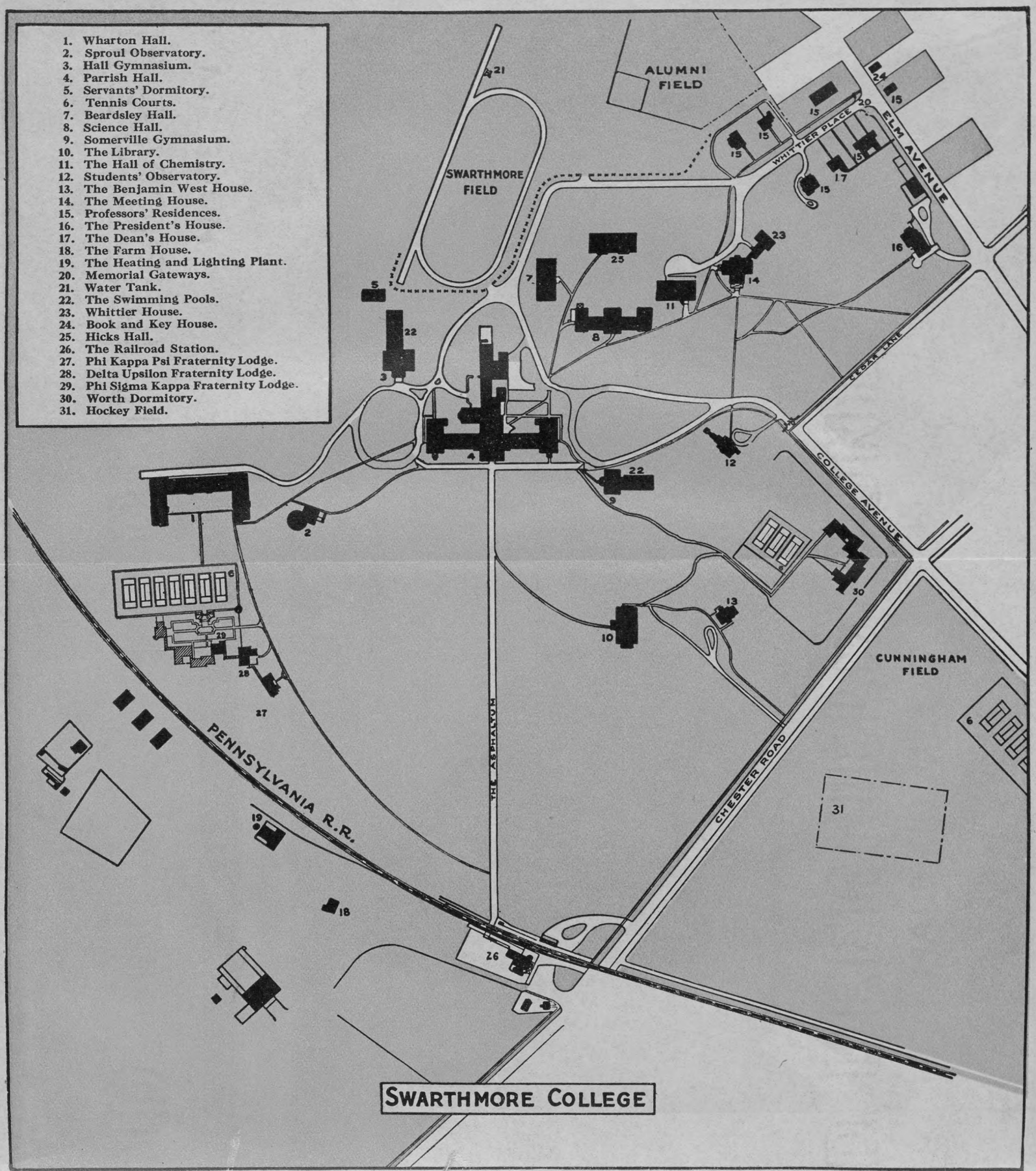
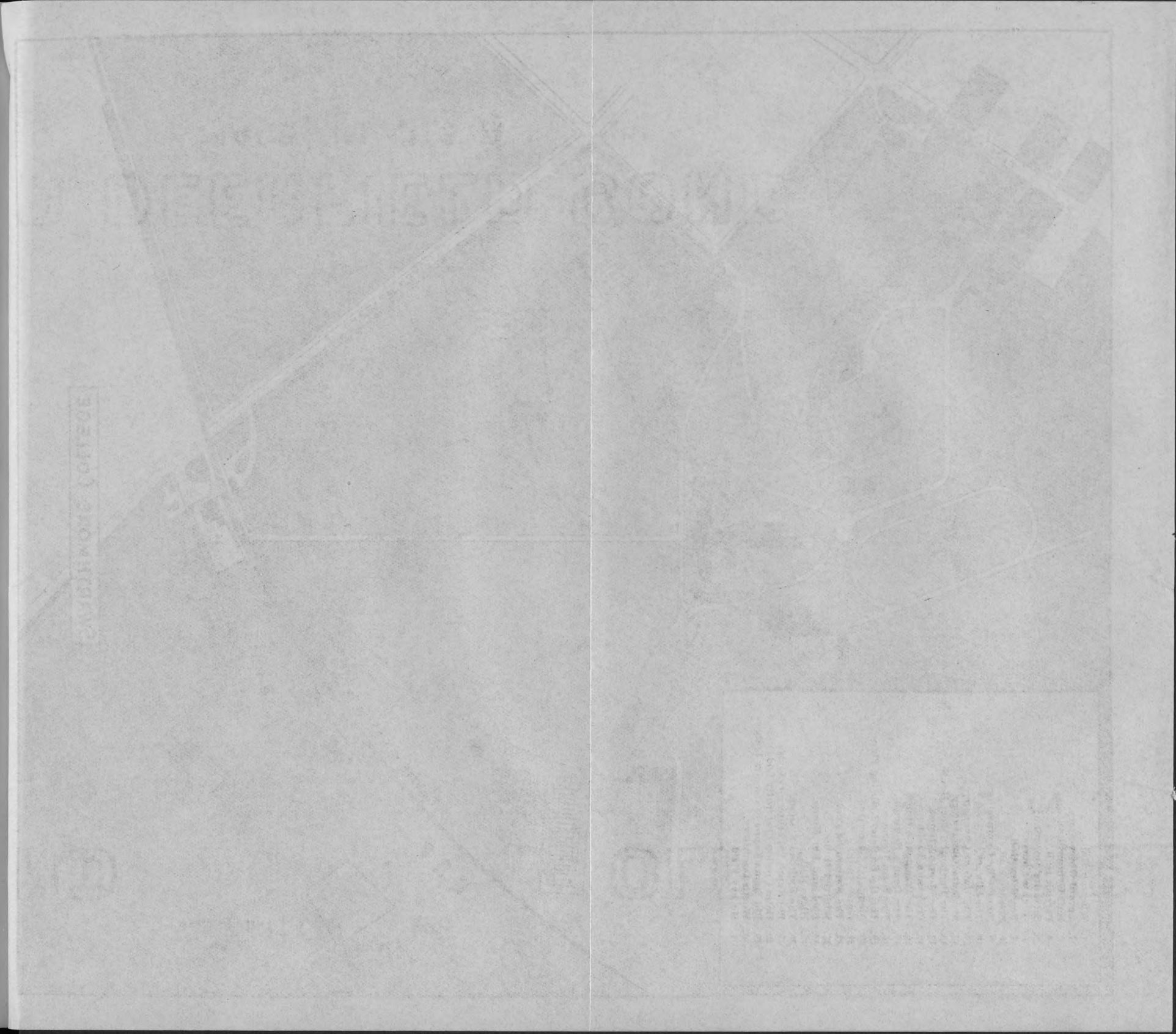

1. Wharton Hall.
2. Sproul Observatory.
3. Hall Gymnasium.
4. Parrish Hall.
5. Servants' Dormitory.
6. Tennis Courts.
7. Beardsley Hall.
8. Science Hall.
9. Somerville Gymnasium.
10. The Library.
11. The Hall of Chemistry.
12. Students' Observatory.
13. The Benjamin West House.
14. The Meeting House.
15. Professors' Residences.
16. The President's House.
17. The Dean's House.
18. The Farm House.
19. The Heating and Lighting Plant.
20. Memorial Gateways.
21. Water Tank.
22. The Swimming Pools.
23. Whittier House.
24. Book and Key House.
25. Hicks Hall.
26. The Railroad Station.
27. Phi Kappa Psi Fraternity Lodge.
28. Delta Upsilon Fraternity Lodge.
29. Phi Sigma Kappa Fraternity Lodge.
30. Worth Dormitory.
31. Hockey Field.
ALUMNI FIELD
SWARTHMORE FIELD
WHITTIER PLACE
ELM AVENUE
CEDAR LANE
COLLEGE AVENUE
CUNNINGHAM FIELD
THE ASPHALTUM
CHESTER ROAD
PENNSYLVANIA R.R.
SWARTHMORE COLLEGE



SWARTHMORE COLLEGE BULLETIN

CATALOGUE NUMBER

FIFTY-SIXTH YEAR

1924-1925

SWARTHMORE, PENNSYLVANIA

Printed for the College

Vol. XXII, No. 3 Third Month, 1925

Entered at the Post-Office at Swarthmore, Pa., as second-class matter

SESSION DAYS OF COLLEGE IN BOLD-FACE TYPE

1925

January

S	M	T	W	T	F	S
				1	2	3
4	5	**6**	**7**	**8**	**9**	**10**
11	**12**	**13**	**14**	**15**	**16**	**17**
18	**19**	**20**	**21**	**22**	**23**	**24**
25	**26**	**27**	**28**	**29**	30	31

February

S	M	T	W	T	F	S
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March

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29	**30**	**31**				

April

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May

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					1	**2**
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24	**25**	**26**	**27**	**28**	**29**	**30**
31						

June

S	M	T	W	T	F	S
	1	**2**	**3**	**4**	**5**	**6**
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July

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September

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27	**28**	**29**	**30**			

October

S	M	T	W	T	F	S
				1	**2**	**3**
4	**5**	**6**	**7**	**8**	**9**	**10**
11	**12**	**13**	**14**	**15**	**16**	**17**
18	**19**	**20**	**21**	**22**	**23**	24
25	**26**	**27**	**28**	**29**	**30**	**31**

November

S	M	T	W	T	F	S
1	**2**	**3**	**4**	**5**	**6**	**7**
8	**9**	**10**	**11**	**12**	**13**	**14**
15	**16**	**17**	**18**	**19**	**20**	**21**
22	**23**	**24**	**25**	26	27	28
29	**30**					

December

S	M	T	W	T	F	S
		1	**2**	**3**	**4**	**5**
6	**7**	**8**	**9**	**10**	**11**	**12**
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20	21	22	23	24	25	26
27	28	29	30	31		

1926

January

S	M	T	W	T	F	S
					1	2
3	4	**5**	**6**	**7**	**8**	**9**
10	**11**	**12**	**13**	**14**	**15**	**16**
17	**18**	**19**	**20**	**21**	**22**	**23**
24	**25**	**26**	**27**	**28**	29	30
31						

February

S	M	T	W	T	F	S
	1	**2**	**3**	**4**	**5**	**6**
7	**8**	**9**	**10**	**11**	**12**	**13**
14	**15**	**16**	**17**	**18**	**19**	**20**
21	22	**23**	**24**	**25**	**26**	**27**
28						

March

S	M	T	W	T	F	S
	1	**2**	**3**	**4**	**5**	**6**
7	**8**	**9**	**10**	**11**	**12**	**13**
14	**15**	**16**	**17**	**18**	**19**	**20**
21	**22**	**23**	**24**	**25**	**26**	**27**
28	29	30	31			

April

S	M	T	W	T	F	S
				1	2	3
4	5	**6**	**7**	**8**	**9**	**10**
11	**12**	**13**	**14**	**15**	**16**	**17**
18	**19**	**20**	**21**	**22**	**23**	**24**
25	**26**	**27**	**28**	**29**	**30**	

May

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9	**10**	**11**	**12**	**13**	**14**	**15**
16	**17**	**18**	**19**	**20**	**21**	**22**
23	**24**	**25**	**26**	**27**	**28**	**29**
30	**31**					

June

S	M	T	W	T	F	S
		1	**2**	**3**	**4**	**5**
6	**7**	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

COLLEGE CALENDAR

1925

First Month 6.....College Work resumes at 8.00 A. M.
First Month 23.....Registration and Enrollment in Classes for the Second Semester 9.00 A. M. to 12 M.
First Month 23.....Mid-Year Examinations begin at 2.00 P. M.
First Month 29.....First Semester ends.
Second Month 2.....Second Semester begins.
Second Month 23.....College Work suspended for the day.
Third Month 10.....Meeting of Board of Managers.
Fourth Month 4.....College Work ends at noon for the Spring Recess.
Fourth Month 14.....College Work resumes at 8.00 A. M.
Sixth Month 5.....Final Examinations begin.
Sixth Month 11.....Final Examinations end.
Sixth Month 12.....Meeting of Board of Managers.
Sixth Month 12.....Class Day.
Sixth Month 13.....Alumni Day.
Sixth Month 14.....Baccalaureate Day.
Sixth Month 15.....*Commencement*
Sixth Month 16 to Ninth Month 16 Summer Recess.
Ninth Month 15.....Freshmen Orientation Day.
Ninth Month 16.....Matriculation, Registration and Enrollment in Classes.
Ninth Month 17.....College Work begins at 8.00 A. M.
Tenth Month 6.....Meeting of Board of Managers.
Tenth Month 24.....Founders' Day. Class Work suspended for the day.
Eleventh Month 25.....College Work ends at 1.00 P. M. for the Thanksgiving Recess.
Eleventh Month 30.....College Work resumes at 8.00 A. M.
Twelfth Month 1.....Annual Meeting of the Corporation.
Twelfth Month 19.....College Work ends at noon for the Christmas recess.

1926

First Month 5.....College Work resumes at 8.00 A. M.
First Month 21.....Registration and Enrollment in Classes for the Second Semester 8.30 A. M. to 12 M.
First Month 21.....Mid-Year Examinations begin at 2.00 P. M.
First Month 28.....First Semester ends.
Second Month 1.....Second Semester begins.
Second Month 22.....College Work Suspended for day.
Third Month 9.....Meeting of Board of Managers.
Third Month 27.....College Work ends at noon for Spring recess.
Fourth Month 6.....College Work resumes at 8.00 A. M.
Fifth Month 28.....Final Examinations begin.
Sixth Month 3.....Final Examinations end.
Sixth Month 4.....Meeting of Board of Managers.
Sixth Month 4.....Class Day.
Sixth Month 5.....Alumni Day.
Sixth Month 6.....Baccalaureate Day.
Sixth Month 7.....*Commencement.*

TABLE OF CONTENTS

THE CORPORATION

WILSON M. POWELL, *President*,
7 Wall Street, New York.

CHARLES F. JENKINS, *Vice President*,
232 South Seventh Street, Philadelphia.

HETTY LIPPINCOTT MILLER, *Secretary*,
Riverton, N. J.

E. PUSEY PASSMORE, *Treasurer*,
307 Chestnut Street, Philadelphia.

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Term expires Twelfth Month, 1925

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HOWARD COOPER JOHNSON, 2113 Packard Bldg., Philadelphia.
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ESTHER H. CORNELL, 43 Willow Street, Brooklyn, N. Y.
ROBERT E. LAMB, 841 North Nineteenth Street, Philadelphia.

Term expires Twelfth Month, 1926

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ROBERT PYLE, West Grove, Pa.
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FRANCES M. WHITE, Cardington, Pa.

Term expires Twelfth Month, 1927

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PHILIP M. SHARPLES, West Chester, Pa.
MARY HIBBARD THATCHER, Swarthmore, Pa.
MARY WHARTON MENDELSON, 639 Church Lane, Germantown, Philadelphia.
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Term expires Twelfth Month, 1928

EMMA C. BANCROFT, Wilmington, Del.
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WILLIAM W. COCKS,
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ABIGAIL FOULKE PIM,
MARY HIBBARD THATCHER,
MARY LIPPINCOTT GRISCOM.

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HENRY C. TURNER,
JOSEPH SWAIN,
EDWARD B. TEMPLE.

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324 Cedar Lane

JOSEPH SWAIN, LL.D., *President Emeritus of the College*.....Swarthmore

JOHN ANTHONY MILLER, Ph.D., F. R. A. S., *Vice-President of the College and Edward H. Magill Professor of Mathematics and Astronomy*....
Cunningham House

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CLARA PRICE NEWPORT‡, Ph.D., *Professor of the German Language and Literature*.....730 Ogden Avenue

THOMAS KLINGENBERG URDAHL, Ph.D., *Professor of Economics*.....
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---

* Arranged, with the exception of the administrative officers, in the order of appointment in the different grades.
† Absent on leave, Second Semester, 1924-25.
‡ Absent on leave, 1924-25.

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730 Ogden Avenue

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† Absent on leave 1924-25.

PAUL M. PEARSON, Litt.D., *Honorary Lecturer in Public Speaking*.....
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West House

MERCEDES C. IRIBAS, *Instructor in Spanish*.....
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WALTER ANTONIO MÁTOS, B.A., F. R. A. S., *Volunteer Observer in the Sproul Observatory*.....309 College Avenue

FRANK FITTS, *Assistant in the Physical Education of the Men*.....
216 S. Chester Road

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AMELIA MOTT GUMMERE.....Haverford

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JANE P. RUSHMORE.....Riverton, N. J.

CAROLINE J. WORTH.....West Chester

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JOHN ANTHONY MILLER, Ph.D., *Vice-President.*

RAYMOND WALTERS, M.A., *Dean.*

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MARTHA BAER, *Assistant Matron of Parrish Hall.*

MARY E. COOK, *Director of the Laundry.*

DOLLIE B. COLEMAN, *Graduate Nurse in Parrish Hall.*

SUSAN S. HAINES, *Graduate Nurse in Wharton Hall.*

† Absent on leave, Second Semester, 1924-25.

SWARTHMORE COLLEGE

Swarthmore College is situated in the Borough of Swarthmore, eleven miles southwest of Philadelphia on the Octoraro branch of the Pennsylvania Railroad. Swarthmore is connected with Broad Street Station by nineteen inbound and twenty-two outbound trains daily, the running time of which varies from nineteen minutes on express schedule to thirty-six minutes on the local schedule. Three trolley lines, running cars at fifteen- to thirty-minute intervals, also connect with Philadelphia elevated and surface lines.

The College buildings and campus occupy a commanding position upon a wooded hill not far from the center of the town. The Delaware River is about four miles distant. More than two hundred acres are contained in the College property, including a large tract of woodland and the beautiful rocky valley of Crum Creek.

There are over twenty College buildings.

The enrollment of the College is limited to five hundred students.

The total of the College endowment is more than three million dollars.

The College was founded in 1864 through the efforts of members of the Religious Society of Friends, for the purpose of securing to the youth of the Society an opportunity for higher educational training under the guarded supervision and care of those of their own religious faith. Other applicants are admitted on the same terms as Friends, and nothing of a sectarian character exists in the instruction or in the management of the College. According to its first charter, membership on the Board of Managers of the College was limited to persons belonging to the Society of Friends. The purpose of this restriction was not to establish sectarian control, but to prevent forever the possibility of such control by any sectarian element which might otherwise have come to be represented on the Board. This

restriction is now believed to be no longer needed and is omitted from the revised charter. The intention of its founders was to make the promotion of Christian character the first consideration, and to provide opportunities for liberal culture while maintaining a high standard of scholarship. These aims have been followed in the administration of the institution.

BUILDINGS

Parrish Hall is a massive stone structure, with its central portion separated from the two wings by fireproof compartments. The central building, 348 feet long and five stories high, furnishes assembly room, lecture rooms, museum, parlors, dining hall, and offices. The wings are four stories high. The ground floor of each wing is used for lecture and recitation rooms; the remaining floors contain the dormitories of the women students. The Dean of Women and several instructors and matrons reside in the building.

Wharton Hall, the dormitory for young men, is named in honor of its donor, Joseph Wharton, late President of the Board of Managers. The capacity of the hall is about two hundred. It stands in the west campus on the same ridge as Parrish Hall, and commands a view of the Delaware River valley.

Worth Hall, a dormitory for seventy young women students, is an attractive building of native stone, with mottled slate roofs, including six cottages, contiguous but distinctive in design. It is located on the east side of the campus, near Chester Road and College Avenue. The building and its equipment were the gift of the late William P. Worth, '76, and the late J. Sharpless Worth, ex-'73, as a memorial to their parents.

The *Science Hall* is a two-story stone building devoted chiefly to the departments of Physics, Biology and Education. It contains physical and biological laboratories. The east wing of this building includes a new biological laboratory named in honor of Professor Spencer Trotter, commemorating the thirtieth anniversary of the graduation of the class of 1890.

