Anderson	Engineering	*Sheffield, Pa.*
Morris L. Clothier	Science	*Wynnewood, Pa.*
Alexander G. Cummins, Jr.	Arts	*Smyrna, Del.*
Howard A. Dill	Engineering	*Richmond, Ind.*
Horace B. Forman, Jr.	Engineering	*New York, N. Y.*
Eillis M. Harvey	Engineering	*Ward, Pa.*
Clara Haydock	Letters	*New York, N. Y.*
J. Carroll Hayes	Arts	*West Chester, Pa.*
Julia Hicks	Letters	*Old Westbury, N. Y.*
Anna Holcomb	Arts	*Newtown, Pa.*
Mary Kirk	Arts	*Lumber City, Pa.*

Names.	*Courses.*	*Residences.*
Margaret J. Laurie	Arts	*Jericho, N. Y.*
Anna T. Lippincott	Letters	*Unionville, Pa.*
George A. Masters	Engineering	*Philadelphia, Pa.*
Alice S. Palmer	Arts	*West Chester, Pa.*
Elizabeth B. Parker	Letters	*West Chester, Pa.*
Louella Passmore	Arts	*Oxford, Pa.*
Frederick B. Pyle	Engineering	*London Grove, Pa.*
Ralph Stone	Arts	*Wilmington, Del.*
Elsie D. Stoner	Science	*Columbia, Pa.*
James V. Upson	Arts	*San Antonio, Texas.*
Willis W. Vail	Engineering	*Quakertown, N. J.*
J. Riley Vansant	Arts	*Fawn Grove, Pa.*
Jennie F. Waddington	Science	*Salem, N. J.*
Rebecca S. Webb	Arts	*Philadelphia, Pa.*
I. Daniel Webster	Arts	*Wakefield, Pa.*

Lucy Chandlee	*Still Pond, Md.*
Mary M. Hawley	*Media, Pa.*

FRESHMAN CLASS.

Names.	*Courses.*	*Residences.*
Alvan W. Atkinson	Arts	*Buckingham, Pa.*
John B. Atkinson, Jr.	Science	*Earlington, Ky.*
Sarah H. Atkinson	Arts	*Holicong, Pa.*
George H. Bartram	Science	*Milltown, Pa.*
Frederick T. Berdan	Engineering	*Toledo, O.*
William O. Bernard	Engineering	*New Orleans, La.*
Anna Biddle	Letters	*Riverton, N. J.*
Martha M. Biddle	Letters	*Riverton, N. J.*
Walter Black	Science	*Bordentown, N. J.*
Edgar A. Brown	Science	*Mt. Pleasant, O.*
Beulah W. Darlington	Arts	*Darling, Pa.*
Anne B. Dawson	Letters	*Uniontown, Pa.*
D. Knox Dickinson	Science	*Mast, Pa.*
Clara Evans	Arts	*Cinnaminson, N. J.*
John C. Gifford	Science	*May's Landing, N. J.*

Names.	*Courses.*	*Residences.*
Abby M. Hall	Arts	*West Chester, Pa.*
W. Everett Hunter	Engineering	*Winnetka, Ill.*
Lillian Jones	Letters	*Conshohocken, Pa.*
Samuel R. Lippincott	Science	*Cinnaminson, N. J.*
Robert S. McConnell	Science	*Philadelphia, Pa.*
J. Morton McIlvain	Engineering	*Darlington, Md.*
Fanny E. Ottley	Arts	*Austin Texas.*
Mary E. Pancoast	Arts	*Marple, Pa.*
Nellie Passmore	Science	*Oxford, Pa.*
James W. Ponder	Arts	*Milton, Del.*
Ellis B. Ridgway	Engineering	*Coatesville, Pa.*
J. Paul Roberts	Engineering	*Phœnixville, Pa.*
Phebe T. Scarlett	Arts	*Kennett Square, Pa.*
Richard C. Sellers	Engineering	*Swarthmore, Pa.*
Caroline S. Smith	Arts	*Mahanoy City, Pa.*
Fanny B. Smith	Arts	*Swarthmore College, Pa.*
Lucy R. Smith	Letters	*Uniontown, Pa.*
Mary F. Soper	Science	*Jersey City, N. J.*
William E. Sweet	Arts	*Colorado Springs, Col.*
Alice W. Titus	Letters	*Old Westbury N. Y.*
Anna B. Walker	Arts	*Emerson, Ohio.*
Mary H. White	Arts	*Lansdowne, Pa.*
Mary P. Wilkinson	Arts	*Kennett Square, Pa.*
Helen T. Willets	Letters	*Old Westbury, N. Y.*

Ellen Boothby	*Boston, Mass.*
Joseph H. Brinton, Jr.	*West Chester, Pa.*
Eleanor C. Love	*Burlington, Iowa.*
Howard M. Phillips	*Philadelphia, Pa.*
Harriet A. Smith	*Mullica Hill, N. J.*
Theodora Spencer	*Burlington, Iowa.*
Phebe P. Willis	*Old Westbury, N. Y.*

SUMMARY.

Seniors	14
Juniors	35
Sophomores	28
Freshmen	46
Total	123

SUMMARY BY STATES.