The *Hall of Chemistry* is a red brick building, two stories high, and contains a finished basement. The basement has an assay laboratory furnished with wind and muffle furnaces, a fire-

proof combustion room, a laboratory for gas analysis, a photometric dark room, large stock room, and cloak and toilet rooms. On the first floor are offices, and laboratories for quantitative analysis and for general chemistry. The large amphitheater lecture room, seating one hundred persons and extending to the basement, is reached from this floor. The second floor contains the organic laboratory, the laboratory for qualitative analysis, the laboratory for physical chemistry, the laboratory for electrolytic chemistry, and the library. Two balance rooms, one on the first floor and one on the second floor, contain balances mounted on columns built independently of the foundations and floors of the building. The laboratories are equipped with all the necessary modern apparatus. The chemical library contains scientific and technical books pertaining to chemistry, and complete sets of five of the leading chemical journals. Through the generosity of Mrs. Peter T. Berdan, the library has received a complete set of the publications of the London Chemical Society, and a set of the *Journal of the London Society of Chemical Industry,* presented by Mrs. Berdan as a memorial to her son, Frederick T. Berdan, a member of the Class of 1890.

The *Sproul Astronomical Observatory,* equipped by former Governor William Cameron Sproul, '91, contains nine rooms. On the first floor are an office, a departmental library, a computation room, two class rooms, and a shop room. On the second floor are a lecture room seating seventy-five persons, a dark room, and the dome room. The dome is a steel structure covered with copper, forty-five feet in diameter. It is revolved by an electric motor. Practically all the classes of the department of Mathematics and Astronomy, and some classes of other departments are held in the Observatory.

The chief instrument of the equipment is an equatorial refractor of twenty-four inches aperture, and thirty-six feet focal length, the mounting and optical parts of which were made by the John A. Brashear Co., Ltd. The mounting is modern and convenient, motors being provided for winding the clock and moving the telescope. The driving clock is electrically controlled. A disc driven by a sidereal clock situated on the north side of the pier reads right ascensions directly. The telescope

is provided with the usual oculars, helioscope, position micrometer, double-slide plateholder, and three ray filters.

There is also a photographic telescope of nine inches aperture and forty-five inches focal length, mounted after the design of the Bruce telescope at Yerkes Observatory. The instrument is provided with a heavy mounting, a heavy driving clock, coarse and fine position circles, a guide telescope, and such other accessories as make it an effective and convenient instrument. There are also two measuring engines for measuring five-by-seven photographic plates. One of these was built by Brashear, the other by Gaertner. There is also a blink microscope.

Stephen Loines has given to the observatory a Polar Equatorial a new type of telescope, designed and built by the Alvan Clark and Sons' Corporation. With this type of telescope the observer is enabled to make his observations while seated in a warm room. It is housed in the Sproul Observatory.

The *Students' Astronomical Observatory,* situated on the campus a short distance southeast of Parrish Hall, is especially equipped for the purposes of instruction. It contains a refracting telescope of six inches aperture, mounted equatorially, fitted with the usual accessories, including a position micrometer and a spectroscope. The observatory also contains a transit instrument of three inches aperture, a mean time and a sidereal clock and a chronograph. Mounted in a room adjoining the transit room is a Milne seismograph, presented by Joseph Wharton, which records photographically all vibrations of the crust of the earth. The latest addition to this observatory building contains the photographic telescope referred to above.

The *Library Building.* On the lower east campus, near the Benjamin West House, stands the Library, a fine specimen of the English Scholastic Gothic style. The Library was built and furnished through a gift to the College from Mr. Andrew Carnegie and is maintained from the income on a sum subscribed by several friends of the College. The building is constructed of local granite, with terra cotta and Indiana limestone trimmings and was erected under the supervision of Edward L. Tilton, of New York. In the second story of the entrance tower, is a large fireproof apartment, which contains the Friends'

Historical Library; in the third story, are placed the Westminster chimes of four bells and the Seth Thomas Clock presented to the College in June, 1910, by Morris L. Clothier, '90, in commemoration of the twentieth anniversary of the graduation of the Class of 1890. The first floor of the main building contains a stack room and a large reading room finished in dark oak. The reading room is two stories high, with a gallery round three sides. On this gallery open the seminar rooms, and the tower room devoted to the Friends' Historical Library; below are alcoves containing reference books and other books in common use.

Beardsley Hall is a three-story building of concrete block construction, with interior work all of reinforced concrete. It represents a modern type of factory building. The ground floor contains the forge and foundry, the second floor the machine shop and the third floor the woodworking department.

Hicks Hall, a three-story stone building, is the headquarters of the Division of Engineering. This building was erected in 1920 and was given by Frederick C. Hicks, Swarthmore, class of 1893, and dedicated to the memory of the Hicks family of Long Island, Isaac Hicks, Elias Hicks, Benjamin D. Hicks and Alice A. Hicks. The first floor is largely taken up by the mechanical laboratory, and contains, in addition, instrument rooms, research laboratory, class room, office and lavatory. The second floor contains the electrical laboratory, electrical research and instrument rooms, a small drawing room for junior and senior students, offices and class rooms. The third floor has a large drawing room for underclass work, an auditorium capable of seating 175 students, a library containing about 1500 volumes, a class room and offices.

The *Wm. J. Hall Gymnasium* for men is a two-story stone building. On the first floor are offices, examining room, and the main exercise hall, a room 50 by 80 feet, equipped with apparatus for individual and class work and a good court for basketball. A trophy room and running track are on the second floor. In the basement are lockers, shower baths, a dressing room for visiting teams, and handball courts.

Somerville Hall, erected in 1893 through the efforts of the

Somerville Literary Society, is used as a gymnasium for the women. It is furnished with apparatus adapted to the Swedish system of gymnastics. In the basement are dressing rooms, showers, and lockers for the use of day students who take work in the department of Physical Education.

There are two *Swimming Pools* in separate stone buildings, one for the women and another for the men. These pools were presented to the College by Philip M. Sharples. The building which contains the women's swimming pool is connected by a corridor with Somerville Hall, and the men's pool is connected in like manner with the William J. Hall Gymnasium.

The *Heating and Lighting Plant.* A central heat, light, and power plant is housed in a single-story brick structure, situated south of the Pennsylvania Railroad tracks.

Other buildings upon the campus are the *Meeting-house,* the *Benjamin West House* (birthplace of Benjamin West, P. R. A., erected in 1724), the *President's House,* the *Dean's House, Cunningham House* (the residence of the Professor of Astronomy and Mathematics), residences for members of the Faculty, a laundry building, a lodging house for the domestic servants, and farm buildings.

The Cloisters, a new development, is the group of lodges for the men's fraternities and the Wharton Club, now in course of erection on the west campus facing Wharton Hall. These buildings, of native stone, are to be connected by cloisters.

Swarthmore Field and *Alumni Field* provide facilities for outdoor athletics of the men. Swarthmore Field comprises the football and lacross grounds, and a quarter-mile cinder track with a two hundred and twenty yards straight-away. Alumni Field, contiguous with Swarthmore Field, provides a baseball ground and an auxiliary football field. The men's tennis courts are in front of Wharton Hall. The front campus affords additional playing fields for lacrosse, soccer and girls' hockey.

Cunningham Field, the women's athletic ground, includes a part of the east campus across Chester Road. This, and an area west of Worth Dormitory, furnish space for English field hockey, tennis and basketball. Cunningham Field was given by students, alumnæ, and friends of the College as a tribute to the late

Susan J. Cunningham, who was for many years Professor of Mathematics and Astronomy.

SOCIAL LIFE

Swarthmore, as a coeducational institution, undertakes to provide college life in a home setting; to supply an atmosphere in which manly and womanly character may develop naturally and completely. The intercourse of the students is under the care of the Dean of Women and her assistants, who aim to make it a means of social culture.

RELIGIOUS LIFE

The daily sessions of the College include a gathering of students and instructors for the reading of the Bible, or for some other suitable exercise, preceded and followed by a period of silence. Students under twenty-one years of age are expected to attend either Friends' Meeting, held every First-day morning in the Meeting House, or, at the request of their parents, the church in the borough of the religious denomination to which they belong. A class to which all students are invited is held at 10.00 on First-day mornings for the consideration of religious subjects.

STUDENTS' SOCIETIES

The *Cercle français* holds frequent meetings and is open to all students in the French Department after the middle of their first year. Its object is to afford increased opportunities for acquiring a practical knowledge of the French language.

The *Scientific Society* is an organization of the students and faculty interested in the newer scientific development. It meets on the first Tuesday of each month. The program consists of lectures and discussions, about one third of which are given by scientific men not connected with the College.

The *Classical Club* meets once a month during the College year. Addresses and papers are given on subjects which emphasize the broader aspect of classical culture and civilization.

The *English Club* meets once a month to hold discussions and

to listen to papers and addresses upon topics of literary and dramatic interest.

The *Somerville Forum* is an outgrowth of the Somerville Literary Society which was established in 1871. All women students are active members. There is one meeting a month, conducted by persons of prominence and authority, for the discussion of problems of vital interest to women. The final meeting in April known as Somerville Day, is a meeting of alumnæ and active members.

The *Engineers' Club* has for its purpose the reviewing of recent discoveries and achievements in engineering, discussing questions not raised in the class room, giving power in the presentation of topics, promoting intimacy between faculty and students, and providing guidance in the engineering vocations. Meetings are held once in each month in the Beardsley Hall Library. Students majoring in engineering are eligible for membership.

The *Polity Club* is an organization of students of the College who meet twice a month for the study and discussion of social and political problems.

The *Economics Club,* composed of students majoring in economics, has occasional meetings during the college year.

The *Athletic Association* is an organization of the men for the encouragement of physical training and athletic sports.

The *Women's Athletic Association* is a similar organization of the women students.

Musical Clubs. In addition to other activities, the musical interests of the students find expression in the musical clubs. The Girls' Glee Club gives a public concert each spring. The Swarthmore College Glee and Instrumental Clubs, composed of men, give several local concerts and also concerts in various cities under alumni auspices on tour during vacation periods.

Christian Associations. The religious life among the students is furthered by the Young Men's and Young Women's Christian Associations. Formal and informal receptions and other social functions are given with the object of promoting fellowship and a democratic spirit. Public meetings for worship are held every

Sunday evening, the young men meeting in Wharton Hall and the young women in Parrish Hall.

No student organization of the College may incur any financial obligation, or make any contract involving a monetary consideration, without first obtaining the sanction of the President of the College, or of the proper faculty committee under whose supervision the organization is placed. Students contemplating a new organization must first consult the President of the College. If he desires to grant them permission to effect such an organization, he will advise the student representatives of the particular faculty committee under whose supervision the organization is placed.

COLLEGE PUBLICATIONS

Two periodicals are published by the students under the supervision of the faculty: *The Phœnix,* a weekly publication, is devoted to undergraduate journalism; *The Portfolio,* a literary magazine of the undergraduates, is published quarterly; the *Halcyon* is published annually by the Junior Class.

The *Swarthmore College Bulletin* is published quarterly and contains a record of the matters of permanent importance in the progress of the College.

HONORARY SCHOLARSHIP SOCIETIES

The Swarthmore chapter of *Phi Beta Kappa,* the national society for the recognition of scholarship, was organized in 1896. Each year a certain number of students in the senior class, or the junior class, having the highest standing are elected to membership.

The Swarthmore chapter of *Sigma Tau,* the national society standing for scholastic attainment in engineering, was established in 1917. Members are chosen from among senior or junior students majoring in civil, or electrical, or mechanical engineering.

The Swarthmore chapter of *Sigma Xi,* the national scientific society for the promotion of research, was granted a charter in 1922. Students may become associate members after two and one-half years in college provided that, in the opinion of the

members of the society, they evidence promise of research ability, and may become members after they have produced a piece of research worthy of publication.

LIBRARIES AND READING ROOMS

The libraries of the College collectively contain about sixty thousand volumes.

The chief sources of income for increasing the collection in the college library are these: the Edgar Allen Brown Fund, the Alumni Fund, the General Library Fund, the Carnegie Library Fund, the George Taber Fund, the Clement M. Biddle Fund, the Elizabeth Powell Bond Fund, and the Friends' Historical Library Fund.

Residents of the borough of Swarthmore are free to use the library.

The Friends' Historical Library, founded by the late Anson Lapham, of Skaneateles, N. Y., contains a valuable and growing collection of Friends' books, tracts, and early writings (many very rare), photographs of representative Friends, other objects of personal and historic interest, and manuscripts relating to the Society and its history. This collection is carefully stored in the Library, and it is hoped that Friends and others will deem it a secure place in which to deposit books and other material in their possession which may be of interest in connection with the history of the Society. Such contributions are solicited, and should be addressed to the Friends' Historical Library, Swarthmore, Pa. The library is accessible to all persons interested in the doctrines and history of Friends, and ample arrangements are provided for its use for consultation and for reference.

Moreover, the great collections of books in the library of the University of Pennsylvania, the Philadelphia Library and its Ridgway Branch, the Mercantile Library, the Free Library of Philadelphia, as well as those in the special and technical libraries of the city, are open to the use of students under proper regulations. The Philadelphia library resources, which are of

especial utility in connection with the various departments of the College, are referred to in the departmental statements.

The Library and the departmental reading rooms are supplied with reference books and the leading literary, scientific, and technical journals.

The Library hours are 8.00 A. M. to 10.00 P. M. Monday to Friday and 8.00 A.M. to 5.00 P.M. on Saturday.

EXPENSES

The charge for tuition is $250 a year, payable in advance. No reduction of the tuition charge can be made on account of absence, illness, dismissal during the year, or for any other reason whatever, and no refunding will be made on account of any said causes.

The charge for board and residence is $450, of which at least half is payable in advance. The remainder is due on the first of January. Of this charge $280 is the charge for board; $170 is room-rent.

If any student for any reason whatsoever shall withdraw or be withdrawn from College, no portion of the payment for room-rent shall be refunded or remitted.

In case of illness and absence from the College extending over a continuous period of six weeks or more or withdrawal from the College for a continuous period of six weeks or more, there will be a special proportionate reduction in the charge for board provided that written notice be given to the Superintendent at the time of withdrawal, or, in case the student is ill at home, as soon as possible after the illness is proven. Oral notice will not be sufficient to secure this allowance.

Bills for the first payment are mailed before the opening of the College year and bills for the second payment are mailed before the first of January following. Payments shall be made by check or draft to the order of SWARTHMORE COLLEGE, SWARTHMORE, PA. Every student is responsible for prompt payment when due.

In case bills for the first semester are not paid by November 1st, and bills for the second semester by March 1st, students owing such bills may be excluded from all college exercises.

Students withdrawing or dismissed from College on or before the end of the first semester receive no benefit from scholarships, as scholarships are credited at the beginning of the second semester.

All students except upper class women choose rooms according to date of application for admission. After the Freshman

year women choose rooms by lot. In order to reserve a room in any one of the dormitories each student must make a deposit of $25 when the room is chosen. Of this amount $15 will be deducted from the first payment for board and room. The remainder will be held as a fund to cover breakage or any other damage to College property, and the loss involved if a student fails to occupy the room reserved for him. No part of the room deposit will be returned if the student fails to occupy the room. When the amount of a student's breakage exceeds $5, the unexpended balance is returned and a new deposit is required.

Special students who enroll for less than the prescribed number of hours will be charged according to the number of hours carried at the rate of $10 per credit hour.

DINING-ROOM RATES FOR MEMBERS OF THE FACULTY

The rates for the year 1925-26 are as follows: Per college year, $300; per month, $40; per week, $9.50; single breakfast, 30 cents; single lunch, 40 cents; single dinner, 75 cents; dinners per month, $22.50; lunches per month, $12; breakfasts per month, $8. The college year for instructors and administrative officers begins with the Saturday preceding Registration Day, and ends with the Saturday following Commencement Day, but does not include the Christmas vacation. Instructors and officers who wish meals before the beginning or after the end of the college year are expected to make arrangements in advance at the Superintendent's office.

COLLEGE CLOSED DURING CHRISTMAS RECESS

The College is closed during the Christmas recess. Students who desire to remain in Swarthmore or its vicinity at that time may secure board at moderate charge in homes recommended by the faculty. Students who desire to remain at the College during the spring recess will be charged a proportionate sum for board. Students leaving property in any college building during the summer recess do so at their own risk.

All Freshmen students will leave the College immediately

after their last examination is over in the spring in order that their rooms may be used by Commencement visitors.

Students purchase their own books, stationery and drawing instruments, which may be obtained at the College Bookstore at low rates. A reasonable rate is charged for laundry work done at the College.

A fee of $10 a semester is charged in every laboratory science, except in Chemistry.

The fees in the department of Chemistry and Chemical Engineering are as follows: For the course in Assaying, no fee, but students pay for all breakage and all materials used; for the course in Mineralogy $3 a semester; for all other courses in this department $15 a semester. In addition to the above-named fees every student graduating in the department of Chemistry and Chemical Engineering is charged $25 in lieu of fees for apparatus and materials used, in connection with his thesis. This last named fee is payable at the beginning of the second semester of the Senior year.

A fee of $10 for each semester will be charged for each course in surveying, mechanical laboratory, electrical laboratory or illumination.

Students are charged a fee of $1 a semester for the use of gymnasium and swimming pools. This amount includes locker rental.

The expenses of a student at Swarthmore, beyond the payments made directly to the College, vary according to the individual. Budgets reported by present students show that total expenditures for tuition, board, books, clothing, and recreation range from $850 to $1,000 for the academic year.

INFIRMARY REGULATIONS

1. Students suffering from any of the communicable diseases (contagious or infectious) must reside in the infirmaries for the period of their illness.

2. Students suffering from illness which makes it necessary for them to remain in bed must reside in the infirmaries for the period of their illness. It is the duty of the College to protect as far as possible the health of students, this applying to those who are in good health as well as those who are ill.

3. FEES.—A fee of $1.50 per day shall be paid by those occupying the infirmaries. A fee of twenty-five cents shall be charged to those not occupying the infirmaries for each meal served them.

4. ABSENCE FROM CLASSES.—*When illness demands absence from classes the student in question should report at once his or her case to the nurses or resident physician. Excuses will not be granted to those failing to comply with this rule.*

5. Students shall have the opportunity to select their own physician. The resident physician, E. LeRoy Mercer, M.D., in charge of both infirmaries, is available by appointment for examination or advice on matters of health. No charge is made for this service.

FELLOWSHIPS AND SCHOLARSHIPS

FELLOWSHIPS

The JOSHUA LIPPINCOTT FELLOWSHIP of $650, founded by HOWARD W. LIPPINCOTT, A.B., of the Class of 1875, in memory of his father, is awarded annually by the faculty, with the concurrence of the Instruction Committee, to a graduate of the College of at least one year's standing for the pursuit of graduate study under the direction of the faculty or with their approval. Applications for the Joshua Lippincott Fellowship for the year 1926-27 must be received by the Faculty before February 20, 1926.

The LUCRETIA MOTT FELLOWSHIP, founded by the Somerville Literary Society and sustained by the contributions of its life members, has yielded an annual income since its foundation of $525. It is awarded each year by a committee of the faculty (selected by the society), with the concurrence of the life members of the society, to a young woman graduate of that year who is to pursue advanced study at some other institution approved by this committee.

The JOHN LOCKWOOD MEMORIAL FELLOWSHIP of $650 was founded by the bequest of Lydia A. Lockwood, of New York, in memory of her brother, John Lockwood. It was the wish of the donor that the fellowship be awarded to a member of the Society of Friends. It is to be awarded annually by the faculty, with the consent of the Instruction Committee, to a graduate of the College of at least one year's standing, for the pursuit of graduate studies under the direction of the faculty or with their approval. Applications for this fellowship for 1926-27 must be received by the faculty by February 20, 1926.

The HANNAH A. LEEDOM FELLOWSHIP of $400 was founded by the bequest of Hannah A. Leedom. It is awarded annually by the faculty, with the consent of the Instruction Committee, to a graduate of the College of at least one year's standing for the pursuit of graduate studies under the direction of

the faculty or with their approval. Applications for this fellowship for 1926-27 must be received by the faculty by February 20, 1926.

The MARTHA E. TYSON FELLOWSHIP of $450, founded by the Somerville Literary Society in 1913, is sustained by the contributions of life members of the society. It is awarded annually by a joint committee of the faculty and the society (elected by the society) with the concurrence of the life members of the society to a woman graduate of Swarthmore College, who has taught successfully for two years after her graduation, and expects to continue teaching. The recipient of the award is to pursue a course of study fitting her for more efficient work in an institution approved by the Committee of Award. Applications for this fellowship for 1926-27 must be received by the Committee of Award not later than February 1, 1926.

SCHOLARSHIPS

1. The WESTBURY QUARTERLY MEETING, N. Y., SCHOLARSHIP is awarded annually by a committee of that Quarterly Meeting.

2. Each of the following funds yields annually about $200 and is awarded at the discretion of the College to students needing pecuniary aid, whose previous work has demonstrated their earnestness and ability:

(*a*) The REBECCA M. ATKINSON SCHOLARSHIP FUND.
(*b*) The BARCLAY G. ATKINSON SCHOLARSHIP FUND.
(*c*) The THOMAS L. LEEDOM SCHOLARSHIP FUND.
(*d*) The MARK E. REEVES SCHOLARSHIP FUND.
(*e*) The THOMAS WOODNUTT SCHOLARSHIP FUND.
(*f*) The SARAH E. LIPPINCOTT SCHOLARSHIP FUND.

3. The ANNIE SHOEMAKER SCHOLARSHIP, a free scholarship for board and tuition, is awarded annually to a young woman graduate of Friends' Central School, Philadelphia.

4. The HARRIET W. PAISTE FUND is limited by the following words from the donor's will: "the interest to be applied annually to the education of female members of our Society of

Friends (holding their Yearly Meeting at Fifteenth and Race Streets, Philadelphia) whose limited means would exclude them from enjoying the advantages of an education at the College."

5. The MARY WOOD FUND is limited by the following words from the donor's will: "the income thereof to be, by the proper officers thereof, applied to the maintenance and education at said college of one female student therein, one preparing for the avocation of a teacher to be preferred as the beneficiary, but in all other respects the application of the income of said Fund to be in the absolute discretion of the college."

6. The WILLIAM C. SPROUL SCHOLARSHIP. William C. Sproul, a graduate of the Class of 1891, offers annually a scholarship to a graduate of the Chester High School. This scholarship may continue throughout the college course. Details may be secured from the principal of the Chester High School.

7. The following scholarships are offered for work done in the College in 1924-25. They are of the value of $200 each of resident, and $100 each for day students, and are awarded in each instance to that member of each of the respective classes who shall be promoted without conditions, and shall have the best record of scholarship upon the regular work of the year:

(*a*) The DEBORAH FISHER WHARTON SCHOLARSHIP will be awarded to a member of the Junior Class.

(*b*) The SAMUEL J. UNDERHILL SCHOLARSHIP will be awarded to a member of the Sophomore Class.

(*c*) The ANSON LAPHAM SCHOLARSHIP will be awarded to a member of the Freshman Class.

8. The SAMUEL WILLETS FUND provides several scholarships for resident students needing pecuniary aid, whose previous work has demonstrated their earnestness and ability. They will be awarded at the discretion of the Committee on Trusts. Application should be made to the President of the College.

9. The ISAAC STEPHENS SCHOLARSHIPS. Four scholarships of $50 per year.

10. The I. V. Williamson Scholarship for Preparatory Schools. Ten scholarships of the value of $150 each for resident students, and $75 each for day students, are offered to members of classes graduating in 1924 in the following schools:

1 to Friends' Central School (Boys' Department) ..... Philadelphia.
1 to Friends' Central School (Girls' Department) ..... Philadelphia.
1 to Friends' Seminary ..... New York, N. Y.
1 to Friends' School ..... Baltimore, Md.
1 to Friends' School ..... Wilmington, Del.
1 to Friends' High School ..... Moorestown, N. J.
1 to Friends' Academy ..... Locust Valley, N. Y.
1 to Friends' Select School ..... Washington, D. C.
1 to Brooklyn Friends' School..... Brooklyn, N. Y.
1 to George School (Boys' Department) .... George School, Pa.
1 to George School (Girls' Department) .... George School, Pa.

These scholarships are awarded under the following conditions:

(*a*) There must be two or more candidates from each school for the scholarship.

(*b*) The candidates will be required to take the examinations of the College Entrance Examination Board. The scholarship will be awarded only to that candidate who makes a passing grade of 60 per cent in each subject required for admission and who makes the highest average grade.

(*c*) Examinations must be completed before July 1 preceding the year of admission to College. A candidate may take any examination for which his preparation is complete in any year of the college preparatory course.

(*d*) No scholarship will be awarded to applicants who fail to be admitted without conditions.

(*e*) Every holder of such scholarship must pursue in College the studies leading regularly to the degree of Bachelor of Arts.

(*f*) The College reserves the right to require some form of service from students receiving scholarships from the College.

11. For the year 1924-25, Swarthmore College offers three scholarships of $150 each for resident students and $75 each for day students, to members of classes graduating in 1924 in the following schools:

1 to Swarthmore Preparatory School .....Swarthmore, Pa.
1 to Swarthmore Public High School.....Swarthmore, Pa.
1 to The West Chester High School.....West Chester, Pa.

These scholarships will be awarded under the same conditions as the I. V. Williamson scholarships described under Caption 10.

12. The Phœbe Anne Thorne Fund provides several scholarships for students needing pecuniary assistance whose previous work has demonstrated their earnestness and their ability. This gift includes a clause of preference to those students who are members of the New York Monthly Meeting of Friends. These scholarships are awarded by the College under the regulations fixed by the Board. Application should be made to the President of the College.

13. The Western Swarthmore Club offers every four years in conjunction with the College one competitive scholarship of $700 for each of the four years. The scholarship is open for competition to all high and preparatory school graduates west of the Allegheny Mountains. Students interested are requested to apply to the President of the Club.

14. The Mary Coates Preston Scholarship Fund. A sum of money has been left by will of Elizabeth Coates to Josephine Beistle, of Swarthmore, as trustee, the annual interest of which will be about $300. This amount is given by the trustee as a scholarship to a young woman student in Swarthmore College, preferably to a relative of the donor.

15. The Woman's Medical College of Pennsylvania offers a scholarship of $175, full tuition, to a young woman graduate of Swarthmore College. This amount is to be given annually during the four years of medical work, thus having a total value of $700 to the student receiving the scholarship.

16. The Ivy Medal is placed in the hands of the faculty by a friend of the College, to be awarded on Commencement Day to

a male member of the graduating class. The regulations governing the award are as follows:

(1) The idea behind the Ivy Medal is in general the Rhodes Scholarship qualifications, including (*a*) qualities of manhood, force of character, and leadership; (*b*) literary and scholastic ability and attainments. This has been phrased by the donor in the words "leadership based upon character and scholarship."

(2) It is the wish of the donor that the medal should not be awarded on a mere basis of averages. Instead, it is desired that the winner should be a man who gives promise of distinction either in character or in intellectual attainments, as opposed to a man who has merely made the most of mediocre abilities.

(3) On the other hand, it is the wish of the donor that the medal should not go to a man who, while showing excellence in some one respect, has fallen seriously below the standard in others.

17. The Oak Leaf Medal is placed in the hands of the faculty by a friend of the College, to be awarded on Commencement Day to a young woman member of the graduating class for loyalty, scholarship, and service.

18. The JONATHAN K. TAYLOR SCHOLARSHIP, in accordance with the donor's will, is awarded by the Board of Trustees of the Baltimore Monthly Meeting of Friends. This scholarship is first open to descendants of the late Jonathan K. Taylor. Then, while preference is to be given to members of the Baltimore Yearly Meeting of Friends, it is not to be confined to them when suitable persons in membership cannot be found.

19. The T. H. DUDLEY PERKINS MEMORIAL SCHOLARSHIP provides for the board and tuition of one young man. It is given for the academic year 1924-25 to the best young man candidate as judged by a committee of the faculty appointed by the President of the College for the purpose. The award will be made and the following points determined by the credentials of the secondary school from which the successful candidate is a graduate.

First. Qualities of manhood, force of character and leadership, 50 points.

Second. Literary and scholastic ability and attainments, 30 points.

Third. Physical vigor as shown by participation in out-of-door sports or in other ways, 20 points.

These requirements are similar to the conditions of the Rhodes Scholarship. This scholarship is founded in honor of T. H. Dudley Perkins, Swarthmore, 1906, who died in the service of his country on Tenth Month 20th, 1918. The qualifications required of the holder of this scholarship are such as Dudley Perkins possessed in a marked degree. The donors of this scholarship are his wife, Alice Sullivan Perkins, '04; his sister, Marion Perkins Jessup, '94; and his brother, E. Russell Perkins, '11.

20. The SARAH KAIGHN COOPER SCHOLARSHIP, founded by Sallie K. Johnson in memory of her grandparents, Sarah Kaighn and Sarah Cooper, is awarded by the faculty to the member of the Junior Class who shall have, since entering College, the best record for scholarship, character, and influence. The value of this scholarship for the year 1924-25 is $250.

21. The DUPONT SCHOLARSHIP. The E. I. duPont de Nemours & Company, of Wilmington, Del., offers two annual scholarships of $350 for the purpose of encouraging advanced students to continue the study of chemistry. The scholarships are to be granted to Senior or graduate students who make chemistry or chemical engineering their major subject.

22. SWARTHMORE COLLEGE OPEN SCHOLARSHIPS. Swarthmore College in 1922 established experimentally five annual open competitive scholarships for men, not confined to any particular school, locality, subject of study, or religious denomination. These scholarships are based upon the general plan of the Rhodes Scholarships and are given to candidates who show greatest promise in:

(1) Qualities of manhood, force of character and leadership.
(2) Literary and scholastic ability and attainments.
(3) Physical vigor, as shown by interest in outdoor sports or in other ways.

The regulations under which these scholarships will be awarded in 1925 are as follows:

The stipend of a Swarthmore College Open Scholarship will be five hundred dollars ($500) a year, which will cover the greater part of a man's college expenses.

Each scholarship is tenable for four consecutive years, subject to the maintenance of a high standing in the college.

A candidate to be eligible must:

(*a*) Be between the ages of 16 and 21 on September 1st of the year for which he is elected.

(*b*) Be qualified to enter Swarthmore College on certificate with fifteen units of credit as prescribed in the college catalogue.

(*c*) Not have attended another college or university.

Each candidate must secure the endorsement of the principal of his preparatory school and not more than two candidates may be selected to represent a particular school in the competition for any one year.

Scholars will be selected without written examination on the basis (1) of their school record as shown by the material called for in the application blank and (2) of a personal interview with some representative of the college. It is expected that these interviews can be arranged in practically any part of the United States so as to make it unnecessary for candidates to travel any considerable distance. Application blanks duly filled out and accompanied by the material specified must reach the Dean of Swarthmore College on or before April 16, 1924. References will be followed up, interviews arranged in various parts of the country, and the awards announced about June 15.

The winners for 1924-25 are (in alphabetical order): John W. Dutton, of George School, Bucks County, Pa.; Roy J. Kersey, of Palmyra, New Jersey, High School; Holbrook M. MacNeille, of Summit, New Jersey, High School; Thoburn Maxwell, of Technical High School, Indianapolis, Ind.; John C. Willever, of Summit, New Jersey, High School.

The alternates in order of rating are: Malcolm B. Petrikin, of Chester, Pa., High School; Merl R. Barnes, of Albany Academy, Albany, New York; S. A. Higginbottom, of Wilbraham Academy, Wilbraham, Mass.; M. N. Morrison, of Abington Township High School, Abington, Pa.; Joseph E. Bell, of Northeast High School, Philadelphia, Pa.

There were one hundred and thirty-one candidates from twenty-two states. Interviews with the leading candidates were conducted in various parts of the country by representatives of the Committee of Selection, including Swarthmore Alumni and former Rhodes Scholars. The Committee of Selection comprised President Aydelotte, Dean Raymond Walters, Dr. Robert C. Brooks and Dr. E. L. Mercer of the Swarthmore Faculty, Howard Cooper Johnson of the Swarthmore Board of Managers, Professor Joseph H. Willits of the University of Pennsylvania, and Carroll A. Wilson, of New York, an ex-Rhodes Scholar.

23. The JAMES E. MILLER SCHOLARSHIP. Under the will of Arabella M. Miller, the sum of $5,986 was awarded to the Cambridge Trust Company, Trustee under the will of James E. Miller, to be applied to scholarships in Swarthmore College. An annual income of approximately $340 is available and may be applied toward the payment of board and tuition of students of Delaware County (preference to be given to residents of Nether Providence Township) to be selected by Swarthmore College and approved by the Trustee.

ADMISSION

The subjects required for entrance to Swarthmore College are as follows:

Elementary Algebra	1½	units
Plane Geometry	1	unit
English	3	units
Foreign Language	2	units
History	1	unit

Required subjects, *eight and one half* units.

Advanced Algebra	½	unit
*Solid Geometry	½	unit
*Plane Trigonometry	½	unit
Latin	2, 3 or 4	units
Greek	2, 3 or 4	units
French	2, 3 or 4	units
German	2, 3 or 4	units
Spanish	2, 3 or 4	units
Ancient History	1	unit
Medieval and Modern History	1	unit
Modern History	1	unit
English History	1	unit
American History	1	unit
Civil Government	½	unit
Physics	1	unit
Chemistry	1	unit
Botany	½ or 1	unit
Zoölogy	½ or 1	unit
Physical Geography	½ or 1	unit
Freehand Drawing	½ or 1	unit
Mechanical Drawing	½ or 1	unit
Satisfactory Free Electives	3	units

Optional subjects, *six and one half* units.

* Required for admission for engineering students.

These requirements may be met

(1) By passing examinations of the College Entrance Examination Board or

(2) By satisfactory certificates from accredited schools.

The basis for admission is the twofold one of scholarship and personal qualities. The procedure for determining these is

(1) To inspect the examination record or the school record of the applicant to ascertain scholastic qualifications and

(2) To interview the applicant and consider recommendations of persons acquainted with the applicant to judge as to personal qualities.

Examinations, June 15-20, 1925

College Entrance Examination Board

The application for examination should be addressed to the College Entrance Examination Board, 431 West 117th Street, New York, N. Y. It should be made upon a blank form to be obtained from the Secretary of the College Entrance Examination Board.

If the application be received sufficiently early the examination fee will be $9.00 for candidates examined in the United States and Canada and $20.00 for candidates examined elsewhere. The fee, which should accompany the application, should be remitted by postal order, express order, or draft on New York to the order of the College Entrance Examination Board.

Applications and fees of candidates who wish to be examined outside of the United States and Canada should reach the Secretary of the Board at least six weeks in advance of the first day of the examinations, that is, on or before May 4, 1925.

Applications and fees of candidates who wish to be examined in the United States at points west of the Mississippi River or in Canada should be received at least four weeks in advance of the first day of the examinations, that is, on or before May 18, 1925.

Applications and fees of candidates who wish to be examined in the United States at points east of the Mississippi River or on the Mississippi River should be received at least three weeks

in advance of the first day of the examinations, that is, on or before Monday, May 25, 1925.

When the candidate has failed to obtain the required blank form of application for examination the usual examination fee will be accepted if the fee arrives not later than the specified date accompanied by a memorandum containing the name and address of the candidate, the exact examination center selected, and a list of all the subjects in which he expects to take the Board examinations.

Applications received later than the dates named will be accepted when it is possible to arrange for the examination of the candidates concerned, but only upon the payment of an additional fee.

A list of the places at which examinations are to be held in June, 1925 will be published about March 1. Requests that the examinations be held at particular points, to receive proper consideration, should be transmitted to the Secretary of the College Entrance Examination Board not later than February 1. The designation of the center to which the candidate will go for examination is regarded as an indispensable part of the candidate's application for examination.

Detailed definitions of the requirements in all examination subjects are given in a circular of information published annually by the College Entrance Examination Board. The edition published December 1, 1923 was designated as Document 111. A new edition which will be designated as Document No. 114 will appear December 1, 1924. Upon request a single copy of this document will be sent to any teacher without charge. In general a charge of twenty cents, which may be remitted in postage, will be made.

Admission by Certificate. Graduates of Friends' Schools and of high schools and preparatory schools approved by the faculty and Instruction Committee may be admitted to the College on certificate of the principal. The faculty admits these students *on trial,* and reserves the right to change their classification or to decline to continue their connection with the College if they find them to be insufficiently prepared. The privilege of

certificating students may be withdrawn from any school whose pupils are found to be deficient.

Certificates issued by the College Entrance Examination Board will be accepted in place of examinations on the subjects therein certified to as passed. See page 38 for information as to the examination held by this Board. Additional information, if needed, may be obtained by addressing The Secretary of the College Entrance Examination Board, 431 West 117th Street, New York, N. Y.

Graduation from an acceptable four years' high school course or its equivalent is required for admission to the Freshman class on certificate.

DEFINITION OF ENTRANCE REQUIREMENTS

It is to be carefully noted that the subjects included among the entrance requirements are rated as strictly as possible according to the *time* that should have been devoted to preparatory work in each.

In regard to a *unit* of admission requirements, the faculty of Swarthmore College has approved the following statement, which has been adopted by the National Conference Committee on Standards of Colleges and Secondary Schools, the College Entrance Examination Board, and the Carnegie Foundation for the Advancement of Teaching:

A unit represents a year's study in any subject in a secondary school, constituting approximately a quarter of a full year's work.

This statement is designed to afford a standard of measurement for the work done in secondary schools. It takes the four-year high school course as a basis, and assumes that the length of the school year is from thirty-six to forty weeks, that a period is from forty to sixty minutes in length, and that the study is pursued for four or five periods a week. By this standard a satisfactory year's work in any subject cannot be accomplished under ordinary circumstances in less than one hundred and twenty sixty-minute hours or their equivalent. Schools or-

ganized on any other than a four-year basis can, nevertheless, estimate their work in terms of this unit.

The total number of units required on this basis for admission to Swarthmore College is *fifteen.*

In accordance with a resolution adopted in 1908 by the Modern Language Association of America and a similar one adopted in 1914 by the Association of Modern Language Teachers of the Middle States and Maryland, it is recommended that the schools preparing students for Swarthmore College prescribe adequate aural and oral tests for all candidates who desire to present a foreign modern language in satisfaction of requirements for admission.

Detailed definitions of the requirements in all subjects listed under the general statement on page 37, including lists of experiments in the natural sciences are given in a special circular of information published annually by the College Entrance Examination Board. The edition published December 1, 1924, was designated as Document No. 114. Copies of this document may be obtained from the Secretary of the Board, 431 West 117th Street, New York, N. Y. Upon request to the Board a single copy will be sent to any teacher without charge. In general a charge of twenty cents, which may be remitted in postage stamps, will be made.

LIMITATION OF ENROLLMENT

The size of the Freshman class each year is determined by the resolution of the Board of Managers which limits the total enrollment of the College to 500 students, 250 men and 250 women. From the applicants for admission in any year who meet fully the entrance requirements of the College, the members of the Freshman class are chosen in the order of merit. In the determination of scholarship, breadth of reading and interest in intellectual matters are considered as well as school grades. As to character, the qualities sought are the simplicity, moral earnestness and idealism which have been traditionally associated with the Society of Friends and with Swarthmore College.

Preference is given to candidates who are children of Friends and of Alumni of the College provided their school records meet in all respects th standards set by the College for admission. When the merits of two candidates are approximately equal, it is considered fair that preference should be given to the earlier application.

Candidates for admission should make early application. Record of their school work for the first three years, signed by the school Principal should be submitted one year prior to admission. Application blanks and certificate blanks are furnished by the Dean of the College upon request. Certificates are returned to the school Principals in the spring for the record of the Senior year.

Applicants whose school records are good are invited to call at Swarthmore College at suitable times during the fall and winter for interviews. Persons living too far from Swarthmore to make this possible are interviewed by representatives of the College in any part of the United States.

The names of the women applicants accepted for admission are announced as soon as possible after February 1, and the names of the men applicants as soon as possible after May 1, of the year of admission.

ADVANCED STANDING

For favorable consideration, applicants for advanced standing must have had a high scholastic record in the institution from which they desire to transfer, and must present full credentials for both college and preparatory work and a letter of honorable dismissal. In general, students are not admitted to advanced standing later than the beginning of the Junior year.

REQUIREMENTS FOR GRADUATION

THE GENERAL UNDERGRADUATE COURSE OF STUDY

The degree of Bachelor of Arts is conferred upon those who complete the undergraduate course as outlined below. This course is based upon uniform requirements for admission, and upon certain studies which are prescribed for all matriculates. In addition to securing this fundamental uniformity, it provides for the varied needs and capacities of individuals by permitting a wide range of election on the part of the student or his adviser; and it seeks, also, to provide a thorough training, extending over three or four years, in some one department of study. The requirement of a thesis from a candidate for the Bachelor's degree is left to the option of the head of the department in which the major is taken.

Candidates for graduation in the Department of Liberal Arts are required to complete one hundred and twenty-four "hours" in addition to the prescribed work in physical education. For the number of hours required for graduation in the Departments of Engineering and in the Department of Chemistry, see the courses of study outlined under the various departments. *The foregoing are minimum requirements. Students may be required to complete additional "hours" for graduation as penalties for absences from collection or from class room, laboratory, or other college exercises.* An "hour" signifies one recitation or lecture (or its equivalent) a week throughout one college semester. A recitation or lecture is regularly fifty-five minutes long, and the preparation of the student is estimated at an average of two hours for each class exercise. In the Departments of Engineering, Biology, and Chemistry a laboratory period is three hours in length. In other departments, where additional work is required outside of the laboratory, the laboratory period is two hours in length. It is designed to make the laboratory exercise, as nearly as possible, equivalent in its demands to the hours defined above.

The prescribed number of hours for students majoring in

the Departments of Liberal Arts is seventeen for each semester of the freshman year and fifteen for each semester of the sophomore, junior, and senior years. The prescribed number of hours for students majoring in Engineering ranges from fifteen to twenty for each semester.

Quality Points.—An average quality grade shall be required for graduation, and for the purpose of determining this quality grade, numerical values called "points," shall be given to the grade letters, as follows: for grade A, three points for each semester hour of course in which the grade is received; for grade B, two points; for grade C, one point; for grade D, no point. The grade D is sufficient to pass a course, but does not count any point.