Pennsylvania	62
New Jersey	17
New York	13
Delaware	5
Maryland	3
Ohio	3
Texas	3
Virginia	3
Iowa	2
Massachusetts	2
Arizona	1
California	1
Colorado	1
District of Columbia	1
Illinois	1
Indiana	1
Kentucky	1
Louisiana	1
North Carolina	1
Wisconsin	1
Total	123

DEGREES CONFERRED IN 1886.

At the Commencement in 1886 Degrees were conferred, in course, to the following graduates:

BACHELORS OF ARTS.

HELEN GERTRUDE JOHNSON. ELLA MERRICK.
MARTHA MAGILL WATSON.

BACHELORS OF LETTERS.

EMMA STIRLING BONES. ROWLAND JESSE SPENCER.

BACHELORS OF SCIENCE.

(In Chemistry.)

CHARLES PERCY WILLCOX.

(In Engineering.)

ARTHUR STANLEY COCHRAN. GEORGE JACOBY FREEDLEY.
EDGAR MILLER SMEDLEY.

The Degree of MASTER OF ARTS was conferred, upon examination, upon
GERRIT E. HAMBLETON WEAVER
(*Class of* 1882),

and of MASTER OF LETTERS upon
CHARLOTTE ELIZABETH BREWSTER
(*Class of* 1882).

OFFICERS

OF THE

ALUMNI ASSOCIATION.

Incorporated 1882.

PRESIDENT.

P. LESLEY HOPPER, '79 . . . . . *Havre de Grace, Md.*

VICE-PRESIDENTS.

JAMES E. VERREE, '83 . . . . . 146 *North 12th Street, Philadelphia.*
JOHN B. BOOTH, '75 . . . . . *Thurlow, Pa.*
EDWARD MARTIN, M.D., '78 . . . . . 415 *South 15th Street, Philadelphia.*

SECRETARY.

BERTHA COOPER, '82 . . . . . 419 *North 5th Street, Camden, N. J.*

TREASURER.

WM. J. HALL, '78 . . . . . *Swarthmore College.*

RECORDER.

HERMAN HOOPES, '74 . . . . . 609 *Chestnut Street, Philadelphia.*

BOARD OF DIRECTORS.

The President.
The Secretary.
The Treasurer.
FLORENCE HALL, '80 . . . . . 104 *North 19th Street, Philadelphia.*
MARY J. ELLIOTT, '81 . . . . . 3204 *Summer Street, Philadelphia.*
ALBERT R. LAWTON, '80 . . . . . *Swarthmore College.*
JOSEPH FITCH, '79 . . . . . 237 *Broadway, New York.*
MARGARET E. HALLOWELL, '80 . . *Lansdowne, Pa.*
FRANK L. BASSETT, D.D.S., '76 . . . 34 *North 19th Street, Philadelphia.*

GRADUATES.

CLASS OF 1873.

Sarah H. Acton, A.B. . . . . *Salem, N. J.*
Helen Magill, A.B. (Ph.D. Boston University, 1877) . . . . . *West Bridgewater, Mass.*
Elizabeth C. (Miller) Holcomb, A.B. . . . . *Swarthmore, Pa.*
Esther T. Moore, A.B. . . . . *Swarthmore College, Pa.*
Maria C. (Pierce) Green, A.B.* . . . . . 1877.
Lowndes Taylor, A.B. . . . . *St. Paul, Minn.*

CLASS OF 1874.

Ellen H. (Evans) Price, A.M., 1884 . . . . . *Swarthmore, Pa.*
Amy W. (Hall) Hickman, A.B. . . . . *West Chester, Pa.*
Alfred T. Haviland, B.S.* . . . . . 1874.
Mary (Hibbard) Thatcher, A.B. . . . . *Henry Clay P.O., Del.*
Herman Hoopes, C. E., 1879 . . . . . *Philadelphia, Pa.*
Ferris W. Price, A.B. . . . . *Swarthmore College, Pa.*
Elizabeth S. (Woolston) Collins, A.B. . . . . *Germantown, Pa.*

CLASS OF 1875.

John B. Booth, A.B. . . . . *Thurlow, Pa.*
Helen (Comly) White, A.B. . . . . *Lansdowne, Pa.*
Franklin H. Corlies, B.S. . . . . *Philadelphia, Pa.*
Herbert G. Dow, A.B. (and Harvard 1877)* . . . . . 1878.
Lizzie (Hanes) Taylor, A.B. . . . . *Woodstown, N. J.*
Edith R. (Hooper) Roberts, A.B. . . . . *Titusville, Pa.*
Barton Hoopes, Jr., B.S. . . . . *Philadelphia, Pa.*
Oliver Keese, Jr., B.S.* . . . . . 1879.
J. Reece Lewis, B.S. . . . . *Media, Pa.*
Howard W. Lippincott, A.B. . . . . *Philadelphia, Pa.*
Martha (McIlvain) Eastwick, A.B. . . . . *Philadelphia, Pa.*
John K. Richards, A.B. (and Harvard, 1877) . . . . . *Ironton, Ohio.*
William H. Ridgway, C.E., 1879 . . . . . *Coatesville, Pa.*

CLASS OF 1876.