In accordance with this valuation the requirements in "points" for graduation of all students, both those in Arts and in Applied Science, is one hundred and twenty-four. This is a requirement for Arts students of an average grade of C. In other words, Arts students are required for graduation to present one hundred and twenty-four hours of credit and one hundred and twenty-four points. Students in Applied Science will be required for graduation to present the number of hours of credit now prescribed (ranging from one hundred and thirty-two to one hundred and forty-eight) and one hundred and twenty-four points.

Extra or Less Hours.—Students are not allowed to carry more nor less than the prescribed amount of work except in special cases approved by the Committee on Prescribed and Extra Work. Students often find it difficult, however, to make out a course of study for the exact number of hours, and for this reason a variation of one hour more or less than the prescribed number of hours may be allowed by the course adviser. In such cases the endorsement of the course adviser must be secured in writing on the Enrollment Card.

Students desiring to carry more than one hour in excess of the prescribed number, or more than one hour below the prescribed number, must make application to the Committee on Prescribed and Extra Work on a regular form provided for the purpose by the Dean. No student whose marks have fallen be-

low C in any subject or below B in more than one department during the preceding semester shall be permitted to enroll for more than one hour in excess of the prescribed number. For students entering from other schools or colleges these grades shall be determined from their entrance certificates. No application of a student to enroll for more or less than the perscribed number of hours shall be considered by the committee unless accompanied by the written endorsement of the course adviser.

I. *Prescribed Studies.*—These studies must be taken by all students who are candidates for graduation, unless for special reasons permission to substitute some other work is obtained from the proper faculty committee. The whole of the first year is devoted to five of the prescribed studies with one elective.

The time and order in which the remaining studies are taken may vary according to the requirements of each department. The prescribed work, amounting to forty-three hours, exclusive of the Physical Education, includes the following studies:

Group 1. English.—Ten hours, four of which must be taken in English Composition, and six in English Literature.

Group 2. Greek, Latin, French, German, Spanish.—Twelve hours in any one of these languages, or six hours in each of two. If a language is begun in College it must be pursued for two years.

Group 3. Twelve* hours, in the following departments: History, History of Religion and Philosophy, Economics, Political Science, Education, and the Fine Arts.

Group 4. Biology, Chemistry, Physics.—Six hours, to be taken in any one of the three departments, and to include at least one credit-hour of laboratory work throughout a year.

Group 5. Mathematics, Astronomy.—Six hours, to be taken in either one of the two studies.

Group 6. Physical Education.—For the prescribed amount of work in this department, see the statements under the Department of Physical Education.

Students who fail in the required courses of the freshman year shall enroll in these courses during the sophomore year.

* Students in the Departments of the applied sciences are required to take nine hours in the Departments mentioned.

No deviation from this rule will be allowed except on the written endorsement of the course adviser, and after notification to the professor in charge of the subject in which the student failed.

All prescribed studies must be completed or in actual process of completion at the beginning of the senior year except in cases where such prescribed work is not offered until the second semester of the senior year.

No substitution of elective for prescribed work where more than one semester is involved shall be permitted after the beginning of the senior year, nor in any case after the beginning of the second semester of the senior year.

Application for permission to substitute an elective for a prescribed study must be made to the Committee on Prescribed and Extra Work on a regular form provided by the Dean for the purpose.

Students in engineering and applied science will take an examination in Plane Trigonometry before entering upon the study of Analytic Geometry. Those who do not show a sufficient knowledge of the subject in this examination will take a course in Plane Trigonometry in College as an extra study not to be counted for credit toward graduation.

II. *Major Subject.*—Every candidate for graduation is required to select the work of some one department as his major. In most cases the selection may well be postponed until the beginning of the second year. In the department thus chosen the student must complete eighteen hours as a minimum (the prescribed work done in the major study to be included in this minimum), and the professor in charge may, at his option, determine the work of thirty-six hours, provided six hours shall not be in his own department. If the major study is one of the languages, at least six hours of the prescribed work must be taken in another language. No matter how much credit may have been given on entrance, no student is allowed to graduate who has not been enrolled as a student of Swarthmore College at least one year and who has not had in the College at least one year's work in his major.

If the major study is changed from any branch of Engineering to a department in Arts, the number of credit hours then on record will be adjusted to the basis of 124 hours.

III. *Elective Studies.*—The remaining work required for graduation may be elected from any department or departments of the College.

The following subjects are open to election, in so far as the exigencies of the college programme will permit:

Anthropology,	Engineering,	Law,
Art,	English,	Mathematics,
Astronomy,	French,	Philosophy,
Bible Study,	Geology,	Physics,
Biology,	German,	Political Science,
Botany,	Greek,	Psychology,
Chemistry,	History,	Public Speaking,
Economics,	History of Religion,	Spanish,
Education,	Latin,	Zoölogy.

HONORS COURSES

Students who are capable of doing more independent work than that required to fulfill the ordinary requirements for the A.B. degree are allowed to volunteer at the end of the Sophomore year to read for the A.B. degree with honors.* Admission to

*The theory underlying this honors work was outlined by President Aydelotte in his inaugural address at Swarthmore College on October 22, 1921, in the following words:

"Perhaps the most fundamentally wasteful feature of our educational institutions is the lack of a higher standard of intellectual attainment. We are educating more students up to a fair average than any country in the world, but we are wastefully allowing the capacity of the average to prevent us from bringing the best up to the standards they could reach. Our most important task at the present is to check this waste.

"The method of doing it seems clear: to give to those students who are really interested in the intellectual life harder and more independent work than could profitably be given to those whose devotion to matters of the intellect is less keen, to demand of the former in the course of their four years' work, a standard of attainment for the A.B. degree distinctly higher than we require of them at present and comparable, perhaps, with that which is now reached for the A.M.

"I do not believe that we should deny to the average, or below average, student the benefit of a college education. He needs this training, and we need his humanizing presence in the colleges, but we should not allow him to hold back his more brilliant companions from doing that high quality of work which will in the end best justify the time and money which we spend in education.

"With these abler students it would be possible to do things which we dare not attempt with the average. We could allow them to specialize more because their own alertness of mind would of itself be sufficient to widen their intellectual range and give them that acquaintance with other studies necessary for a liberal point of view.

"We could give these better students greater independence in their work, avoiding the spoon-feeding which makes much of our college instruction of the present day of secondary school character. Our examinations should be less frequent and more comprehensive, and the task of the student should be to prepare himself for these tests through his own reading and through the instruction offered by the college."

the status of an honors student depends upon the quality of the applicant's work in the first two years. In the consideration of this record, special aptitude is regarded as of more importance than a mere high average of grades all round. Honors students are excused from the ordinary examinations and course requirements. Instead, they are expected to spend two years in mastering a certain definitely outlined field of knowledge over which they are examined at the end of their two years' work. Their instruction is mainly individual, and a large part of their work is done independently by their own reading. It is open to Honors students to attend as many or as few of the regular classes of the College as they desire, though they are guided in this respect by the advice of the Chairman of the division in which they are reading. The comprehensive examinations at the end of their course consist of from ten to twelve three-hour papers followed by an oral examination. These tests are conducted not by the persons who have had charge of the preparation of the candidates but by professors from other institutions. On the basis of these examinations, Honors students are given the degree of Bachelor of Arts with Honors of the first or second or third class as their merits may deserve. Candidates whose work is not of a high enough quality to entitle them to any of these classes may be given the ordinary A.B. degree without Honors.

Honors work is carefully organized but not so narrowly specialized as to fall in any case within the limits of a single department. Instead, each honors course is given by a group of departments combined into a division. The divisions in which honors work is now being offered, together with the requirements in each, are as follows:

DIVISION OF ENGLISH LITERATURE

The Honors course in the Division of English Literature is conducted jointly by the Departments of English, History, and Philosophy. The Committee in charge consists of Dr. Goddard, English, *Chairman;* Dr. Hull, History; Dr. Holmes, Philosophy; and President Aydelotte and Dean Walters, English.

The field covered by the course is the history of English thought

from the Fourteenth Century to the Nineteenth, with its necessary background of social and political history. The main part of the work is comprised in the study of six topics outlined below. Honors students are left to prepare for themselves those portions of English History and Literature not covered by the special topics.

I. English Literature of the periods of Chaucer, Shakespeare, and Milton.

II. The Social and Political History of England from the Black Death to the Restoration of Charles II.

III. The Transition in England from Mediæval to Modern Thought during the Renaissance and the Reformation.

IV. English Literature from the French Revolution to the End of the Nineteenth Century.

V. History of England from the French Revolution to the end of the Nineteenth Century.

VI. Philosophy and Science in the Eighteenth and Nineteenth Centuries.

The set books required of all students are announced in a list published two years in advance and may be changed after each two-year period.

DIVISION OF THE SOCIAL SCIENCES

The Honors course in the Division of the Social Sciences is conducted jointly by the Department of Political Science, Economics, History, Education, Anthropology, and Philosophy. The Committee in charge consists of Dr. R. C. Brooks, Political Science, *Chairman;* Dr. Urdahl, Economics; Dr. Hull, History; Dr. Ryan, Education; Dr. Trotter, Anthropology; Dr. Mercer, Public Health, and Dr. Holmes, Philosophy.

The course covers prescribed books in political philosophy, in philosophy and ethics, in anthropology, and in economic history and economic theory. The general topics considered by the group include history of political ideas; political institutions of the United States and Great Britain; historical and economic aspects of American history; money and currency; industrial development and industrial conditions; population and labor; and a

study of the leading economic forces that have shaped the political and social institutions of the United States.

The prescribed books and books suggested for supplementary reading are listed two years in advance, the list may be changed at the end of each two-year period.

DIVISION OF MATHEMATICS, ASTRONOMY, AND PHYSICS

The Honors work in the Division of Mathematics, Astronomy, and Physics is conducted jointly by these departments of the College. The Committee in charge consists of Dr. Miller, Mathematics and Astronomy, *Chairman;* Dr. Marriott, Mathematics and Astronomy; and Dr. Wright, Physics.

The course presumes a grounding in preparatory and cultural subjects. As fundamental for reading for honors in this division the students must have taken in class, under instructors, Trigonometry, Algebra, Plane Analytic Geometry, Solid Analytic Geometry, Calculus, Advanced Calculus and Differential Equations. The Honors course then takes up Spherical Trigonometry, Theory of Equations, Theory of Determinants and their Application, Infinite Series and Infinite Products, Introduction to the Theory of Simpler Functions, Theory of Finite Differences and Interpolations, and a short history of Mathematics, Astronomy, or Physics. Three or four subjects are selected from the following: Theory of Differential Equations, Mechanics, Theory of Probability, Advanced Analytic Geometry, Theory of Vectors, Theoretical Physics. The student who majors in Astronomy will read in addition the Theory and Practise of Determining Stellar Parallax, or Photometry, or Theory of Orbits.

DIVISION OF FRENCH

The work of students reading for honors in French is directed by Professors Bronk and Bagley. This work comprises:

(a) A practical knowledge of the French language as it exists today, with the power to write, speak and pronounce it with some degree of excellence; also an acquaintance with French literature from its beginnings. This knowledge may be largely obtained

by following *in cursu* thirty-six hours of class-room work given here at the College.

(b) Familiarity with the history of France, its civilization, arts, etc., as well as with the history and development of the French language from the earliest times. This latter is to be obtained by studying Nyrop, *Grammaire historique de la langue française*, Part I, and Brunot, *Histoire de la langue française*, Parts I-IV. The ability to read the simpler literary monuments of the Old French period in their original form is required.

(c) A thorough and rather detailed study of some one field or epoch of French literature or of some one writer.

(d) A good reading knowledge of either Italian or Spanish and the ability to pronounce this language.

At the weekly conference hours honors students give reports in French and all discussion is carried on in French.

DIVISION OF THE CLASSICS

The work of students reading for Classical Honors is directed by the Professors of the Department of Greek and Latin. The course includes, as stated subjects, the Greek and Latin languages, Greek moral and political philosophy, the histories of ancient Greece and Rome, and, as optional subject, Greek and Roman fine art. Students follow one or the other of the following programs according to whether they elect Greek or Latin as a major language.

(a) For Classical Honors with Greek as major.

Seven prescribed studies as follows: Greek and Roman History, Greek Tragic Drama, Greek Philosophy, Greek Epic, Greek Prose Composition and unseen Translation, Roman Satire, Roman Epistolary and Biographical Literature.

Two elective studies from the following: Greek orators and historians, Greek Comedy, Greek Lyric, Greek and Roman Archæology.

(b) For Classical Honors with Latin as major.

Seven prescribed studies as follows: Greek and Roman History, Roman Epic, Roman Satire, Roman orators and historians, Latin

Prose Composition and unseen Translation, Greek Tragic Drama, Greek Philosophy.

Two elective studies from the following: Roman Epistolary and Biographical Literature, Roman Novel, Roman Lyric, Greek and Roman Archæology.

FOREIGN LANGUAGE REQUIREMENTS FOR HONORS STUDENTS

To take effect as stated below in 1924-25 and succeeding years, the following language requirements must be met by all candidates for graduation with honors in the English Group, the Group in the Social Sciences, and such of the other groups as may accept it:

A reading knowledge of two of the following languages, at least one of which must be chosen from the first list:

List I. French, German, Spanish, Italian.
List II. Latin, Greek.

Honors students are urged to complete these language requirements at the end of the Sophomore year or at the earliest possible date hereafter. In any event they must present themselves for examination in one language before the end of their Junior year, and in the second language before the end of the first semester of their Senior year. However, for Seniors during the year 1924-25 the requirement shall be one language examination before the end of the first semester and the second examination at least three weeks before the final oral examination.

RULE COVERING CASES OF STUDENTS DROPPING HONORS WORK

It is, of course, expected that honors students will continue normally in honors work for two years, being examined only at the end of that time, except for a reading knowledge of languages as provided in the regulations dealing with that subject. Only reasons of a grave character justify a student in giving up honors work, or the faculty of the group in dropping a student, prior to the end of the two year period. Whenever necessary such action should be decided upon immediately prior to the end of a semester. In all such cases the student involved shall take an examination in each of the subjects covered during

his continuance in honors work, and be given hours of credit equivalent to the total number of hours he would have earned in ordinary courses during the same period, with grades determined by the degree of success attained in the said examinations. The number of hours of credit to be assigned the student in each subject he has pursued in honors work shall be determined by the head of the honors group concerned in consultation with his colleagues of the same group.

UNIFORM CURRICULUM FOR THE FRESHMAN YEAR IN THE COURSES IN ARTS

FRESHMAN YEAR

COURSE IN ARTS

First Semester			Hours per Week		
See Page			Class	Lab'y	Credits
	Major Study or Elective		—	—	3
62	English 1	Composition	2	—	2
63	English 4	General Introduction	3	—	3
119	Mathematics 252	Algebra	3	—	3
	or				
121	Astronomy 262	Descriptive Astronomy	—	—	—
69-77	Language		3	—	3
	Elective		—	—	3
125	Physical Education		2	—	—
		Totals	13	—	17

Second Semester					
	Major Study or Elective		—	—	3
62	English 1	Composition	2	—	2
63	English 4	General Introduction	3	—	3
119	Mathematics 253	Trigonometry	3	—	3
	or				
121	Astronomy 262	Descriptive Astronomy	—	—	—
69-77	Language		3	—	3
	Elective		—	—	3
125	Physical Education		2	—	—
		Totals	13	—	17

THE COURSES OF STUDY IN APPLIED SCIENCE

The degree of Bachelor of Arts in Mechanical Engineering, in Civil Engineering, in Electrical Engineering, in General Engineering, in Chemical Engineering, and Chemistry, is conferred upon students who complete the prescribed work as outlined under these departments.

UNIFORM CURRICULUM FOR THE FRESHMAN AND SOPHOMORE YEARS IN APPLIED SCIENCE

The curriculum for the first and second years of the four-years' courses leading to degrees in the Departments of Mechanical, Civil, Electrical, General, and Chemical Engineering is the same in nearly every respect. For their first and second years students in Chemistry as applied science and in Chemical Engineering follow the same courses as given below except that women students take certain electives instead of the prescribed courses, where specified.

FRESHMAN YEAR

COURSES IN APPLIED SCIENCE

First Semester			Hours per Week		
See Page			Class	Lab'y	Credit
119	Mathematics 252	Algebra	3	—	3
119	Mathematics 253	Trigonometry	2	—	2
69-77	Group 2	Language	3	—	3
62	English 1 (b)	Composition	2	—	2
94	Chemistry 171	General Inorganic	2	3	3
113	Engineering 191	Drawing	—	6	2
113	Engineering 223	Surveying	1	3	2
125	Physical Education		2	—	2
		Totals	15	12	17

Second Semester					
119	Mathematics 252	Algebra	2	—	2
120	Mathematics 254	Analytic Geometry	3	—	3
69-77	Group 2	Language	3	—	3
62	English 1 (b)	Composition	2	—	2
66	English 17	Extempore Speaking	1	—	1
94	Chemistry 171	General Inorganic	2	3	3
113	Engineering 193	Descriptive Geometry	—	6	2
114	Engineering 200	Principles of Manufacturing	—	3	1
125	Physical Education		2	—	—
		Totals	15	12	17

SOPHOMORE YEAR

COURSES IN APPLIED SCIENCE

First Semester			Hours per Week		
See Page			Class	Lab'y	Credits
120	Mathematics 259	Solid Analytic Geometry	2	—	2
120	Mathematics 255	Differential Calculus	3	—	3
69-77	Group 2	Language	3	—	3
97	Chemistry 185	Qualitative Analysis	1	6	3
123	Physics 271	General Physics	3	—	3
113	Drawing 195	Machine Design	—	6	2
114	Materials 213		2	—	2
125	Physical Education		2	—	—
		Totals	16	12	18

Second Semester					
120	Mathematics 256	Integral Calculus	3	—	3
120	Mathematics 257	Analytic Mechanics	3	—	3
69-77	Group 2	Language	3	—	3
97	Chemistry 185	Quantitative Analysis	1	6	3
123	Physics 271	General Physics	2	3	3
114	Engineering 234	Elements of Electrical Engineering	2	—	2
115	Engineering 201	Mechanics Problems	—	3	1
125	Physical Education		2	—	—
		Totals	16	12	18

COURSE ADVISERS

All students are expected to confer with their respective course advisers before enrolling in classes. The professor in charge of the major subject will serve as course adviser for each student who has chosen a major subject. The President will designate the course adviser for students who have not chosen their major subjects.

EXTRA WORK DONE OUTSIDE OF CLASSES

No student will be granted credit for work in excess of that regularly listed on the Enrollment Card unless permission to do so is granted by the Committee on Prescribed and Extra Work at the written request of the course adviser. All students except those desiring credit for intercollegiate debating must gain permission of the Committee on Prescribed and Extra Work before the work is entered upon.

SUMMER SCHOOL WORK

Students desiring to transfer credit in a prescribed subject from a University Summer School are required to secure the endorsement of the head of the department concerned before entering upon the work.

REMOVAL OF CONDITIONS

Members of the graduating class must make up all outstanding conditions and deficiencies by the end of the first semester of the senior year, and no student whose record is not then clear shall be considered a candidate for graduation in that year.

All conditions must be made up in the semester immediately following that in which the work reported as conditioned was done, and as early in the semester as possible; except that by special permission of the professor concerned the time for making up the condition may be extended to the second semester following in case (1) the course for which the condition was imposed was not repeated until said second semester, and (2) it is considered necessary by the professor that the student should

make up part or all of the class or laboratory work involved at the time the course is repeated. Any condition not made up within a year from the time it is imposed shall thereafter have the effect upon the records of an "E," *i. e.*, complete failure, which cannot be made up.

SYSTEM OF GRADES

Reports of students' work are received at the Dean's office four times a year; at the end of each semester and at each mid-semester. All grades are mailed to parents at the end of each semester, and are also given out to students at each mid-semester and at the end of the first semester.

The following system of marking is used by instructors: A (excellent, 100-90 per cent.); B (good, 89-80 per cent.); C (fair, 79-70 per cent.); D (poor, 69-60 per cent.); E (failed); W (withdrawn); Cond. (Conditioned).

The mark "conditioned" shall be reported for only two reasons: (1) for unsatisfactory work in a semester course in which the condition may be removed by doing satisfactory work either in another semester course which involves the subject-matter of the first course or in the second semester of a year's course; (2) when the work of a course is complete; that is, when the work done in the course is satisfactory with the exception of a small, definite part of it; for example, the writing of a theme, the reading of an assignment, or the taking of a final examination. The mark "conditioned" shall not be given to a student whose work in a course has been below the passing grade. Such a student shall be reported "E" (failed).

When the reports of grades are filed at the Dean's office, the exact character of the conditions imposed will be defined, and the nature of the work required to remove conditions reported in writing. The student will then be notified by the Dean of the terms of the conditions.

ABSENCES FROM EXAMINATION

Any student who is absent from an examination, announcement of which was made in advance of the date of the examination, shall be given an examination at another than the scheduled

hour only after presentation by the student to the instructor in charge of the course (1) of a certificate from the Committee on Absences that the student has submitted a written statement satisfactorily explaining the cause making the absence from examination imperatively necessary, and (2) of a receipt from the office of the superintendent for a fee of $2. This fee shall be remitted only in the case of duly certified quarantine. In case of continuous illness the maximum fee shall be $5.

No examinations *in absentia* shall be permitted. This rule shall be interpreted to mean that instructors shall give examinations only at the college and under direct departmental supervision.

ABSENCES FROM CLASSES

Each instructor shall make on the form provided for the purpose daily reports of student absences to the offices of the Dean.

All powers of supervision and discipline over student absences are vested in a Committee on Absences to be composed of the Dean, the Dean of Women, both *ex officio,* and three other faculty members appointed annually by the President of the College, who shall designate the Chairman of the Committee from among its members.

In dealing with all student absences the Committee on Absences shall classify them either (a) as allowable absences, or (b) as disallowed absences. Allowable absences are absences which in the opinion of the Committee on Absences are incurred for sufficient cause. By sufficient cause is meant any grounds for absence which would justify failure to keep a stated business appointment; provided, however, that no absence shall be considered allowable by the Committee on Absences unless a written explanation of it is made by the student incurring it on a form provided for this purpose at the Dean's office. Such explanation must be made by the student in advance of the absence, when possible. Written explanations of all absences must be filed at the Dean's office within three college days after the absence, or such absences will be disallowed automatically.

All absences not coming under the definition of allowable absences shall be considered disallowed absences subject to discipline. In the exercise of their powers of discipline over absences

of the latter character the Committee on Absences may warn students, parents or guardians; may place students on probation and fix the terms of said probation; and may require students to make hours of credit for graduation in addition to the requirements as stated in the Catalogue; provided that, in the case of students who reach the end of the first semester of their senior year with a penalty of less than one full hour of credit imposed under this section, said penalty may be removed by the Committee on Absences. For the year 1924-25 students will be penalized one-half credit hour for each disallowed absence after the fifth.

For each disallowed absence on days beginning or ending all vacations and holidays, including the summer vacation, students shall be required to make one half hour credit for graduation in addition to the requirements as stated in the Catalogue. Absences penalized under this section cannot be subject to discipline provided under other sections of these rules.

Students shall have the right to a hearing before the Committee on Absences in cases involving the imposition of credit penalties by the Committee, and the right to petition the faculty in cases where, after such hearing has been given, they are dissatisfied with the decision of the Committee. In all questions involving the number of a student's absences the reports of Instructors shall be considered authoritative.

EXCLUSION FROM COLLEGE

The College reserves the right to exclude at any time students whose conduct or academic standing it regards as undesirable, and without assigning any further reason therefor; in such cases the fees due or which may have been paid in advance to the College will not be refunded or remitted, in whole or in part, and neither the College nor any of its officers shall be under any liability whatsoever for such exclusion.

DEGREES

BACHELOR OF ARTS

The degree of Bachelor of Arts is conferred upon students who have complied with the requirements for graduation as stated on pages 43 to 59.

MASTER OF ARTS*

1. The degree of Master of Arts may be conferred upon graduates of Swarthmore College or of other institutions of satisfactory standing who have spent at least a year in residence at this College, pursuing a systematic course of non-professional study approved by the faculty. The amount of work required of candidates for the Master's degree consists of the equivalent of thirty credit hours in courses of instruction of advanced grade, of which at least twenty hours shall be in a major subject and the remainder in a minor subject to be approved by the professor in charge of the major subject. All candidates must have fulfilled the requirements for the Bachelor's degree before entering upon graduate work. In no case will the Master's degree be conferred upon students in less than one year after the conferring of the Bachelor's degree. It must be understood, however, that only students of ability and maturity will be able to finish the work in one year. No person will be recommended for the Master's degree who shall not have attained a grade of A or B on examination in each subject.

Each candidate for the Master's degree must prepare a satisfactory thesis on a subject assigned by the professor in charge of the major subject, and must pass a final oral examination before a committee of the faculty composed of the professors in charge of the major and minor subjects respectively, and three other members of the faculty appointed by the President of the College. A majority vote of this committee is required for

* Candidates holding the degree of Bachelor of Science, who have fulfilled all the requirements prescribed for the degree of Master of Arts, may at their option receive the degree of Master of Science.

favorable recommendation to the faculty. This examination will be held only when notification of the intention to appear for examination is given to the Dean on or before the first of April of the year in which the candidate desires to receive the degree. The thesis must be presented on or before May 25th of the year in which the candidate desires to receive the degree, and a bound copy of the thesis must be deposited in the college library by July following.

Every candidate shall pay the regular tuition for each year of residence and a diploma fee of $5.

ADVANCED DEGREES IN CIVIL, MECHANICAL, AND ELECTRICAL ENGINEERING

The advanced degrees of Mechanical Engineer (M. E.), Electrical Engineer (E.E.), and Civil Engineer (C.E.), may be obtained by graduates who have received their Bachelor's degree in engineering upon the fulfilling of the requirements given below:

1. The candidate must have been connected with practical engineering work for three years since receiving his first degree.

2. He must have had charge of engineering work and must be in a position of responsibility and trust at the time of application.

3. He must make application and submit an outline of the thesis he expects to present, one full year before the advanced degree is to be conferred. After this application is made he will receive an outlined course of study to pursue during the year.

4. The thesis must be submitted for approval, and satisfactory evidence given that the reading requirement has been met one calendar month before the time of granting the degree.

5. Every candidate shall pay a registration fee of $5 and an additional fee of $20 when the degree is conferred.

DEPARTMENTS AND COURSES OF INSTRUCTION

English

The instruction in this department is under the direction of Professor Harold C. Goddard. Dr. Philip M. Hicks, Dr. Hoyt H. Hudson, and Mr. Roy P. Lingle are Assistant Professors; Miss Amphillis T. Middlemore, Dr. Robert E. Spiller, and Dr. Kate W. Tibbals are Instructors.

The purpose of the work in English is to encourage the writing of clear, forceful, idiomatic English, and to arouse and foster love of good literature. A special effort is made to keep in view, at all times, the application of the works studied to the life and problems of the present day.

The requirements and electives in Composition may be seen below. Of the courses in English Literature, Course 4 fulfills the prescription in English Literature, and is a prerequisite to all other courses in English; Courses 8, 10, 11 (b), and 12 are open to all students who have completed Course 4; Courses 6, 7, 9 and 11 (a) are open to all students who have completed six additional hours elected from Courses 8, 10, 11 (b), and 12, and also, with the consent of the instructor, to Juniors and Seniors whose major subject is not English; Course 14 is open as stated under that course.

1. Composition. Assistant Professors Hicks, Hudson, and Lingle, Miss Middlemore, Dr. Spiller, and Dr. Tibbals.

Two hours a week throughout the year. Offered annually.

Prescribed, in the Freshman year, for all candidates for graduation. Short and long themes and regular conferences throughout the year, together with assigned collateral reading.

2 (*a*). Second Year Composition. Dr. Tibbals.

Two hours a week throughout the year. Offered annually.

Prerequisite, Course 1. This course continues, along more advanced lines, the work of the Freshman year, emphasis being placed upon expository writing.

2 (*b*). Journalism. Assistant Professor Lingle.

Two hours a week throughout the year. Not offered in 1924-25.

A course in the writing of news and special feature articles. The history and present status of the American newspaper are also discussed.

2 (*c*). Practice Course in Writing. Dr. Spiller.

Two hours a week throughout the year. Offered annually.

A course in creative writing without specific assignments, except occasionally in individual cases. The work is conducted through reading of original work, conference, criticism and self-assignment. Open to those who have completed Course 1 and who are not taking any other writing courses at the same time, but primarily intended for those who look upon writing at least as an avocation. Enrollment must be accompanied by some writing done within the preceding six months.

3 (*a*). Narrative Writing. Professor Goddard.

Two hours a week throughout the year. Offered annually.

The chief emphasis of this course is on the short story: the analysis of its structure and practice in writing it. In the second semester some time is devoted to the writing of one-act plays.

3 (*b*). Poetics and Literary Criticism. Dr. Tibbals.

One or two hours a week throughout the year. Offered in 1924-25.

The course is devoted to the study of the theory of poetry and the history and theory of criticism. Lectures and discussions with papers involving the careful study of a few masterpieces.

ENGLISH LANGUAGE AND LITERATURE

4. General Introduction to English Literature. Assistant Professors Hicks and Lingle, Miss Middlemore, Dr. Spiller, and Dr. Tibbals.

Three hours a week throughout the year. Offered annually.

The first semester of Course 4 is devoted to a general introduction to the study of literature. Representative examples of lyric and narrative poetry, of the drama, novel, and essay are discussed and criticised in the classroom. The second semester is given to a rapid survey of the history of English literature from the Anglo-Saxon to the Victorian period. A large amount of collateral reading and frequent written reports are required during both semesters.

Course 4 is prescribed in the Freshman year for all candidates for graduation, except as noted under 4 (*a*).

4 (*a*). Special Readings in English Literature.

Two hours a week throughout the year.

A survey of the field of English literature emphasizing the more important writers and periods. Required for graduation of all Engineering students in lieu of Course 4.

6. Chaucer. Professor Goddard.

Two hours a week during the second semester. Not offered in 1924-25.

After an introductory study of Middle English grammar and phonology, Course 6 is devoted to a careful reading of a number of the *Canterbury Tales,* several of the Minor Poems, and the *Troïlus and Criseyde.* In 1924-25 a part of the material of this course is given in connection with Course 10 (*a*).

7. The English Drama. Assistant Professor Lingle.

Three hours a week throughout the year. Offered in 1924-25.

Course 7 deals with a selected period or aspect of the English drama.

Course 7 must be continued throughout the year.

8. Shakespeare. Dr. Tibbals.

Three hours a week throughout the year. Offered annually

A critical study of several selected plays of Shakespeare and more rapid reading of the rest of his works.

Course 8 must be continued throughout the year.

9. Prose Fiction. Assistant Professor Hicks.

Three hours a week throughout the year. Offered annually.

Course 9 deals with a selected period or aspect of English fiction, or takes up in more detail the works of a single author.

10. English Poetry. Professor Goddard and Miss Middlemore.

Three hours a week throughout the year. Offered annually.

The work of this course is devoted to a selected period or aspect of English poetry.

In 1924-25 two courses in English Poetry are offered: 10(a). An Introduction to Poetry, by Professor Goddard, three hours a week throughout the year; and 10 (b), Nineteenth Century Poetry, by Miss Middlemore, three hours a week throughout the year.

Course 10(b) must be continued throughout the year.

11. English Prose. Professor Goddard and Dr. Spiller.

Three hours a week throughout the year. Offered annually.

The purpose of Course 11 is to present the development of English thought and of the religious, social and political ideals of the English people, as embodied in the prose literature of a selected period.

In 1924-25 two courses in English Prose are offered: 11 (*a*) Social Ideals in Contemporary Prose, by Professor Goddard; and 11 (c), Eighteenth Century Prose, by Dr. Spiller.

Course 11 must be continued throughout the year.

12. American Literature. Assistant Professor Lingle.

Three hours a week throughout the year. Offered annually.

A survey of the history of American literature, emphasis being placed upon the nineteenth century and upon leading writers.

14. Special Topics. Professor Goddard.

Two hours a week throughout the year. Offered in 1924-25.

The purpose of Course 14 is to cover periods and topics not fully treated in the other courses of the department, and to offer, also, opportunity for the detailed study of selected authors.

Course 14 is intended primarily for Seniors majoring in English; it is open to others only by special permission.

14 (*b*). Research Method. Dr. Spiller.

One hour a week throughout the year. Offered in 1924-25.

This course aims to furnish preparation for graduate work in English and American language and literatures. It comprises a study of where to find and how to use books, with instruction in the preparation and writing of critical and research papers. The work consists in a number of bibliographical problems with instruction and discussion, and the writing of one research paper on a subject chosen by the student. Open only to Juniors and Seniors who are majoring in English and to members of the English Honors Group. Can be taken in conjunction with Course 14.

Dante. Professor A. M. Brooks.

Three hours a week throughout the year. Offered in 1924-25.

Study of the Divine Comedy as a work of consummate literature. Special attention is given to the life and art of the century that produced it.

The Philadelphia libraries of particular value in connection with work in the department of English are the following: the Library of the University of Pennsylvania; the Philadelphia Library; the Mercantile Library; the Free Library of Philadelphia.

Public Speaking

The instruction in Public Speaking is designed to develop and train the voice as an efficient instrument of self-expression and literary interpretation; to give training in the principles and practice of effective public speaking, and in the production of drama.

In the belief that frequent practice in speaking is the requisite for the best results, one hour courses are provided to meet the needs of students who may desire to continue this practice throughout their college term.

The classes meet in small sections in order that each student may receive the personal criticism of the instructor.

15. General Survey of Speech Training. Assistant Professor Hudson.

Three hours a week throughout the year. Offered annually.

A brief historical review of the subject combined with a study of and drill in the principles of voice training, oral reading and speaking.

16. The One-Act Play. Assistant Professor Hicks.

Three hours a week throughout the year. Offered annually.

This course aims to familiarize students with the problems of dramatic production. Four public performances are given during the year. It includes also a study of the Little Theatre movement and of the One-Act Play as a literary form.

17. Extempore Speaking. Assistant Professor Hudson.

One hour a week throughout the year. Offered annually

This course is designed to help students acquire the ability to present their own ideas clearly and effectively. Representative speeches of business and professional men are studied, and students present short speeches before the class each week.

18. Argument. Assistant Professor Hudson.

One hour a week throughout the year. Offered annually.

This course deals with the theory and practice of argumentative discourse. Foster's *Argumentation and Debating* is used as a text. Course 18 should be taken by students seeking credit for Intercollegiate Debating.

19. Public Discussion. Assistant Professor Hudson.

One hour a week during each semester. Offered annually.

This course aims to familiarize students with the employment of the various methods of persuasion that are effective in public discussion. Weekly practice in speaking is continued, speech topics being drawn from questions of current interest.

20. Seminar in Speech and Dramatic Training. Assistant Professor Hicks.

This course provides opportunity for advanced study under individual instruction to students who have completed scheduled courses in either field. From one to three hours credit may be given depending upon the work assigned.

INTERCOLLEGIATE DEBATE

Students enrolling for Intercollegiate Debate may receive from one to three hours credit at the discretion of the Instructor, depending upon the quality of the work done. Candidates for the debate squads must complete all required reading and attend weekly practice during the debating season.

The debates are held under the supervision of the Debate Board, an undergraduate body including all students who have represented the College in forensic contests, and the coach of the debate teams.

Public Speaking Contests and Prizes

The Swarthmore Chapter of Delta Sigma Rho, the national honorary forensic society, elects to membership each spring students who have done distinguished work in debate and other public speaking contests. To be eligible, students must have engaged in forensic activities for two years and must have represented the College in an intercollegiate contest.

The public speaking contests, which are conducted by the Debate Board, are designed to bring out the ability of the students and to stimulate interest in forensic events.

The *Delta Upsilon Prize Speaking Contest* provides a prize of $25 for the winner. The sum of $500 has been given to the College by Owen Moon, Jr., Class of 1894, the interest from which is to be used for this purpose.

The *Ella Frances Bunting Prizes for the Extemporaneous Speaking Contests* are provided by a gift of $1,000 from E. M. Bunting, of New York. Two prizes of $25 are offered, one contested for by the men and one by the women students.

The *Phi Kappa Psi Prizes* in Public Speaking, offered by the local chapter of that fraternity, are open to competition among preparatory schools. The contest is held at the College annually on the first Saturday in May.

The *Potter Prize Contest* for Extemporaneous Debate is open to all students and prizes of $12, $8 and $5 are offered for the best individual speeches. This contest was founded by the late Justice Wm. P. Potter, and is continued as a memorial to him.

The *Sophomore-Freshman Debate* is open to all members of the two classes excepting those who have represented the College in intercollegiate contests. The medals for the members of the winning team are given by the President of the College.

French and Spanish

The instruction in this department is under the direction of Professor Isabelle Bronk. Mr. Charles R. Bagley is Assistant Professor, Señorita Mercedes C. Iribas is Instructor in Spanish, Madame Blanche Poulleau Crawford is Instructor in French, and Miss Margaret Pitkin is Student Assistant.

The courses of study in French are designed to afford a certain degree of literary culture, as well as to impart thorough training in the grammar and linguistics of the language. Until the end of the second year the authors studied are all selected from those of modern times and the greatest attention is given to colloquial French. The student is then ready to be brought into contact with the more artificial (rhetorical) forms of expression constantly occurring in the higher grades of literature. The fact that French is a living tongue is kept ever in view. For this reason but little English is used in the classroom. Free composition, dictation, memorizing, and conversation are required throughout the courses. Much attention is given to pronunciation, practical phonetics being taught in all courses, and the relations of modern French to classical, popular, and low Latin are brought often before the students.

The courses in Spanish are arranged with a view to giving, as far as possible, a practical knowledge of this language, and also some idea of the modern literature of Spain.

From eleven to fourteen courses in French are offered each year. The class in Course 21 is divided into two sections, the class in Course 22 into five, the class in Course 23 into two.

Students who are prepared in Elementary French, as defined by the College Entrance Examination Board, enter Course 22; those who are prepared in Intermediate French enter a specially arranged section of this same course; those who are prepared in Advanced French, as defined by the College Entrance Examination Board, enter Course 23.

Students who elect French as a major study are required to complete the work of five full years, or thirty "hours," and to take Course 34.

The first semester's work in Elementary French and Elementary Spanish will not be accepted toward a degree unless followed by the work of the second semester in the same language.

Some of the lists of works studied, as given below, are subject to a slight modification.

21. Elementary French. Assistant Professor Bagley and Madame Crawford.

Three hours a week throughout the year. Offered annually.

This course is intended for those who begin French in college. Its aim is to enable the students to read ordinary French with ease, to understand to some extent the language when spoken, and to form simple sentences, both oral and written.

Fraser and Squair, *Shorter French Course,* and Allen and Schoell, *French Life.*

Open to all students.

22. Reading of Nineteenth Century French Prose and Poetry, Grammar, and Composition. Professor Bronk, Assistant Professor Bagley, Madame Crawford, and Miss Pitkin.

Three hours a week throughout the year. Offered annually.

This course is designed to supplement and extend Course 21. Prose composition and drill upon the essential principles of the grammar are continued; much attention is given to idioms and synonyms; the reading becomes more rapid; and French is made almost exclusively the language of the classroom.

Fraser and Squair, *Shorter French Course,* continued, De Sauzé, *Grammaire française.* Modern plays and selected works of Balzac, Bazin, Coppée, Erckmann-Chatrian, Daudet, Hugo, Maupassant, Mérimée, or others.

Prerequisite, Course 21 or its equivalent.

23. Seventeenth Century French History and Literature, and Composition. Professor Bronk and Madame Crawford.

Three hours a week throughout the year. Offered annually.

This course is conducted mainly in French. Particular attention is given to the social as well as to the literary tendencies of the time, and the students present reports upon pertinent topics as well as abstracts of the works read.

Lectures on the history and society of the seventeenth century. Corneille, *Le Cid* and *Horace;* Molière, *Les Précieuses ridicules* and *Le Bourgeois Gentilhomme;* Racine, *Andromaque* and *Athalie;* La Fontaine, *Fables* (ed. Hachette); Hill and Smith, *Advanced French Composition,* Part I.

Prerequisite, Course 22 or its equivalent.

24. Advanced French Prose Composition. Assistant Professor Bagley.

Two hours a week during the first semester. Offered annually.

The aim of this course is to give increased facility in the writing of the French language, by means of intensive study of chosen models and translation and paraphrase of English into French. Much free composition is also required. Frequent conference periods care for the students' individual needs.

Hill and Smith, *Advanced French Composition,* Part II.

Prerequisite, Course 23 or its equivalent.

25. Practical Phonetics. Assistant Professor Bagley.

Two hours a week during the second semester. Offered annually.

This course is designed to give the student increased facility and greater precision in spoken French, by means of a scientific study of the sounds of the French language.

Phonetic dictation, readings in French, conversation, etc. Paul Passy, *Sounds of the French Language.*

26. Seventeenth Century French Prose. Madame Crawford.

Two hours a week during the first semester. Offered in 1924-25.

This course is conducted in French. Informal lectures are given and these are accompanied by discussions of the works studied, by collateral reading, and by reports.

Selections from Descartes, *Discours de la Méthode;* from Pascal, *Les Provinciales* and *Pensées;* from La Rochefoucauld, *Maximes;* from Bossuet, *Oraisons funèbres;* from Madame de Sévigné, *Lettres;* and from La Bruyère, *Les Caractères.*

Prerequisite, Course 23 or its equivalent.

27. Balzac. Madame Crawford.

Two hours a week during the second semester. Offered in 1924-25.

A survey of the novel in France and a study of Balzac's representative works. In French.

Prerequisite, Course 23 or its equivalent.

28. History of the French Novel. Madame Crawford.

Two hours a week throughout the year. Offered in 1925-26.

The French novel is here considered both in its origins and development and in its portraiture of life. Morillot's *Le Roman en France depuis 1610 jusqu'à nos jours* is used as a textbook, and representative novels are read by the students outside of the class. The course is conducted in French.

Prerequisite, Course 23 or its equivalent.

29. French Drama. Assistant Professor Bagley.

Two hours a week during the year. Offered in 1925-26.

The drama from its beginnings to the present day, with especial emphasis on the eighteenth and nineteenth centuries.