Frank L. Bassett, B.S. (D.D.S. Phila. Dental College, 1878) . . *Philadelphia, Pa.*
Arthur W. Bradley, A.B. . . . . *Philadelphia, Pa.*
Frances Linton, A.M., 1881 (M.D. Women's Medical College, Phila., 1886) . . . . . *Philadelphia, Pa.*
Elizabeth L. (Longstreth) Boyd, A.B. . . . . *Philadelphia, Pa.*
James T. McClure, B.S. . . . . *Philadelphia, Pa.*
Emma McIlvain, A.B. . . . . *Philadelphia, Pa.*
Edwin Mitchell, Jr., A.B. (B.L. and B.S.R., Sorbonne, Paris, 1877) . . . . . *New York, N. Y.*
Lucy R. (Price) MacIntire, A.B. (1880) . . . . . *Philadelphia, Pa.*
Isaac G. Smedley, B.S. (M.D. Hahnemann Medical College, 1879) *Philadelphia, Pa.*
Herbert W. Smyth, A.B. (Harvard, 1878, Ph.D., Göttingen, 1884) . . . . . *Johns Hopkins Univ., Balt., Md.*

* Deceased.

Mary Willits, A.M., 1881 (M.D. Women's Medical College, Phila., 1881) . . . . . *Philadelphia, Pa.*
William P. Worth, B.S. . . . . *Coatesville, Pa.*

CLASS OF 1877.

Joseph T. Bunting, B.S. (LL.B. University of Penna., 1880) . . *Philadelphia, Pa.*
Norman B. Corson, A.B. . . . . *Norristown, Pa.*
Eudora Magill, A.B. . . . . *West Bridgewater, Mass.*
Jesse R. Norton, A.B. . . . . *Ironton, Ohio.*
Carroll R. Williams, A.M., 1882 (LL.B. University of Pa., 1880). *Philadelphia, Pa.*
Florence M. Yeatman, A.B. . . . . *Norway, Pa.*

CLASS OF 1878.

Caroline E. Burr, A.B. . . . . *Germantown, Pa.*
Maybell P. Davis, A.B. . . . . *Newtonville, Mass.*
Howard Dawson, A.M., 1882 . . . . . *Boston, Mass.*
Tacy A. Gleim, A.B. . . . . *Fort Collins, Col.*
William J. Hall, B.S. . . . . *Swarthmore College, Pa.*
Mary P. Hallowell, A.M., 1881 (Women's Medical College, Phila., 1881) . . . . . *Davis Grove, Pa.*
Charles A. Hawkins, A.B. . . . . *Fawn Grove, Pa.*
William Penn Holcomb, M.L. (Ph.D. Johns Hopkins Univ., 1886). *Swarthmore College, Pa.*
Rebecca S. Hunt, A.M., 1881 (M.D. Women's Medical College, Phila., 1881) . . . . . *Philadelphia, Pa.*
Anna E. (Jackson) Monaghan, B.L. . . . . *West Chester, Pa.*
Llewellyn H. Johnson, B.S. . . . . *Orange, N. J.*
Edward Martin, A.M., 1882 (M.D. University of Penna., 1883). *Philadelphia, Pa.*
Francis J. Palmer, B.S. . . . . *Brooklyn, N. Y.*
Israel Roberts, B.S. . . . . *Camden, N. J.*
William Seaman, C.E., 1884 . . . . . *Wilmington, Del.*
C. Harry Shoemaker, B.S. . . . . *Philadelphia, Pa.*

CLASS OF 1879.

Isaac R. Coles, C.E., 1880 . . . . . *Brooklyn, N. Y.*
William P. Fender, A.B. . . . . *Philadelphia, Pa.*
William Lea Ferris, A.B. . . . . *Wilmington, Del.*
Joseph Fitch, A.B. . . . . *New York, N. Y.*
Ruth Anna Forsyth, A.B. . . . . *Moorestown, N. J.*
Elizabeth (Furnas) Bogardus, B.L. . . . . *New York, N. Y.*
P. Lesley Hopper, A.B. . . . . *Havre de Grace, Md.*
Marie A. Kemp, A.B. . . . . *Harrisburg, Pa.*
Elisha E. Lippincott, B.S. . . . . *Long Branch, N. J.*
Samuel Craig McComb, C.E., 1882 . . . . . *Downingtown, Pa.*
Charles R. Miller, B.L. (LL.B. University of Penna., 1881) . . *Wilmington, Del.*
Josephine (White) Breckens, A.B. . . . . *Cheyenne, Wyoming.*
Abigail M. (Woodnutt) Miller, B.L. . . . . *Wilmington, Del.*

CLASS OF 1880.

Anna E. Constable, A.B. . . . . *Philadelphia, Pa.*
Arthur Colman Dawson, B.L., 1882 . . . . . *Beloit, Wis.*
Florence Hall, A.B. . . . . *Philadelphia, Pa.*

Myra T. Hillman, A.B. . . . . *Washington, D.C.*
Emily L. (Hough) Savidge, A.B. (and Univ. of Minn., 1881). . *Kearney, Neb.*
Edward H. Keiser, M.S., 1881 (Ph.D. Johns Hopkins Univ., 1884) . . . . . *Bryn Mawr College, Pa.*
Georgine (Kurtz) Muhlenberg, A.B. . . . . *Reading, Pa.*
Albert R. Lawton, A.M., 1885 . . . . . *Swarthmore College, Pa.*
Robert J. Marcher, B.S. . . . . *High Bridge, N. Y.*
Thomas L. Moore, A.B. . . . . *Sandy Spring, Md.*
Ellen S. (Preston) Griest, A.B. . . . . *Lancaster, Pa.*
John Turton, B.S. . . . . *New York, N. Y.*
Fannie A. Willets, A.B. . . . . *Trenton, N. J.*
Henry S. Wood, C.E., 1883 . . . . . *Youngstown, O.*

CLASS OF 1881.

Martha Bunting, B.L. . . . . *Sharon Hill, Pa.*
William Canby, Jr., B.L. . . . . *Baltimore, Md.*
Charles B. Doron, B.L. . . . . *Elsah, Ill.*
Mary J. Elliott, B.L. . . . . *Philadelphia, Pa.*
Emma Kirk, B.L. . . . . *Bryn Mawr, Pa.*
Gertrude B. Magill, A.B. . . . . *West Bridgewater, Mass.*
Eugène Paulin, Jr., A.B. (and Harvard, 1883) . . . . . *Bloomfield, N. M.*
Martha E. (Rhinoehl) Osbourn, A.B. . . . . *Philadelphia, Pa.*
Edward C. Rushmore, B.S. . . . . *New York, N. Y.*
Henry B. Seaman, C.E., 1884. . . . . *Philadelphia, Pa.*
Charles E. Sharpless, C.E., 1884 . . . . . *Media, Pa.*
Alvin T. Shoemaker, B.L. . . . . *New York, N. Y.*
J. Byron Thomas, B.S. . . . . *Cheyney, Pa.*
Ernest F. Tucker, A.B. (M.D. Harvard, 1884) . . . . . *New York, N. Y.*

CLASS OF 1882.

William Llewellyn Baner, A.B. . . . . *New York, N. Y.*
Edith B. Blackwell, A.B. . . . . *El Mora, N. J.*
Charlotte E. Brewster, M.L., 1886. . . . . *Swiftwater, Pa.*
William Butler, Jr., A.B. . . . . *West Chester, Pa.*
C. Herbert Cochran, A.B. . . . . *Philadelphia, Pa.*
Bertha Cooper, B.L. . . . . *Camden, N. J.*
P. Fannie Foulke, A.B. . . . . *Philadelphia, Pa.*
Mary E. Gale, A.B. . . . . *Laconia, N. H.*
Sarah S. (Green) Pierce, A.B.* . . . . . 1886.
Margaret E. Hallowell, A.B. . . . . *Lansdowne, Pa.*
Elizabeth E. Hart, B.L. . . . . *Philadelphia, Pa.*
Elizabeth Haslam, B.L. . . . . *Parry, N. J.*
Elizabeth M. Ogden, B.L. . . . . *West Chester, Pa.*
Charles Palmer, A.M., 1884 . . . . . *Sandy Spring, Md.*
George C. Phillips, B.S.* . . . . . 1883.
Horace L. Rossiter, A.B. . . . . *Girard, Pa.*
Charles B. Turton, B.S. . . . . *New York, N. Y.*
Gerrit E. H. Weaver (A.B. Harvard, 1884), A.M., 1886 . . . . *Harvard College, Mass.*
Emily E. Wilson, A.M., 1885 . . . . . *Swarthmore College, Pa.*
Edgar M. Zavitz, A.B. . . . . *Coldstream, Ont., Can.*

* Deceased.

CLASS OF 1883.

Charles A. Bunting, B.S. . . . . *Sharon Hill, Pa.*
John L. Cochran, B.S. . . . . *Folly Mills, Va.*
Edgar Conrow, B.L. . . . . *Cinnaminson, N. J.*
Lydia S. Green, A.B. . . . . *Media, Pa.*
Florence N. Hanes, A.B. . . . . *Woodstown, N. J.*
Alice W. Jackson, A.B. . . . . *Germantown, Pa.*
William A. Kissam, Jr., B.S. . . . . *Little Neck, N. Y.*
Bertha Matlock, B.L. . . . . *Camden, N. J.*
Guion Miller, A.B. . . . . *Washington, D. C.*
S. Duffield Mitchell, A.B. . . . . *West Chester, Pa.*
Edward A. Pennock, A.B. . . . . *London Grove, Pa.*
George L. Pennock, B.S. . . . . *Lansdowne, Pa.*
Charles S. Pyle, B.S. . . . . *West Grove, Pa.*
Helen C. Pyle, B.L. . . . . *Wilmington, Del.*
Frederick A. Seaman, Jr., B.S. . . . . *Madison, N. J.*
Annie E. Tylor, B.L. . . . . *Media, Pa.*
James E. Verree, B.L. . . . . *Philadelphia, Pa.*
Emma Webb, A.B. . . . . *Philadelphia, Pa.*

CLASS OF 1884.