Lectures, reading and discussion in class of representative plays, parallel reading, and essays.

Prerequisite, Course 23 or its equivalent.

30. Nineteenth Century French Literature. Assistant Professor Bagley.

Two hours a week during the year. Offered in 1924-25.

Lectures, reading, discussions, and reports. In French.

Prerequisite, Course 23.

31. Twentieth Century French Literature. Professor Bronk.

One hour a week throughout the year. Offered in 1924-25.

Lectures, reading, discussions, and reports. In French.

Prerequisite, Course 23.

32. Voltaire and Jean-Jacques Rousseau. Professor Bronk.

One hour a week throughout the year. Offered in 1925-26.

A thorough study of the lives and works of these two writers. In French.

33. French Lyric Poetry and Versification. Professor Bronk.

One hour a week throughout the year. Offered in 1925-26.

A study of lyric poetry from Villon to the end of the nineteenth century. An examination of French verse-structure from its origin to the present. The work is given in French. Canfield's *Lyrics* is used as a textbook and is supplemented by further reading from the poets studied.

Prerequisite, Course 23.

34. Outline Course in French Literature. Professor Bronk.

Two hours a week throughout the year. Offered annually.

This course is designed as a review and extension of the courses in literature already pursued. Much attention is devoted to the literary monuments of the Old French period, these being read as far as possible in Modern French translations. The literature of the Renaissance is then taken up, after which consideration is given to the movements and tendencies of later times, the different writers and their works. The ouside reading is both wide and varied. This course is conducted in French, by means of lectures, collateral reading, reports, and research work. Pellissier, *Littérature Française*, is used as a handbook.

Open to advanced students who are able to speak and understand the French language. Credit for three hours is given.

35. Elementary French Conversation. Assistant Professor Bagley and Madame Crawford.

One hour a week throughout the year. Offered annually.

36. Advanced French Conversation. Madame Crawford.

One hour a week throughout the year. Offered annually.

37. Elementary Spanish. Miss Iribas.

Three hours a week throughout the year. Offered annually.

This course aims to give a knowledge of the essentials of Spanish grammar, the ability to read ordinary Spanish with ease, and some practice in conversation. Hills and Ford, *First Spanish Course; Cuentos Modernos.*

38. Second-year Spanish. Miss Iribas.

Three hours a week throughout the year. Offered annually.

Crawford, *Spanish Composition;* reading of six modern novels and plays, and conversation based upon these works.

39. Third-year Spanish. Miss Iribas.

Three hours a week throughout the year. Offered annually.

Cervantes, *Novelas ejemplares;* selections from *Don Quixote;* Lope de Vega, *La Moza de Cántaro, La Estrella de Sevilla;* Calderon de la Barca, *La Vida es Sueño, El Alcalde de Zalamea.* Composition and conversation.

The French Library is supplied with the treatises and books of reference necessary to illustrate the courses given. It is enriched annually by important additions.

Occasional public lectures are given by French scholars or men and women of note.

The *Cercle Français* meets once a month during the academic year.

German Language and Literature

The instruction in this department is under the direction of Professor Clara Price Newport.† Mr. H. W. Nordmeyer is Acting Assistant Professor.

The elementary courses of study in this department are designed primarily to equip the student with a working knowledge of the German language as a key to the treasures of German science, philosophy, and literature, and the more advanced courses are intended to impart a knowledge of the development of German literature and to foster appreciation of its masterpieces.

In the classroom, translation into English is discontinued as soon as possible and expressive reading of the German text is substituted, and German is made the classroom language as early as possible. The idiomatic sentence and modern colloquial language form the basis of the work in composition. Reading and translation at sight are cultivated. The attainment of a correct literary understanding and of genuine appreciation of some of the best things in German literature is regarded as the highest aim.

Other texts may at times be substituted for some of those indicated.

The first semester's work in Courses 41, 42, 43, and 49 will not be accepted toward a degree unless followed by the work of the second semester.

Students who desire it are given an opportunity to carry on, under direction, correspondence with students in Germany.

Facilities in Philadelphia and vicinity of especial value to work in the department of German are as follows: the general and special libraries of Swarthmore College, University of Pennsylvania, Haverford, Bryn Mawr, Drexel Institute, Philadelphia Public Library; Germanic collections of the museums in Memorial Hall, Drexel Institute, University of Pennsylvania Museum; services in German at several churches; several daily and weekly newspapers; lectures at the German Society.

†Absent on leave during 1924-25.

41. Elementary German. Professor Newport.

Three hours a week throughout the year. Offered annually.

B. J. Vos, *Essentials of German;* Bierwirth and Herrick, *Ährenlese;* Leander, *Träumereien;* Storm, *Immensee;* Baumbach, *Der Schwiegersohn.* Persistent training in composition, conversation, and expressive reading.

42. Advanced German. Professor Newport.

Three hours a week throughout the year. Offered annually.

Review of grammar, practice in composition, conversation, and expressive reading, and, principally, reading of some recent short stories, of a representative modern play, of lyrics and ballads, and of one of Schiller's masterpieces.

Prerequisite, Course 41 or equivalent.

43. Lessing—Schiller. Professor Newport.

Three hours a week throughout the year. Offered annually.

A survey of the lives and works of these authors with special attention to Lessing's *Minna von Barnhelm, Emilia Galotti,* and *Nathan der Weise, Die Erziehung des Menschengeschlechts,* and to Schiller's ballads and poems, selected prose writings, and five of the dramas.

Prerequisite, Course 42 or equivalent.

44. Goethe. Professor Newport.

Three hours a week throughout the year. Offered annually.

Goethe's *Werke, Goldene Klassiker-Bibliothek.* A careful study of Goethe's life and works. Conducted in German.

Prerequisite, Course 43 or equivalent.

49. Scientific German. Professor Newport.

Three hours a week throughout the year. Offered annually.

Wallentin, *Grundzüge der Naturlehre;* Greenfield, *Introduction to Chemical German;* Scholz, *German Science Reader;* Wait, *German Science Reader;* Dippold, *A Scientific German Reader.* For students majoring in pure and applied science. This course prepares the student to read the new material along scientific lines which is continually coming out in German books and periodicals.

Prerequisite, Course 42 or equivalent.

52. Recent German Literature.

Three hours a week, second semester. Offered in 1924-25.

A rapid reading course in important modern authors.

Only open to students who have taken German courses beyond Course 44.

53. German Conversation and Composition.

Two hours a week throughout the year. Offered in 1923-24.

Constant practice in the use of idiomatic German both orally and in writing.

Prerequisite, Course 42 or equivalent.

55. The German Drama in the Nineteenth Century.

Three hours a week, first semester. Offered in 1924-25.

The development of the drama in Germany since the plays of Goethe and Schiller, with special attention to Kleist, Grillparzer, Hebbel, Ludwig, Anzengruber, Hauptmann, and Sudermann.

Prerequisite, fluency in reading and speaking German.

Greek and Latin

The instruction in this department is under the direction of Professor D. L. Drew. Dr. Ethel Hampson Brewster is Associate Professor. Course 70 is conducted by Professor Alfred Mansfield Brooks.

The aim of the department is primarily to create an appreciation of the masterpieces of Greek and Latin literature and to trace their influence upon modern thought and letters; attention is given to the political institutions of both Greece and Rome and their survival in present times, to philosophy and religion, to private and social life, and to art and architecture as exemplified by existing remains in sculpture and painting and in private and public buildings. Use is made of illustrative material belonging to the College and of the collections of the University Museum of Philadelphia.

Special attention is called to Courses 61 and 62 in Greek and 71 in Latin, which are provided for those who, previous to entering college, have not been able to complete the preparatory work required for admission to the Freshman courses.

Students who enter College with three or four years of Latin will elect Course 72; those who enter with two or three years of Greek will elect Course 64.

A Teachers' Course in Latin (78) is offered for Seniors and Juniors who expect to take positions as teachers of Latin and Greek in public and preparatory schools. Those who elect this course must before the end of the Senior year have pursued at least Courses 72a, 72b, 73a, 73b, and 75; the directors of the department will recommend as teachers of Latin only those who have completed these courses satisfactorily. Such students are expected also to take at least Course 61 in Greek.

GREEK

61. Beginners' Course, Grammar; selected readings; Sophocles, Greek dramatic theory. Professor Drew.

Three hours a week throughout the year. Offered annually.

This course is provided for those who have not had an opportunity of studying elementary Greek in the preparatory school.

62. Xenophon, *Anabasis,* Book I, and Aristophanes, *Clouds.* Professor Drew.

Three hours a week during the first semester. Offered annually.
A continuation of Course 61. Students who complete this course are admitted in the second semester to Course 63.

63. Demosthenes, *Public Speeches.* Professor Drew.

Three hours a week during the second semester. Offered annually.

64. (*a*) Selected Dialogues of Plato, including the *Crito, Apology,* and *Phaedo.* Lectures on the doctrines of the various schools of Greek philosophy. Professor Drew.

Three hours a week during the first semester. Offered annually.
Students who enter college with at least two years of Greek elect this course.

64. (*b*) Greek tragedy, Æschylus, *Prometheus;* Sophocles, *Antigone;* Euripides, *Alcestis.* Professor Drew.

Three hours a week during the second semester. Offered annually.

65. (*a*) Historical Prose; selected books of Herodotus and Thucydides; some account of the early Greek historians. Professor Drew.

Two hours a week during the first semester. Offered as required.

68. Greek Prose Composition. Professor Drew.

Two hours a week during the second semester. Offered as required.
The purpose of this course is to give facility in the writing of simple Greek prose.

69. The New Testament. Professor Drew.

Two hours a week during the first semester. Offered as required.

70. Greek and Roman Architecture. Professor Brooks.

Three hours a week during the first semester. Offered in 1923-24.

90. The History of Greece. Professor Drew.

Two hours a week throughout the year. Offered in 1925-26.
The history of Greece, from the earliest times to the death of Alexander the Great. The course aims to give, through lectures, collateral reading, and reports, a history of Greek civilization. Much attention is paid to art, literature, religion, private life, etc.

LATIN

71. Sub-Freshman Latin.

Three hours a week throughout the year. Offered as required.
This course is arranged for those who are not prepared to take the regular Freshman elective. It includes a study of grammar, etymology, technical terms, mythology, and selective readings.

72. (a) Livy, XXI and XXII. Professor Drew.

Three hours a week during the first semester. Offered annually.
See note under Course 72 *b*.

72. (*b*) Virgil, *Eclogues* and *Aeneid*. Professor Drew.

Three hours a week during the second semester. Offered annually.

Courses 72 *a* and 72 *b* form the regular Freshman elective.

73. (*a*) Horace, *Odes* and *Epodes;* studies in the private and social life of the Romans. Associate Professor Brewster.

Three hours a week during the first semester. Offered annually.

See note under Course 73 *b*.

73. (*b*) Cicero's Essays, Selections; Catullus. Associate Professor Brewster.

Three hours a week during the second semester. Offered annually.

Courses 73 *a*, 73 *b* form the regular Sophomore elective.

75. Latin Language and Prose Composition. Professor Drew.

Two hours a week throughout the year. Offered in 1924-25.

This course includes a review of forms and syntax, etymology, the translation of Latin at sight, and practice in reading, writing and speaking Latin.

76. (*a*) Tacitus, *Germania* and *Agricola*. Associate Professor Brewster.

Two hours a week during the first semester. Offered in 1924-25.

76. (*b*) Plautus, Terence, and Martial. Associate Professor Brewster.

Two hours a week during the second semester. Offered in 1924-25.

76. (*c*) The Letters of Cicero and Pliny. Associate Professor Brewster.

Two hours a week during the first semester. Offered in 1925-26.

76. (*d*) Roman Satire. Associate Professor Brewster.

Two hours a week during the second semester. Offered in 1925-26.

78. Teachers' Course. Associate Professor Brewster.

Two hours a week throughout the year. Offered in 1925-26.

Lectures and reports upon Cæsar, Cicero, Virgil, and other Latin authors commonly read in the preparatory schools. For admission to the course see the introductory announcement on page 71.

79. Latin Sight Reading.

Two hours a week throughout the year, one hour credit. Offered as required.

The work of this course is almost exclusively confined to the classroom and requires no outside preparation except for an occasional report upon the life and works of the author studied. Selections from Ovid and from a variety of prose and verse writers will be read.

91. The History of Rome. Professor Drew.

Two hours a week throughout the year. Offered in 1924-25.

The history of Rome from the earliest times to the beginning of the Barbaric Invasions. The course stresses the Roman genius for organization and administration and the significance of "Romanization" in the civilization of the past and the present.

History and International Relations

The instruction in this department is under the direction of Professor William I. Hull. Senior Students majoring in History are the departmental assistants. Professor D. L. Drew, of the Department of Greek and Latin, conducts Courses 90 and 91, on the History of Ancient Greece and Rome.

The courses are conducted by means of classroom lectures and library work, which are co-ordinated by the students in written outlines and reports. The purpose of the department is to afford training in the discriminating use of historical materials; to cultivate the historical and international habit of mind; and to develop a general knowledge of European, English, and United States history, as a whole, together with a more detailed knowledge of certain great epochs, institutions, and personages in the history of western civilization.

90. The History of Greece. Professor Drew.

Two hours a week throughout the year. Offered in 1925-26.

The history of Greece, from the earliest times to the death of Alexander the Great. The course aims to give, through lectures, collateral reading, and reports, a history of Greek civilization. Much attention is paid to art, literature, religion, private life, etc.

91. The History of Rome. Professor Drew.

Two hours a week throughout the year. Offered in 1924-25.

The history of Rome from the earliest times to the beginning of the Barbaric Invasions. The course stresses the Roman genius for organization and administration and the significance of "Romanization" in the civilization of the past and the present Special attention is given to problems that are common to the "Two Great Republics, Rome and the United States."

92. European History and Diplomacy. Professor Hull.

Two hours a week throughout three years.

(*a*) Mediæval Europe and the Renaissance.

Offered in 1925-26.

(*b*) Modern Europe, from the Renaissance to the World War.

Offered in 1926-27.

(*c*) The World War, Its Causes and Results.

Offered in 1924-25.

93. English History and Diplomacy. Professor Hull.

Three hours a week throughout three years.

(*a*) England, to 1603.

Offered in 1924-25.

(*b*) England, 1603-1925.

Offered in 1925-26.

(*c*) The History of Empire.

Offered in 1926-27.

94. American History and Diplomacy. Professor Hull.

Three hours a week throughout three years.

(*a*) American History to 1789.

Offered in 1926-27.

(*b*) The United States, 1789-1877.

Offered in 1924-25.

(*c*) The United States, 1877-1925, and American Diplomacy.

Offered in 1925-26.

95. International Law and Government. Professor Hull.

Two hours a week throughout two years.

(*a*) International Law.

Offered in 1925-26.

(*b*) International Government.

Offered in 1924-25.

96. History Teachers' Course. Professor Hull.

One or two hours' credit for each semester. Offered annually.

This course is designed for senior majors in the Department of History, and is intended primarily to give the theory and practice of aims, methods and aids in the teaching of history. General history is reviewed in a seminar discussion, with Wells's "Outline of History" as its basis; while the practical work of the course is done in neighboring schools, and in connection with Courses 92 to 95.

97. History Readings as prerequisite to Honors Courses.

Students desiring to read for Honors in the Social Sciences are expected to have had the equivalent of Courses 94 *a* and 94 *b;* in the English Honors group, the equivalent of Courses 93 *a* and 93 *b;* in the Romance or the Teutonic groups, the equivalent of Courses 92 *a* and 92 *b;* in the Classical group, the equivalent of Courses 90 and 91.

Political Science

The instruction in this department is under the direction of Professor Robert C. Brooks, assisted by Mr. William M. Blaisdell.

The primary aim of the courses offered in political science is to prepare students for intelligent and effective citizenship.

To this end an effort is made to interpret the political life and movements of our time in city, state, and nation. Particular attention is given to criticisms of existing institutions and proposals for their reform. Governments and parties in the leading foreign nations of the world are considered not only because of their intrinsic importance, but also for the valuable suggestions they may yield for the solution of our American problems.

Though the courses in political science are designed primarily to produce intelligent and effective citizenship, they should also prove more immediately helpful to those who intend to enter politics, law, public service, journalism, business, or the teaching of civics. Students who expect to devote themselves to advanced study and research in political science should be able to lay the foundations for such work in the undergraduate courses offered by this department.

Unsupported by collateral study in economics and history much of the significance of political science will be lost. Psychology, philosophy, and anthropology are also valuable aids. A reading knowledge of German or French should be acquired as soon as possible by students of political science, and both of these are essential for graduate study in this field. Training in English and public speaking is highly desirable.

Changes in advanced courses to be made from year to year will enable students to take more work in political science than is here scheduled.

101. American Political Parties and Party Problems. Professor Brooks.

Three hours a week during second semester. Offered annually.

A study of the growth, organization, aims and methods of political parties in the United States, with particular reference to the financing of parties, primary and convention system, and electoral reforms generally.

Open to all students except Freshmen.

102. American Federal Government. Professor Brooks.

Three hours a week during first semester. Offered in 1925-26.

A study of the present structure and functions of the Federal Government of the United States. Designed as a continuation of Course 101.

Open to all students except Freshmen.

103. Government and Parties in England and Continental Europe. Professor Brooks.

Three hours a week throughout the year. Offered annually.

An outline study of the framework of government and the organization, methods, and aims of the leading political parties of England, France, Switzerland, and Germany. Particular attention is given to the constitutional documents of the countries studied and to the more accessible sources of official information regarding them. Wherever possible, comparisons are drawn between the political institutions and problems of the countries studied and those of the United States.

Open to all students.

105. Municipal Government in the United States. Professor Brooks.

Two hours a week during the first semester. Offered in 1924-25.

A somewhat detailed study of municipal organization and functions in the United States. Particular attention will be given to the city of Philadelphia. Reform proposals, such as the commission plan, the city manager plan, short ballot, and the work of bureaus of municipal research, will be discussed.

Prerequisite, Courses 101, 102, or 103, or the equivalent of one of these.

106. American State Government. Professor Brooks.

Two hours a week during the first semester. Offered in 1925-26.

A study of the organization and functions of state government in the United States, with particular reference to Pennsylvania. The legislative branch will be given special attention in this course for the present.

Prerequisite, Courses 101, 102, or 103, or the equivalent of one of these.

107. Political Motives. Professor Brooks.

Two hours a week throughout the year. Offered in 1924-25.

A study of the motives influencing men in their political activities, particularly as revealed in biographies and autobiographies of American leaders of recent date.

Open only to Juniors and Seniors.

108. Political Ideas. Professor Brooks.

Two hours a week during first semester. Offered in 1924-25.

A study of political ideas from Plato to Sir Henry Maine.

Open only to Honor Students.

109. Special Readings in Political Science. Professor Brooks.

Two hours a week during second semester. Offered annually.

Assigned readings, reports and conferences designed to prepare students along detailed lines in which they are specially interested or to correct deficiencies in their earlier preparation. Required of all students majoring in the Department of Political Science preferably in their Senior year, but may also be taken during their Junior year.

Economics

The instruction in this department is under the direction of Professor Thomas K. Urdahl. Mr. Claude C. Smith and Mr. William M. Blaisdell are instructors.

Good citizenship implies intelligent citizenship. The broadest purpose of college instruction in Economics is to contribute to the former by the cultivation of the latter. From this point of view the study of Economics should appeal to all students. In a narrower way, work in Economics should prove useful to those who intend to devote themselves to law, business, journalism, philanthropy, or the public service. Finally, for those who wish to prepare for investigation or teaching in this field, college instruction, with its closer personal relation between student and teacher, should provide suitable preparation for graduate study and research in larger institutions.

The courses in law are designed to give to the student an insight into legal reasoning and a general knowledge of the fundamental legal relations which govern our society. It is expected that these courses will serve as a helpful introduction to professional study for those who aim to prepare themselves for the life of the lawyer; that those students who desire to equip themselves for active business life will be aided by an intelligent study of principles which lie at the basis of commercial life; and that in the systematic study of the science of the law all will acquire not merely an understanding of legal rules, but also an appreciation of their justice, wisdom, and harmony.

Collateral work in Political Science, History, German, and French is strongly recommended for all who intend to devote much time to Economics. A knowledge of general biological theory, of psychology, and of philosophy would add greatly to the value of work done in this department.

No credit will be given in courses which run throughout the year, unless the work of the entire year is taken.

The advanced courses will be changed from year to year, thus enabling students to take more work in the department than is here scheduled.

111. Principles of Economics. Professor Urdahl and Mr. Blaisdell.

Three hours a week throughout the year. Offered annually.

The first part of this course consists of a study of the fundamental laws and principles of economics; the second part deals with the application of these laws to the public questions of the day, such as those connected with the tariff, taxation, currency, trusts, trade unions, strikes, socialism, and the railroads.

Not open to Freshmen.

112. Money, Credit, and Banking. Professor Urdahl.

Three hours a week during the first semester. Offered annually.

The work of this course will be divided into three parts: (a) a study of the principles of money, credit, and banking; (b) a study of the exemplification of those principles in the monetary and banking history of certain countries; (c) a study of present-day currency and banking problems in the United States. As a supplement to the class-room work, visits will be made to the mint and to banking institutions in Philadelphia.

Prerequisite, Course 111 or its equivalent.

113. Public Finance. Professor Urdahl.

Three hours a week during the second semester. Offered in 1925-26.

The subject matter of this course will be the nature of governmental wants, public expenditures, budgets, and budgetary legislation, the development of tax systems, the different kinds of taxes, the theory of incidence, the problem of distribution, practical ideals for a tax system in the United States, and the theory and extent of public debts.

Prerequisite, Course 111 or its equivalent.

114. Corporation Finance, and Problems of Business. Professor Urdahl.

Three hours a week during the second semester. Offered in 1925-26 *alternately with* 120.

The historical development, the changes in structure, the organizing, the financing, the management, the economic and social problems of business are considered in detail.

Prerequisite, Course 111.

115. Criminology. Professor Urdahl.

Three hours a week during the second semester. Offered in 1925-26.

Three general subjects are treated in this course. The first has to do with the theory and data of criminality. The second subject deals with criminal law and criminal procedure. The third relates to penalogy. Visits are made to the various penal and reformatory institutions in Philadelphia and vicinity.

Open to all students.

116. Modern Philanthropy. Professor Urdahl.

Three hours a week during the first semester. Offered annually.

The large public questions involved in the relief of the indigent and in the care of the insane, the feeble minded, and other dependents. Visits are made to representative institutions in Philadelphia and vicinity.

Prerequisite, Course 111.

117. Resources and Industries. Professor Urdahl.

Three hours a week throughout the year. Offered annually.

The first semester will be devoted to a study of the evolution of Industrial society and the economic organization of modern society. During the second semester special emphasis will be laid upon the development of commerce and the history of commerce.

The class will visit industrial establishments. Open to freshmen.

118. The Development of Economic Theory. Professor Urdahl.

One hour a week throughout the year.

The evolution of economic thought from the writings of the mercantilists and physiocrats down to the present day. Especial attention will be given to the various schools of thought and to their influence in shaping public policy.

Required of senior majors.

119. Labor Problems. Professor Urdahl and Mr. Blaisdell.

Two hours a week during the second semester. Offered in 1925-26.

The course deals with a large group of problems growing out of the relations of capital to labor. After a thorough analysis of the theory of wages, the class will study labor organizations, industrial warfare, conciliation and arbitrations, minimum wage, and a large group of problems that lead to labor legislation.

120. Investments.

Three hours a week during the second semester. Offered in 1924-25.

The course is designed to give the student a general knowledge of the principles governing investments in stocks, bonds, mortgages and other securities.

126. Business Law. Mr. Smith.

Second semester (1924-25).

126. (*a*) Advanced Business Law.

Business organizations and associations and the advantages and disadvantages of each, including formation, financing, management, merger, consolidation and dissolutions; rights and liberties of incorporators, owners, stockholders, directors and officers as between themselves and the public; outstanding rights; practical problems; cases illustrating the law. Prerequisite: Elementary Business Law Course; Junior standing. Three hours. Second semester.

First semester (1925-26).

126. (*b*) Elementary Business Law.

Origin and sources of law; elementary principles of law, with special reference to the law and principles of contracts; sale and transfer of real estate and personal property; bailments. Practical problems. Cases illustrating the law. Prerequisite: Sophomore standing. Three hours. First semester.

Second semester (1925-26).

126. (*c*) Elementary Business Law.

Commercial paper, including all kinds of negotiable instruments; guaranty and suretyship; insurance; bankruptcy; decedents' estates, including inheritance taxes and transfer of property. Practical problems. Cases illustrating the law. Prerequisite: Elementary Business Law, first semester; Sophomore standing. Three hours. Second semester.

History of Philosophy and Religion

The instruction in this department is under the direction of Professor Jesse H. Holmes. The course in Bible Study (131) is given by Dr. George Emerson Barnes.

The object of the courses is to give an introduction to the principal religions and philosophies of the world and a more detailed study of a few of them. A second and equally important object is that of initiating and developing the habit of critical and independent thought.

The work is presented by means of lectures, recitations, discussions, and preparation of themes. A small but carefully selected museum of religious curios, an excellent library and several hundreds of lantern slides are available for teaching together with the usual equipment of maps, charts and pictures.

131. Bible Study. Dr. Barnes.

Two hours a week throughout the year. Offered annually.

Intended to give such general knowledge of the Bible, its origin, contents, and qualities as literature, as should be possessed by all intelligent people. The work of the student will consist largely of indicated readings in the Old and New Testaments.

The class work will include lectures, recitations, study of maps, pictures, etc.

132. History of Religions. Professor Holmes.

Two hours a week first semester. Offered annually.

A brief study of primitive religions and of the principal religious systems of the world. Menzies, *History of Religions*, and Barton, *The Religions of the World*, have been used as text books.

133. History of Christianity. Professor Holmes.

Two hours a week, second semester. Offered in 1924-25.

A survey of the history of the Christian Church beginning with the period of the Book of Acts and coming down to the present time. Especial attention is given to the origin and growth of doctrine, and of the various Christian sects. Allen, *Continuity of Christian Thought*, and Pfleiderer, *Development of Christianity*, have been used as text books.

134. Ethics. Professor Holmes.

Three hours a week, second semester. Offered annually.

A study of "the science of conduct and character." It will include an introduction to the various systems of ethical theory, an attempt to find a sufficient basis for moral principles, and extended discussion of the application of such principles to life and conduct. Drake, *Problems of Conduct*, has been used as a text book.

135. Introduction to Philosophy. Professor Holmes.

One hour a week, second semester. Offered 1923-24.

Lectures and recitations on some of the fundamental problems of philosophy. It is intended to supply a vocabulary and an interest in the subject which will open the way to further reading or study.

136. History of Science. Professor Holmes.

Two hours a week, first semester. Offered 1924-25.

The beginnings of curiosity and of explanation: the beginnings of organized knowledge. Attainments in science of the ancient nations, and its development down to our time. Sedgwick and Tyler, *History of Science,* has been used as a textbook.

137. Scientific Methods and Results.

Two hours a week, second semester. Offered in 1924-25.

The basic assumptions and logic of science. Methods of observation and experiment. Natural Law; its meaning and value. The general principles accepted in the various sciences, and the open problems: evolution, relativity, electron theory of matter, etc.

138. History of Philosophy. Professor Holmes.

Three hours a week throughout the year. Offered annually.

After a brief introductory glance at the early Greek philosophies, especial attention is given to Socrates and to the systems of Plato and Aristotle. Some time is devoted to the development of philosophical systems in the period centering about the beginning of the Christian era; the growth culmination, and decline of scholasticism, are studied, and the appearance of the modern critical spirit. In the second semester the work is directed to the modern systems. Especial attention is given to the philosophy of evolution. Thilly, *History of Philosophy,* and Cushman, *Beginners' History of Philosophy,* have been used as textbooks.

Open to Juniors and Seniors.

139. General Psychology. Professor Holmes.

Three hours a week during the first semester. Offered annually.

This course aims to introduce the student to the science of psychology through modern experimental methods together with lectures, demonstrations, and clinical observations. It also aims to lay the foundations for more advanced work in psychology and courses in other departments that demand a knowledge of the fundamental principles of mental activity.

Some of the greatest archæological collections of the world are near enough to be made use of by Swarthmore students, and visits to museums, exhibitions, etc., are frequently possible. Especially to be noted is the Archæological Museum of the University of Pennsylvania, with its remarkable collections illustrating the civilizations of Babylonia, Assyria, and Egypt; its display of amulets, charms, etc., from many parts of the world; its Buddhist Temple, and collections of similar materials from among the American Indians, the Esquimaux, and many other peoples.

A Museum of Religions has been started at Swarthmore, which has already a valuable collection of religious curios from China, Japan, India, and elsewhere. Additions to this collection will be welcomed.

Mention should also be made of the great libraries of Philadelphia, and of the lecture courses, often by the great scholars of the world, at Drexel, Franklin, and Wagner Institutes, and at the University of Pennsylvania, in addition to those offered at Swarthmore. The most famous preachers, statesmen, and orators are frequently to be heard in Philadelphia, and the opportunities thus afforded are brought to the attention of students.

Education

The instruction in the Department of Education is under the direction of Professor W. Carson Ryan, Jr. Miss Edith Everett and Dr. Arthur W. Ferguson are lecturers in education.

Courses in this Department are designed to meet the need of two groups of students: (1) Those who, while not intending to teach, desire, as citizens and workers in other fields, to know something of the current conditions and problems of American education; (2) those who wish to prepare for teaching.

Course 140, the introductory course in education, is intended to meet the needs of both groups by furnishing a general survey of the field. The remaining courses are designed mainly for those who plan a teaching career, but they are open to mature students interested in education, regardless of whether they expect to teach or not. The courses are arranged to meet the new (1922) requirements of the Pennsylvania Provisional College Certificate, which are representative of requirements in the more progressive States. Eighteen hours in education are required for this Certificate, twelve prescribed and six elective. The twelve prescribed hours are covered by the following Swarthmore courses: Introduction (140), 3 hours; Educational Psychology (141), 3 hours; Laboratory Teaching (146), 6 hours. The six hours of electives may be taken from any other education courses offered in Swarthmore College, including teachers' courses given by other departments. It is expected that students will take general psychology (139), before educational psychology (140). Students in honors courses planning to teach should have taken Education 140 and 141 in the sophomore year and should plan for Education 146 in the senior year with the remaining six hours to be arranged.

The College has a Teachers' Appointment Committee, of which Professor Ryan is chairman. The Committee assists graduates of the College in securing teaching positions, and its services are available for earlier graduates of the College as well as for members of the graduating class.

COURSES OF INTRUCTION

140. Education, Introductory Course. Professor Ryan.

Three hours a week during the first semester.

This is a general course covering the field of education from the point of view of the citizen. For students intending to teach or attempting to choose a vocation, it furnishes an introduction to the career of teaching. For the student who does not intend to teach it offers a survey of current educational conditions and problems in their relation to present world situations. National, state and local provision for education; public and private schools; health education; vocational education and guidance; rural education; adult education; progressive education; school organization and control, and school finance, are some of the topics treated.

141. Educational Psychology. Professor Ryan.

Three hours a week during the second semester.

This course treats of psychology in its application to education. The main topics considered are individual differences, inheritance of mental traits, measurement of intelligence, rate and progress of learning, transference of training, psychology of school subjects.

142. Secondary Education. Miss Everett.

Two hours a week during the first semester.

The aims and organization of secondary education, with special emphasis on the place of each of the high school subjects.

143. Elementary Education. Miss Everett.

Two hours a week during second semester.

A brief survey of the aims, content, and methods of elementary education, with special reference to reorganization of elementary and secondary education.

144. History of Education. Dr. Ferguson.

Two hours a week throughout the year.

The modern period, from 1789 to the present, is considered during the first semester; the second semester is given to the earlier beginnings. In the first semester the general topics include the beginnings of national education in France, Germany, England, and the United States; the American battle for free schools; new theory and subject matter of education; current tendencies and expansions. The work of the second semester covers Greek and Roman education, the contribution of Christianity, education in the mediæval world; the revival of learning, the reformation and education, scientific method and the schools. Lectures, discussions, outside reading. Either half of the course may be taken separately.

145. Educational Measurement. Professor Ryan.

Two hours a week during second semester.

A detailed study of tests and scales in current use. (Not given in 1924-25.)

146. Laboratory Teaching.

Three hours a week throughout the year.

Visits, intensive observation, and teaching, with one weekly conference hour. This is the Senior course for teachers. Emphasis in observation and participation in the case of each member of the course will depend upon the type of teaching which the

student expects to enter. Students planning to teach elementary grades will have opportunity to observe and teach in this field, but will be held for additional work sufficient to satisfy state requirements for elementary teaching.

147. School Administration. Professor Ryan.

Two hours a week during first semester.

This course deals with the problems of organization, administration, and supervision of elementary and secondary schools in city, county and state. (Not given in 1924-25.)

148. Social Work and the School. Miss Everett.

Two to four hours a week through the year.

This course is given in co-operation with the Department of School Counseling and Training of The White-Williams Foundation of Philadelphia. It consists of at least one half-day each week of supervised field work with the counselors in the public schools; and a fortnightly conference with the Supervisor of the Department for discussion of particular problems and interpretation of the work. The aim of the course is (1) to enable those who intend to be teachers to enter teaching with an understanding of some of the social causes of school difficulties, and some knowledge of social resources, and (2) to give those students who are interested in social work as a profession an opportunity to get a brief practical contact with one kind of social case work.

Open only to Juniors and Seniors.

149. Special Topics in Education. Professor Ryan.

Two hours a week throughout the year.

An opportunity will be offered for advanced students to carry on investigation of special topics in the field of education. Some of the topics studied in recent years have been: English in the high school; rural schools; the platoon school plan; kindergarten and pre-school education; the teaching of French; the place of mathematics in education; measurement in high school English; tests and measurements in junior high school; biology and education; the play movement in education; education in the American dependencies.

TEACHER'S COURSES GIVEN BY OTHER DEPARTMENTS

78. Teachers' Course in Latin. Assistant Professor Brewster.

Two hours a week throughout the year. Offered annually.

Lectures and reports upon the text of Cæsar, Cicero, Virgil, and other Latin authors commonly read in secondary schools.

Prerequisites: Latin 72a, 72b, 73a, 73b, 75, 76; two courses in Education for those who wish credit in Education.

98. Teachers' Course in History. Professor Hull.

One or two hours' credit for each semester. Offered annually.

This course is designed for Senior majors in the Department of History, and is intended to give the theory and practice of aids, methods, and aims in the teaching of history.

Fine Arts

PROFESSOR ALFRED M. BROOKS

The purpose of the courses is to lead to and increase understanding of the Fine Arts. The work consists of illustrated lectures on the plastic and graphic arts: architecture, sculpture, painting, and the allied arts, together with collateral reading and first-hand examination of objects of art. The principles of art and their application in masterpieces are studied not only with reference to the intrinsic value of the masterpieces but with a view to developing good taste, for it is by knowledge and memory of fine things only that power can be acquired to fix the standards by which to form such taste.

Graphic Arts. Study of drawing as the foundation of all the pictorial arts, together with special consideration of painting, engraving and etching. Three hours a week throughout the year. Not open to Freshmen.

Introduction to the Fine Arts. A general course on the significance and history of Art, covering architecture, sculpture, painting and the allied arts. Three hours a week throughout the year.

Greek and Roman Architecture. Study of classic architecture. Three hours a week, first semester.

Mediæval and Renaissance Architecture. Study of the influence of and changes wrought on classic architecture throughout the middle ages and Renaissance down to the present time. Three hours a week, second semester.

Art and Taste. Study of the principles of design with special reference to house furnishing. The aim of this course is to discover how the principles are applied in some of the acknowledged masterpieces of art, and to consider their possible application to personal and present ends. One hour a week, first semester.

Dante. Study of the Divine Comedy as a work of consummate literature. Special attention is given to the life and art of the Italian thirteenth century that produced it. Three hours a week throughout the year.

Biology

The instruction in this department is under the direction of Spencer Trotter, M.D. Dr. Samuel Copeland Palmer is Associate Professor.

The courses in Biology are designed to give a broad view of the facts of life as part of a liberal education. The successful completion of the several courses for the degree of A.B. is preparatory to the study of Advanced Biology, Medicine, Forestry, or of Agriculture. Students are thus enabled to enter the technical schools of the leading universities in the above named branches.

Courses in both Physics and Chemistry are required as entrance by the medical schools.

The courses are arranged so as to present a logical sequence throughout the four years of college work for students making Biology their major subject.

Students making Biology their major will be required to take one year of Chemistry or Physics, and the equivalent of two college years in a modern language.

The requirement by the foremost medical schools of the country of two years' preparation in Biology is fulfilled by these courses in Swarthmore College.

These courses likewise lead to the post-graduate work of the university.

The Academy of Natural Sciences, Logan Square, Philadelphia, affords valuable matter for study and reference both in its collections and library. The museum of the Wagner Free Institute of Science, Seventeenth Street and Montgomery Avenue, Philadelphia, contains valuable aids to study. The Library of the University of Pennsylvania, and the Philadelphia Library, corner Locust and Juniper Streets, are available for consultation and research. The Wistar Institute of Anatomy, Thirty-sixth Street and Woodland Avenue, contains valuable material for study in connection with the pre-medical courses.

PLAN OF STUDY FOR MAJOR STUDENTS

Freshman or Sophomore	155. General Zoölogy, one year, six hours.
	156. General Botany, one year, six hours.
Sophomore	157. (*a*) Physiology, first semester, two hours.
	157. (*b*) Biology in Relation to Disease, second semester, two hours.
Junior	161. Advanced Biology, one year, six hours.
	163. Genetics and Eugenics, one year, four hours.
Senior	162. Embryology, one year, six hours.
	165. Anthropology, two hours.
	166. Human Anatomy, one year, six hours.

Total number of hours for Major—minimum, thirty hours.

155. General Zoölogy. Professor Trotter.

Three hours a week throughout the year. Offered annually.

Open only to Freshmen or Sophomores. Class limited.

156. General Botany. Professor Palmer.

Three hours a week throughout the year. Offered annually.

Open only to Freshmen or Sophomores. Class limited.

157. (*a*) Physiology. Professor Trotter.

Two hours a week during first semester. Offered annually.

157. (*b*) Biology in Relation to Disease (Microbiology). Professor Palmer.

Two hours a week during second semester. Offered annually.

161. Advanced Biology. Professors Trotter and Palmer.

Open to Juniors and Seniors for advanced special work.
Hours to be arranged with professor.

162. Embryology. Professor Palmer.

Three hours a week throughout the year. Offered annually.

Open only to Juniors and Seniors majoring in Biology.

163. Genetics and Eugenics. Professor Palmer.

Two hours a week throughout the year. Offered annually.

164. General Bacteriology. Professor Mercer and Miss Ruch.

Open to a limited number of students in connection with Course 157 (b).

165. Anthropology. Professors Trotter and Speck.

Two hours a week throughout the year.

166. Human Anatomy. Professor Trotter.

Three hours a week throughout the year. Offered annually.

Open only to Pre-medical students in Senior year.

170. Geology. Professor Trotter.

Two hours a week throughout the year.

Open to students above Freshman class.

Chemistry and Chemical Engineering

The instruction in this department is under the direction of Professor Gellert Alleman. Dr. H. Jermain Creighton is Associate Professor of Chemistry, and Dr. Hermann Bernhard is Instructor in Chemistry.

This department does not aim to develop specialists in any particular branch of chemistry, but presents opportunities for a comprehensive general training in this science.

The successful completion of the courses in Chemistry will enable the student to enter upon graduate work at any leading university, or will be of material assistance to him in various technical pursuits in which he may be engaged. Those intending to prepare for the medical profession will find it advantageous to follow several of the elementary courses here offered

The new and commodious chemical laboratory, with its splendid equipment, lends every advantage to thorough and modern instruction in this department.

Students who major in Chemistry and Chemical Engineering must have a reading knowledge of German before entering upon the chemical work pursued during the third year. They should also be thoroughly familiar with elementary mathematics.

The course in Chemistry, as Applied Science, is prescribed for the first and second years. The course in Chemical Engineering is prescribed for four years.

Students may major in Chemistry, in a course in Arts, requiring 124 hours for graduation; in Chemistry, as Applied Science, requiring 132 hours for graduation; in Chemical Engineering, requiring 140 hours for graduation.

171. General Inorganic Chemistry. Professor Alleman, Associate Professor Creighton, and Dr. Bernhard.

Three hours a week throughout the year. Offered annually.

Lectures, demonstrations, written exercises, individual laboratory practice, and weekly conferences on the general principles involved in elementary chemistry. This course includes work similar to that outlined in Smith, *College Chemistry*.

In the laboratory each student performs about two hundred experiments which are selected from Smith, *Laboratory Outline of General Chemistry*. Credit in this course is not assigned until the completion of the entire course at the end of the year.

172. Qualitative Analysis. Associate Professor Creighton.

Three hours a week throughout the year. Offered annually.

The theory and practice involved in the detection of the chemical elements. Special attention is paid to the application of the electrolytic dissociation theory to analysis, and the metallic and nonmetallic elements are studied more fully than in Course 171. Demonstrations, conferences, and individual laboratory work. The textbooks used are A. A. Noyes, *Qualitative Analysis,* and Talbot and Blanchard, *Electrolytic Dissociation Theory;* Baskerville and Curtman, *Qualitative Analysis,* is also recommended. During the second semester, students make Quantitative determinations of a number of typical ions and become familiar with the elementary principles of Quantitative Analysis.

The equivalent of nine hours of laboratory work per week through the year, carrying a credit of three hours for each semester. Credit in this course is not assigned until the completion of the entire course at the end of the year. Prerequisite, 171.

173. Elementary Quantitative Analysis. Professor Alleman and Dr. Bernhard.

Three hours a week during one semester. Offered annually.

Complete analysis of potassium chloride, copper sulphate, calcite, haematite, apatite, sphalerite, clay, Portland cement, and coal.