Horace L. Dilworth, B.S. . . . . *Millville, Pa.*
Rebecca M. Downing, B.L. . . . . *Philadelphia, Pa.*
John D. Furnas, B.S. . . . . *Waynesville, Ohio.*
Sarah L. Hall, A.B. . . . . *Locust Valley, N. Y.*
Henry J. Hancock, A.B. (LL.B. University of Penna., 1886) . . *Philadelphia, Pa.*
Edwin Haviland, Jr., B.S., 1885 . . . . . *Plainfield, N. J.*
Mary E. Hughes, A.B. . . . . *Philadelphia, Pa.*
Laura H. Satterthwait, A.B. . . . . *Philadelphia, Pa.*
Frederic J. Taylor, B.S. . . . . *Minneapolis, Minn.*
Mary Willits, A.B. . . . . *Philadelphia, Pa.*

CLASS OF 1885.

Minnie F. Baker, A.B. . . . . *Washington, D. C.*
Abigail Evans, A.B. . . . . *Baltimore, Md.*
Frederic P. Moore, A.B. . . . . *New York, N. Y.*
Mary D. Pratt, A.B. . . . . *West Chester, Pa.*

CLASS OF 1886.

Emma S. Bones, B.L. . . . . *New Brighton, N. Y.*
Arthur D. Cochran, B.S. . . . . *Westtown, Pa.*
George J. Freedley, B.S. . . . . *Richmond, Va.*
Helen G. Johnson, A.B. . . . . *Muncy, Pa.*
Ella Merrick, A.B. . . . . *Moorestown, N. J.*
Edgar M. Smedley, B.S. . . . . *Media, Pa.*
Rowland J. Spencer, B.L. . . . . *Philadelphia, Pa.*
Martha M. Watson, A.B. . . . . *Lexington, Ky.*
C. Percy Willcox, B.S. . . . . *Yale College, New Haven, Conn.*

Graduates and other former members of the College are requested to send their present addresses and occupations to the LIBRARIAN at the College, and to keep him informed of any changes in the same as they occur, that the list may be kept correct.

THE PREPARATORY SCHOOL.

This school is intended to prepare students for the Freshman Class in the College, or to furnish a good practical education to those desiring a shorter course.

Instruction is given in Arithmetic, Algebra, and Geometry; in Astronomy, Physics, Chemistry, Natural History, and Physical Geography; in Reading and Speaking; in Geography and History; in the English, French, German, and Latin Languages; and in Manual Training. In the subject last mentioned, there are two lines of instruction, one in Drawing, including penmanship, and the other a course in Shop-practice. The Drawing consists of: 1. Free-hand drawing, designed to educate the sense of form and proportion; to teach the eye to observe accurately, and to train the hand to delineate rapidly the forms of existing objects, or of ideal ones. 2. Mechanical Drawing, including the use of instruments and materials, the construction of geometrical problems, and the study of projections, plans, elevations, sections, intersections, and developments.

The Shop-work consists of courses of instruction in carpentry and joinery, wood-carving, wood-turning, and pattern making; in forging, drawing out, upsetting, bending, punching, and welding iron and steel; in making and tempering tools; in moulding and casting in plaster, type-metal, brass, and iron. All the exercises are purely educational; no attempt being made to teach a trade.

The Mechanical Drawing and Shop-practice are elective, and pupils taking them must also elect either Latin, French, or German; other pupils take two of those languages. The English Language and the remaining studies are required of all.

It is expected that parents will not ask to have the course modified, except in the case of the few whose health will not admit of their doing the full amount of work prescribed.

Pupils preparing for the College course in Arts, should take the Latin with French or German; those preparing for the course in Letters, are permitted in the last year of the course to substitute

German for the Latin; as preparation for the course in Science, pupils may take any two of the electives offered; but for the Engineering course, preparation should be made in Mechanical Drawing and Shop-practice. The course in metal-working, pursued by the Freshman and Sophomore Classes, forms with the shop-work offered in this school a regularly graded course in that subject. (See Course in Engineering, pages 42–43.)

Members of the First and Second Classes, who are over 18 years of age, may attend the College lectures on Pedagogics. Those who expect to teach the following year may substitute, for a part of the regular work, a thorough review of Arithmetic and the other elementary branches usually included in the examination of teachers for the public schools.

In arranging the course of study, we have had in view a complete and harmonious organization of all Friends' schools throughout the country; and it is hoped that committees and teachers of these schools will unite with us in securing this very important end. In all Friends' schools whose grade is so adjusted that certain classes, in the judgment of the Faculty, correspond with ours, students who complete the course of study in any class will be admitted to the class in this school, corresponding with the next higher in their own, without re-examination, on presenting certificates to that effect from the Principals of their respective schools.

INSTRUCTORS.

EUGÈNE PAULIN, A.M.,
Superintendent of Discipline of the boys and Instructor in French.*

SAMUEL S. GREEN, M.S.,
Physics.

ESTHER T. MOORE, A.B.,
In charge of Study Room.

SUSAN W. GILLAM,
Reading and Speaking.

MINNIE S. BLAKIE,
Writing, Spelling, and English.

ALBERT R. LAWTON, A.M.,
German and French.

EMILY E. WILSON, A.M.,
Mathematics.

BEATRICE MAGILL,
Drawing and Painting.

FERRIS W. PRICE, A.B.,
Latin and English.

ALBERT G. PALMER, Ph.D.,
Chemistry.

WILLIAM PENN HOLCOMB, Ph.D.,
History and Civil Government.

BENJAMIN SMITH, A.M.,
History and Geography.

EDGAR L. BROTHER,
Metal Working.

MILTON H. BANCROFT,
Industrial Drawing.

FREDERICK A. CHOUTEAU,
Wood-working and Foundery Practice.

MARY J. MURPHY,
Teacher of Gymnastics.

* The Discipline of the girls is in charge of the Matron of the College.

CONDITIONS OF ADMISSION.

Application for admission should be made in writing to the PRESIDENT of the College, and should in all cases be accompanied by a testimonial of good character from the pupil's last teacher.

Examinations for admission and classification will be held on Fourth- and Fifth-days, the 14th and 15th of Ninth month, 1887. Candidates must present themselves on the afternoon of Third-day, Ninth month 13th, 1887.

The pupils of this school are divided into three classes,—*First*, *Second*, and *Third*. For admission to the Third, or lowest class, the pupil must be at least fourteen years of age, and must be prepared in the following subjects:

Arithmetic.—The Fundamental Rules; Denominate Numbers; Common and Decimal Fractions; Percentage and Interest.

English.—The Parts of Speech; Analysis, and Parsing of Simple Sentences; the use of Capitals and Spelling.

Geography.—Descriptive and Political Geography of all countries, especially of North America.

History.—The History of the United States as found in the school histories.

Pupils from the schools named on page 24, will not be examined, but will be classified as recommended by the Principals of those schools. A written statement in regard to scholarship, from the pupil's last teacher, will, in all cases, receive due consideration.

Pupils who are well prepared in Arithmetic will be received if they are deficient in some of the other subjects. They will receive special instruction until they are fitted to regularly enter the class. It is advised, however, that pupils, before coming, be well prepared in all the subjects.

EXPENSES.

The charges for board and tuition and other expenses are found on pages 20–21.

COURSE OF STUDY.

THIRD CLASS.

Arithmetic.—Percentage and its applications; Partnership; Ratio and Proportion; Involution and Evolution; Progressions.

Algebra.—Addition, Subtraction, Multiplication and Division; Simple Equations; Fractions.

English.—Practice in Composition; Essential Principles of the Grammar; Analysis of Sentences; Selections from Whittier and Irving.

Latin.—Leighton's Latin Lessons; Bennett's Easy Latin Stories.

History.—History of the United States.

Geography.—Review of Descriptive and Political Geography.

Reading.—Practice in Reading and Declaiming before the class.

Spelling.—Selected Words; Dictation Exercises; Correction of misspelled words in all written exercises.

Writing.—The Spencerian System.

Drawing.—Free-hand Object Drawing and Perspective.

Physical Culture.—Exercises in the Gymnasium, as prescribed in each case by the Director.

SECOND CLASS.

Mathematics.—Algebra to Quadratics; Geometry, Books I., II., and III.

English.—Composition; Grammar; Selections from Longfellow and Hawthorne.

History.—History of England.

Geography.—Physical Geography.

Chemistry.—Lectures.

Reading.—Practice in Reading and Declaiming before the class.

Spelling.—Selected words; Dictations; Correction of misspelled words in all written exercises.

Writing.—The Spencerian System.

Drawing.—Free-hand Object Drawing and Perspective.

Physical Culture.—Exercises in the Gymnasium, as prescribed in each case by the Director.

Elective Studies.

(Two must be chosen.)

1. **Latin.**—a. *Reading:* Cæsar, Gallic War, two books; Virgil's Æneid, one book.

b. *Grammar:* Irregular Verbs; syntax of the cases.

c. *Composition:* Allen's Latin Composition and work based on the Latin read.

2. **French.**—Magill and Paulin's First Lessons in French; Magill's French Reader.

3. **Manual Training.**—Wood-working (8 = 4); Industrial Drawing, with instruments and free-hand. Pupils electing Manual Training omit the prescribed drawing above.

FIRST CLASS.

Mathematics.—Geometry through Book V.; Review of Arithmetic; Algebra through Quadratic Equations of one unknown quantity.

English.—Rhetoric and Composition; a brief outline of the history of English Literature; Selections from Bryant and Lowell.

History and Civil Government.—Smith's Smaller Greece and Macy's Our Government.

Natural History.—Lectures on Physiology and Hygiene.

Physics.—Lectures and Recitations.

Astronomy.—Descriptive Astronomy, with practice in finding the constellations and the principal stars.

Reading.—Practice in Reading and Declaiming before the class.

Spelling.—Selected words and Dictation Exercises; Correction of misspelled words in all written exercises of the class.

Writing.—The Spencerian System.

Drawing.—Free-hand Object Drawing and Perspective.

Physical Culture.—Exercises in the Gymnasium, as prescribed for each individual by the Director.

Elective Studies.

(Two must be chosen.)

1. **Latin.**—a. *Reading:* Virgil's, Æneid, five books.

b. *Grammar:* Uses of the moods.

c. *Composition:* Allen's Latin Composition and work based on the Latin read.

d. *Supplementary Study:* Classical Geography and Classical Mythology.

2. **French.**—Magill's Grammar and Reader.

3. **German.**—Grammar and Practice in Writing Exercises; Ballads and easy Prose.

4. **Manual Training.**—Forging, etc., and Foundery Practice (8=3); Industrial Drawing, Mechanical and Free-hand. Pupils electing Manual Training may omit the drawing prescribed above.

PERIODS OF RECITATIONS PER WEEK.

The following table shows the number of exercises per week for each class, the periods being forty-five minutes each; except for spelling, in which three periods of fifteen minutes each count as one:

	STUDIES.	THIRD.	SECOND.	FIRST.
REQUIRED.	Mathematics	4	4	4
	Latin	5	. . . .	. . . .
	History	3	2	3
	English	3	2	1
	Reading and Speaking	3	2	2
	Spelling	2	1	1
	Geography	3	1	. . . .
	Physiology	. . . .	. . . .	1
	Writing	2	2	1
	Drawing	2	2	2
	Chemistry	. . . .	1	. . . .
	Physics and Astronomy	. . . .	. . . .	2
ELECTIVE.*	Latin	. . . .	4 or 5	4
	French	. . . .	4	4
	German	. . . .	. . . .	4
	Manual Training	. . . .	4	4
		27	25	25

PERCENTAGE OF TIME OCCUPIED.

English	21.8 per cent.	French	10.2 per cent.
Latin	18.0 "	History	10.2 "
Mathematics	15.4 "	Science	5.1 "
Writing & Drawing	12.8 "	Geography	5.1 "
Manual Training	12.8 "	German	5.1 "

* Of these subjects the pupil must elect *two*.

PUPILS IN PREPARATORY SCHOOL.

FIRST CLASS.

Henry Bancroft	*Philadelphia, Pa.*
Helen P. Barnard	*Doe Run, Pa.*
Sarah I. Black	*Millsboro', Del.*
Harry L. Boggs	*Charleston, W. Va.*
George Bones	*New York, N. Y.*
Joseph Bringhurst	*Marshallton, Del.*
Lucy C. Brinton	*Christiana, Pa.*
Elizabeth Chadwick	*Quaker St., N. Y.*
M. Jennie Chandler	*Philadelphia, Pa.*
Louis P. Clark	*Philadelphia, Pa.*
Elizabeth A. Cornett	*Phœnixville, Pa.*
Grant Dibert	*Johnstown, Pa.*
George Dilworth	*Dilworth, Montana.*
Genevieve Elder	*Johnstown, Pa.*
Elva Gregg	*Philadelphia, Pa.*
Clarence Griffin	*Santa Fé, N. M.*
Eliza R. Hampton	*Spring Brook, N. Y.*
Jesse A. Hays	*New York, N. Y.*
Clifford S. Jacoby	*Philadelphia, Pa.*
Annie M. Kent	*Lincoln University, Pa.*
Dora Lewis	*Media, Pa.*
Lena M. Lewis	*Media, Pa.*
Nora H. Lippincott	*Riverton, N. J.*
Margaret S. Marshall	*Trenton, N. J.*
Jessie W. Masters	*Philadelphia, Pa.*
Howard W. Middleton, Jr.	*Philadelphia, Pa.*
H. Graham Millar	*Wyoming, O.*
William A. Mode	*Modena, Pa.*
D. Herbert Pike	*Meredosia, Ill.*
J. Frederick Pike	*Meredosia, Ill.*
Edwin S. Potter	*Philadelphia, Pa.*

Paul Potter . . . . . *Toledo, O.*
Sarah M. Preston . . . . . *Darlington, Md.*
Isaac C. Rogers . . . . . *Moorestown, N. J.*
Ada P. Sager . . . . . *Lenape, Pa.*
Marcus W. Saxman . . . . . *Latrobe, Pa.*
Josephine W. Scott . . . . . *Philadelphia, Pa.*
Arthur Seligman . . . . . *Santa Fé, N. M.*
Minnie Seligman . . . . . *Santa Fé, N. M.*
Matilda H. Slocum . . . . . *San Antonio, Texas.*
Andrew F. Stevens . . . . . *Philadelphia, Pa.*
Frederick S. Stimson . . . . . *Chicago, Ill.*
Evangeline Vail . . . . . *Quakertown, N. J.*
William E. Whitson . . . . . *Westbury Station, N. Y.*
Susan R. Wilkins . . . . . *Lumberton, N. J.*
Richard M. Willis . . . . . *Galveston, Texas.*
Edward C. Wilson . . . . . *Bloomfield, Ontario, Can.*
M. Lilian Yarnall . . . . . *Ward, Pa.*

IRREGULAR.

M. Rosamond Baker . . . . . *Easton, N. Y.*
Hannah H. Clothier . . . . . *Wynnewood, Pa.*
Alice E. Mann . . . . . *Colden, N. Y.*
Mary R. Phillips . . . . . *New York, N. Y.*
Laura Spear . . . . . *Wilmington, Del.*
Elizabeth H. West . . . . . *King of Prussia, Pa.*

SECOND CLASS.

Bruce Axtell . . . . . *Santa Fé, N. M.*
Edward T. Betts . . . . . *Buffalo, N. Y.*
William A. Christy . . . . . *Bloomfield, Ontario, Can.*
J. Russell Cornell . . . . . *Holland, Pa.*
Walter Dalton . . . . . *Philadelphia, Pa.*
Sarah C. DeHaven . . . . . *Westtown, Pa.*
Stanley M. Dickinson . . . . . *Cincinnati, Ohio.*
Frank E. Dill . . . . . *Richmond, Ind.*
Albert B. Enbody . . . . . *Mauch Chunk, Pa.*
Francis S. Garrett . . . . . *Wilmington, Del.*
Etta M. Gilbreath . . . . . *Fort Buford, Da.*

John S. C. Harvey . . . . . *Columbus, N. J.*
Thomas E. Harvey . . . . . *Columbus, N. J.*
William C. R. Hazard . . . . . *Buffalo, N. Y.*
Richard Hendrickson . . . . . *Washington, D. C.*
Franklin E. Hobson . . . . . *Philadelphia, Pa.*
John H. Hubbs . . . . . *Doylestown, Pa.*
M. Franklin Jackson . . . . . *Jericho, N. Y.*
Marietta R. Kirk . . . . . *Glenolden, Pa.*
S. Clarence Lemmon . . . . . *Honeybrook, Pa.*
Florence W. Matthews . . . . . *Philopolis, Md.*
Charles R. McCrea . . . . . *Renovo, Pa.*
Henry L. McDonald . . . . . *Kansas City, Mo.*
Gabriel Middleton . . . . . *Philadelphia, Pa.*
Spencer Miller . . . . . *Oakdale, Pa.*
Henry E. Nelson . . . . . *Brooklyn, N. Y.*
Edward M. Philips . . . . . *Faulkland, Del.*
Arthur Prentiss . . . . . *New York, N. Y.*
Mary R. Price . . . . . *Towson, Md.*
Henry F. Randolph . . . . . *Johnstown, Pa.*
Elmo T. Rice . . . . . *Lansdowne, Pa.*
Emma H. Rogers . . . . . *Medford, N. J.*
Albert Saunders . . . . . *Huntingdon Valley, Pa.*
James Seaman . . . . . *Jericho, N. Y.*
Hannah T. Shreve . . . . . *Mt. Holly, N. J.*
Marian W. Sloan . . . . . *Swarthmore, Pa.*
John B. Stetson . . . . . *Lansdale, Pa.*
Thomas Turnbull, Jr. . . . . *Muskegon, Mich.*
Herman R. Tyson . . . . . *Village Green, Pa.*
William Wagner . . . . . *Philadelphia, Pa.*
William H. Wilson . . . . . *St. Joseph, Mo.*
James N. Wood . . . . . *Washington, D. C.*

THIRD CLASS.

Constantine Cuadra . . . . . *Managua, Nicaragua.*
Mahlon H. Dickinson . . . . . *West Grove, Pa.*
M. Alverda Fowler . . . . . *Elizabeth City, N. C.*
Preston B. Jones . . . . . *Coatesville, Pa.*
Lillian M. Ketcham . . . . . *Mt. Kisco, N. Y.*

Alberto Lagrave . . . . . *Mexico.*
Mary P. Lardner . . . . . *Lansdale, Pa.*
Meta Lardner . . . . . *Lansdale, Pa.*
Robert C. Manning . . . . . *Trenton, N. J.*
Margaret O. Millar . . . . . *Wyoming, Ohio.*
Joseph M. Pugh . . . . . *Port Deposit, Md.*
Thomas Ross . . . . . *New Orleans, La.*
Moina M. Sandford . . . . . *St. Joseph, La.*
Sarah Shaw . . . . . *Pittsburg, Pa.*
Edward Sloan . . . . . *Swarthmore, Pa.*
Arthur Staab . . . . . *Santa Fé, N. M.*
Julius Staab . . . . . *Santa Fé, N. M.*
Albert M. Stiles . . . . . *Volcano, West Va.*
Halbert L. Stone . . . . . *Mt. Pleasant, Md.*
Clarence M. Thompson . . . . . *Philadelphia, Pa.*
Frank W. Tyler . . . . . *Ridgely, Md.*

SUMMARY.

First Class	54
Second Class	42
Third Class	21
Total	117

SUMMARY BY STATES.

Pennsylvania	49
New York	15
New Jersey	10
Maryland	6
New Mexico	6
Delaware	5
Ohio	4
Illinois	3
Canada	2
District of Columbia	2
Louisiana	2
Missouri	2
Texas	2
West Virginia	2
Dakota	1
Indiana	1
Mexico	1
Michigan	1
Montana	1
Nicaragua	1
North Carolina	1
Total in Preparatory School	117
Total in College	123
Whole number	240

COMMITTEE

ON

Trusts, Endowments, and Scholarships.

Joseph Wharton, P. O. Box 1332, Philadelphia, Pa.

Daniel Underhill, Jericho, L. I.

Edward H. Ogden, 314 Vine Street, Philadelphia, Pa.

John T. Willets, 303 Pearl Street, New York City, N. Y.

M. Fisher Longstreth, Secretary and Treasurer,

Sharon Hill, Delaware County, Pa.