For students taking Engineering as their major subject. Nine hours of laboratory work per week throughout one semester, carrying a credit of three hours. The time is arranged to suit individual requirements. Prerequisite, 172.

174. Quantitative Analysis. Professor Alleman.

Three hours a week throughout the year. Offered annually.

Demonstrations and laboratory work involving methods in gravimetric and volumetric analysis.

Required of students who select Chemistry as their major subject; open as an elective to all others who have taken Courses 171 and 172 at this institution, or their equivalent elsewhere. The equivalent of nine hours of laboratory work per week throughout the year, carrying a credit of three hours for each semester. The time is arranged to suit individual requirements. Prerequisite, 172.

175. Advanced Quantitative Analysis. Professor Alleman.

Three hours a week during the second semester. Offered annually.

Examination of foods and food products, and their adulterants. Work in toxicology, analysis of sewage, and the sanitary analysis of water.

Required of students who select Chemistry as their major subject; open as an elective to all other students who have had sufficient knowledge of chemistry to follow the course. The work on sewage and water analysis is particularly adapted to students in engineering. The equivalent of nine hours of laboratory work per week during the second semester, carrying a credit of three hours. The time is arranged to suit individual requirements. Prerequisite, 174.

176. Physical Chemistry. Associate Professor Creighton.

Three hours a week during the second semester. Offered annually.

Lectures and laboratory work. The work covered in the lecture course includes the thermodynamic laws; the gaseous, liquid, and solid states of matter; physical mixtures; the theory of dilute solutions; modern theory of the structure of matter; the kinetic theory of gasses; the relation between chemical structure and physical properties; chemical statics and dynamics; and thermo-chemistry. Stress is laid on the applications of thermodynamics to chemical processes. In the laboratory students make observations on the behavior of solutions, determine molecular weights by physical methods, measure velocities of reactions and familiarize themselves with the use of the refractometer, the spectroscope; and the polariscope. The following books are recommended: Nernst,

Theoretical Chemistry; Noyes and Sherrill: *Physical Chemistry;* Getman, *Outlines of Theoretical Chemistry;* Findlay: *Practical Physical Chemistry.*

Two lectures and three hours per week of laboratory work. Required of students who select chemistry as their major study. Prerequisites, 174 and 272.

177. Organic Chemistry. Professor Alleman and Dr. Bernhard.

Three hours a week throughout the year. Offered annually.

Lectures, demonstrations, written exercises, and laboratory work. This course includes the work as outlined in Remsen, *Organic Chemistry.* In the laboratory, students make and study the various organic preparations as given in Remsen, *Organic Chemistry.*

Required of all students who select Chemistry as their major subject.

178. Organic Chemistry (Advanced Course). Professor Alleman and Dr. Bernhard.

A continuation of Course 177. Lectures and laboratory work. In the laboratory, students make all the preparations (not previously made in Course 177), as given in Gattermann, *Praxis des Organischen Chemikers.* A knowledge of German is required.

Required of all students who select Chemistry as their major subject.

180. Electro-Chemistry. Associate Professor Creighton.

Three hours a week during the first semester. Offered annually.

Lectures and laboratory work. The lecture course includes the study of electrolysis; the theory of electrolytic dissociations; conductivity of electrolytis; mobility of the ions; application of the law of mass action to electrolytic dissociations; relation between the chemical structure and the dissociation constant; homogenous equilibria; ionic product and the heat of dissociation of water; hydrolysis; theory of neutralization indicators; amphoteric electrolytis; heterogeneous equilibria; electrolytic dissociation in non-aqueous solutions; electromotric force and concentration cells; polarization and decomposition voltage; industrial electro-chemical process. The laboratory work in this course is arranged so that the student may obtain exact practical information regarding the application of electricity to chemical manufacture, and become proficient in the measurement of electrical conductivities and electromotive forces, and in making electro-chemical analyses. The laboratory course also includes the testing of Faraday's laws and the measurement of transport numbers, the absolute migration velocity of ions, decomposition voltage and heat of neutralization. The following textbooks are recommended: Creighton and Fink, *Principles and Applications of Electrochemistry;* Le Blanc, *Textbook of Electro-Chemistry;* Perkin, *Practical Methods of Electro-Chemistry;* Fisher, *Praktikum der Elektrochemie,* and Smith, *Electro-Chemical Analysis.*

Required of all students who select Chemistry as their major subject; open as an elective to all other students who have a sufficient knowledge of chemistry and of physics to follow the course. Prerequisite, 174 and 176.

The number of students in this course is limited to six.

181. Assaying. Professor Alleman.

One hour a week during the first semester. Offered annually.

Fire assays of ores of gold, silver, lead, zinc, copper, and of numerous metallurgical products. The textbook used is Furnam, *Practical Assaying.*

Three hours of laboratory work per week during the first semester, carrying a credit of one hour.

182. Mineralogy. Professor Alleman.

Two hours a week during the second semester. Offered annually.

This course consists of lectures on crystallography and descriptive mineralogy; and the determination of minerals by the blow-pipe. Moses and Parsons, *Mineralogy, Crystallography and Blow-pipe Analysis,* is used as a guide. Prerequisite, 170.

183. Physical Chemistry (Advanced Course). Associate Professor Creighton.

One hour a week during the first semester. Offered annually.

A continuation of Course 176.

185. Engineering Chemistry. Associate Professor Creighton.

Three hours a week throughout the year. Offered annually.

This course is for engineering students only. Lectures and laboratory work. Brief courses in the theory and practice of qualitative and quantitative analysis. The work covered in the lecture course includes the chemistry of materials and a brief survey of some of the applications and engineering problems of chemistry. Prerequisite, 171.

Chemical Engineering

The extensive demand made on the part of various industries for men trained both in Engineering and Chemistry, has influenced the establishment of a course which will afford preparation along these special lines. The course, as arranged, includes all the prescribed work required for the degree of A.B. Ample opportunity is also afforded the student in the choice of elective studies. The course, faithfully followed, will give the student a liberal education, and, in addition, special training in Chemical Engineering. The course as outlined follows:

FRESHMAN YEAR

Thirty-five "hours" of prescribed work.
See Uniform Curriculum on page 54.

SOPHOMORE YEAR

Thirty-seven "hours" of prescribed work.
See Uniform Curriculum on page 55.

JUNIOR YEAR

COURSE IN CHEMICAL ENGINEERING—JUNIOR YEAR

See Page	*First Semester*		Hours per Week: Class	Lab'y	Credits
123	Physics **272**	Advanced Physics	2	3	3
73	German		3	—	3
	or				
69	French		—	—	—
95	Chemistry **174**	Quantitative Analysis	—	9	3
96	Chemistry **177**	Organic Chemistry	2	3	3
78	History		—	—	—
	or				
83	Economics **111**	Elementary Economics and Railroad Transportation	3	—	3
	or		—	—	—
90	Political Science		2	—	2
116	Electrical Engineering **237**	Direct Current Theory	—	3	1
116	Electrical Engineering **238**	D. C. Lab			
		Totals	12	18	18

Second Semester

116	Electrical Engineering **238**	Direct Current Laboratory	—	3	1
116	Electrical Engineering **237**	Direct Current Theory	2	—	2
73	German		3	—	—
	or				
69	French		—	—	3
95	Chemistry **174**	Quantitative Analysis	—	9	3
96	Chemistry **177**	Organic Chemistry	2	3	3
78	History		—	—	—
	or				
83	Economics **111**		—	—	3
	or		—	—	—
80	Political Science		—	—	2
	Elective				
		Totals	7	15	17

SENIOR YEAR

COURSE IN CHEMICAL ENGINEERING—SENIOR YEAR

See Page	*First Semester*		Hours per Week: Class	Lab'y	Credits
96	Chemistry 180	Electro Chemistry	2	3	1
96	Chemistry 181	Assaying	—	3	3
83	Economics 111 or 112 or 113		3	—	3
	or				
78	History		—	—	—
	or				
80	Political Science		—	—	—
96	Chemistry 178	Adv. Organic Chemistry	2	3	3
74	German 49 or Elective	Scientific German	2	—	2
	Elective		1	—	1
63	English 4 (a)	Special Readings	2	—	2
85	Religion and Philosophy 131		2	—	2
		Totals	15	9	17

Second Semester

115	Engineering 232	Experimental Laboratory	—	4	2
83	Economics 111		3	—	3
	or				
78	History		—	—	—
	or				
80	Political Science		—	—	—
96	Chemistry 178	Adv. Organic Chemistry	2	3	3
85	Religion and Philosophy 131	Bible Study	1	—	1
	Thesis (Chemical)	Laboratory Research	—	12	4
63	English 4 (a)	Special Readings	2	—	2
		Totals	8	19	15

ENGINEERING

Civil, Mechanical and Electrical

The Division of Engineering includes the three Departments of Civil, Mechanical and Electrical Engineering.

The instruction in the Department of Electrical Engineering is under the direction of Dr. Lewis Fussell, Professor of Electrical Engineering. Professor Weston E. Fuller is in charge of the Department of Civil Engineering. Assistant Professor Charles G. Thatcher is head of the Department of Mechanical Engineering. Mr. Howard M. Jenkins is Instructor in Electrical Laboratory. Mr. E. W. Doebler is Instructor in Civil Engineering. Mr. Andrew Simpson is Instructor in Mechanical Engineering. Mr. S. W. Johnson is Lecturer in Engineering Accounting. For the year 1924-25, Professor Fuller is Chairman of the Division.

The courses in Engineering are designed to train men in the fundamental principles that underlie the branch in which they are majoring, and to give such engineering and practical work as time and equipment will permit.

The location of the College near Philadelphia, and the important manufacturing centers in its vicinity, enables students to visit a great variety of industrial and engineering works.

The success of an engineer has come more and more to depend upon his ability to meet men of education and culture on equal terms; hence, courses in liberal arts are carried throughout the four years, in the belief that they will ultimately benefit the students. The technical courses of study are arranged and conducted with the purpose of imparting preparation for immediate usefulness in the office, drafting room or field, as well as to give a sound foundation for more advanced work. Undergraduates are encouraged to engage in engineering work during the summer vacation.

Engineering Equipment

The equipment for surveying is complete and up to date, including compasses, transits, solar attachments, dumpy and wye levels.

The equipment for experimental work in the Material Testing Laboratory includes the following main units:

100,000 lbs. Olsen Tension Machine; 15,000 lbs. Olsen Tension Machine; 50,000 in. lb. Olsen Torsion Machine; Upton-Lewis Fatigue Testing Machine; White Souther Endurance Testing Machine; Fairbanks Cement Testing Machine; Olsen Cement Testing Machine; Shore Scleroscope; Brinnell Hardness Testing Machine; Stewart Heat Treatment Furnace.

There is also a complete set of accurate instruments for measuring sizes and deformation of test pieces.

The Hydraulic Laboratory contains at present:

125-gallon d'Olier Volute Pump; Gould Triplex Geared Pump; 12" Pelton Impulse Wheel; 6" Trump Reaction Turbine; Nash Centrifugal Pump with Electric Dynamometer; Weirs, nozzles and Venturi tubes for measurement of hydraulic flow.

The Steam Engine Laboratory has the following main units:

10" x 24" Wetherill Corliss Engine; 8" x 13" x 10" Ideal Tandem Compound Engine; 7½ KW G. E. Curtis Turbine; Wheeler Surface Condenser; 6" x 8" Horizontal Slide Valve Engine.

The engines and turbines are fitted so as to run either condensing or non-condensing, and there is a complete set of necessary equipment for testing.

In the line of Internal Combustion Engines, there are:

40 H.P. Two-cylinder vertical Bruce Macbeth Gas Engine; 5 H.P. Otto Gas Engine; 25 H.P. Otto Gas Engine; 10 H.P. Quincy Gasoline Engine; 12 H.P. Mietz and Weiss Oil Engine; Rider-Ericsson Hot Air Engine; Essex six-cylinder Automobile Engine with 90 H.P. Sprague Electric Dynamometer.

Particular attention is paid to the testing of fuels and lubricants, for which purpose the following apparatus is available:

Junker Gas Calorimeter; Parr Coal Calorimeter; Standard Universal Viscosimeter; Thurston Friction Testing Machine; Orsat Flue Gas Apparatus; Electric Furnaces and Chemical Balances for Coal and Ash Analysis.

The College power plant is used for study and for testing work. It contains:

Five Return Tubular Boilers of 125 and 150 H.P. capacity; two 75 KW and one 50 KW Harrisburg Engine Generators; also Gas Collectors, Water Meters, Draft Gauges and other necessary testing instruments.

The Electrical Engineering Laboratory occupies the major portion of the second floor of Hicks Hall, and contains equipment for performing experimental work both in alternating and direct currents.

At the western end is a sub-station, for the conversion of alternating current to direct, which supplies the needs of the nearby buildings and furnishes an example of modern practice. There is available 100 K.W. of direct current and 60 K.W. of alternating at a large number of different voltages. The motors, generators, transformers, etc., are set on sixteen low platforms, so arranged as to make easy the connection of apparatus for use. Each table has eight wires, which run through floor ducts to a plug-type switchboard of eight panels, where the individual circuits may readily be connected in series, in parallel or to power.

The following are available for test:

One Motor Generator set, 50 K.W., 125 volt D.C., from 220 volt, 3-phase, 60-cycle; two Motor Generator sets, 25 K.W., 125 volt D.C., from 220 volt, 3-phase, A.C., one Motor Generator set, 2.5 K.W., 10 volts D.C., from 125 volts D.C., one Motor Generator set, 7.5 K.W., 110 volts A.C., 1, 2, or 3-phase, 20-70 cycles from 125 volts D.C., two Rotary Converters, synchronous, 7.5 K.W., 125 volts D.C., from A.C., 1, 2, or 3-phase, 60 cycles; one Rotary Converter, synchronous, 5 K.W., 125 volts D.C., from 2-phase, 60-cycle.

INDUCTION MOTORS.

One 25 H.P., 220 volt, 3 phase, 60 cycle, variable speed; one 7.5 H.P., 220 volt, 3 phase, 60 cycle, variable speed; one 7.5 H.P., 220 volt, 2 phase, 60 cycle, constant speed; one 5 H.P. 110 volt, 3 phase, 60 cycle, constant speed; one 5 H.P., 110 volt, 3 phase, 60 cycle, variable speed; one 2 H.P., 110 volt, single phase, 60 cycle, constant speed; one Synchronous Generator, 7.5 H.P., 220 volt, 1, 2, 3, 6 or 12 phase, 60 cycle; one Induction Potential Regulator, 110 volts input, 20 to 200 volts output; one Synchronous Motor, 25 H.P., 220 volt, 3 phase, 60 cycle.

TRANSFORMERS.

Three 25 KVA, 2200 volts to 220 volts; three 20 KVA, 2200 volts to 220-110-77 volts; one 15 KVA, 2200 volts to 220-110 volts; two 5 KVA, 2200 volts to 220-110 volts; three 1 KVA, 2200 volts to 110-55 volts; two 8 KVA, 110 volts, 2 phase to 110 volts, 3 phase, Scott; two 4 KVA, 110 volts, 2 phase

to 110 volts, 3 phase, Scott; one 5 KVA, 110 volts to 5 volts; one 2 KVA, 110 volts to 40,000 volts; one 3 KVA, street lighting, 6.6 amp.

D. C. Generators.

One 10 KW, 125 volts compound; three 4 KW, 125 volts compound; one 4 KW, 125 volts shunt; one 5 KW, 125 volts compound; one 18 KW, 125 volts compound.

Variable Speed D. C. Motors.

One 2 H.P., 110 volt, 525-2625 rpm., Lincoln type; one 1 H.P., 110 volt, 410-1640 rpm., Interpole; one 27 H.P., 220 volt, 950 rpm; one 30 H.P., 220 volt, 550 rpm.

There is a large number of high-grade ammeters, voltmeters and wattmeters which make it possible to read closely any current from .001 to 1,500 amperes and any pressure from .001 to 3,000 volts. A vibrating reed frequency meter, a synchroscope, a contactor for wave form, a power factor meter, recording and integrating meters are available. A General Electric oscillograph is used to show wave shape and phase relations.

Condensers, inductances, lamps of many types, and the necessary lamp banks, water barrels, rheostats and starting boxes are provided. The department owns and operates a complete radio station, with experimental and amateur licenses known as 3 YJ and 3 AJ.

For the work in illumination there are a Bunsen photometer of semi-portable type, a three-meter Queen photometer with Lummer-Brodhun screen, revolving head, etc., and two portable illuminometers. Many types of lamps and types of glassware are at hand, and a study is made of the various types of lighting around the College to determine where each would be best applied for interior or outdoor work.

SHOP WORK

All engineering students will be required to obtain experience in shop work. Such students as may so desire may do a portion or all of the required work outside of the College. Such work shall be of a nature to be approved by the faculty of the Engineering Division, and shall be general enough to be equivalent to the work required in the College shops. Those students desiring to substitute shop work in factories shall submit their

plan to the faculty for approval prior to doing the work, and shall obtain from a responsible official of the company, in whose factory they have been employed, a certificate of satisfactory work done, in such detail as may be required by the faculty. The amount of time devoted to shop work in the factory shall be at least twice that required in the College shop, and a greater amount of time may be required unless the work is well divided among different branches of shop practice. If the work done outside the College is deemed sufficiently complete to be a satisfactory substitute for a part but not for all of the College course, then the student will be required to take only that portion of the work in College in which his outside experience is considered deficient.

The work in the College shop will be conducted during a period of four weeks immediately preceding or following the College year. The required work will be conducted for a period of four weeks of forty-four hours per week.

The machine shop occupies a large portion of the second floor of Beardsley Hall. It is arranged so that the machine and bench work are entirely separated. A large tool room is centrally located and is in charge of an assistant who supplies individual tools on a check system, as is done in commercial shops.

The machine shop contains an assortment of tools including screw-cutting engine lathes; speed lathes, simple and back-geared; a planer; a complete universal milling machine with milling cutters; a shaper; a twist-drill grinder, and two vertical drill presses; a lathe-center grinder; plain and swivel vises; lathe chucks, universal and independent; also drill chucks, chucks for milling machine and vises for planing; surface plates; standard gauges, and a complete equipment of small tools.

The equipment of the machine shop includes two Hamilton engine lathes, 16 in. by 6 ft.; a Lodge & Shipley lathe, of similar size; a Whitney wet tool grinder, and a 16 in. by 8 ft. Champion engine lathe of rugged design for the demonstration of high-speed cutting tools. The gearing on all lathes is covered by guards or casings to prevent accidents.

The woodworking shop extends through the entire length of

the third floor of Beardsley Hall. All the woodworking machinery is of the latest design, and each unit has a direct motor drive and is equipped with approved safety devices. The equipment includes the following machines:

24-inch Oliver Hand Planer and Jointer; 36-inch Oliver Single Surfaces; 38-inch Oliver Band Saw; Oliver Universal Wood Trimmer; Colburn Universal Circular Saw; Mummert, Wolf and Dixon Oil Tool Grinder; 6-inch Bench type Oliver Hand Jointer; Post Drill Press and Boring Machine; 24-inch Oliver Wood Turning Lathe; eight 12-inch Oliver Motor Head Wood Turning Lathes.

The tool room is equipped with all small tools and necessary stock for a complete course in elementary pattern making and woodworking.

The forge shop. This equipment, on the ground floor of the building, consists of ten fires and one additional master fire. The forges are operated on the down-draft principle, and were designed and constructed for this shop by the Buffalo Forge Company.

The foundry is also located on the first floor, and has a gas-heated cupola or furnace for melting metals in crucibles. The additional equipment consists of moulding benches, flasks and other accessory apparatus.

Fees. A fee of ten dollars for each semester is charged for each course in surveying, mechanical laboratory, electrical laboratory or illumination, and a fee of twenty dollars for the four-week summer course in shop work, and proportionate charge for shorter periods of required work.

The Major in Engineering

Four courses are offered in Engineering, all of which are designed to train men in the fundamental principles and to give as great an amount as possible of practical engineering work.

To those who desire to specialize along a particular branch, there are offered the three courses leading to a degree of A. B. in Electrical, Civil or Mechanical Engineering.

To meet the requirements of students who anticipate entering any line of business in which engineering training will be of

value, but who do not care to specialize, a General Engineering course is offered. The tremendous industrial development of the country has greatly broadened the field for men who have a knowledge of the fundamentals of engineering, creating a demand for managers and executives who combine business and financial ability with engineering knowledge.

A total of 148 credit hours is required for graduation in Civil, Mechanical or Electrical Engineering, and 140 credit hours in General Engineering. Of the nineteen hours of electives in the general course, at least eight must be in engineering.

Honors

A few exceptional students will be given the opportunity to read for honors during their Senior year in the Division of Engineering. A course of reading and study will be assigned in this division along the lines of Civil, Mechanical, Electrical or Administrative Engineering. The first three partake of the nature of more extended investigation along the lines of Civil, Mechanical or Electrical Engineering. Reading for honors in Administrative Engineering will entail a wider study than usual in the work of the Honors Division of Social Science.

Advanced Degrees in Civil, Mechanical, and Electrical Engineering

(See page 61)

COURSE IN ENGINEERING
FRESHMAN YEAR

See Page	*First Semester*		Hours per Week: Class	Lab'y	Credits
119	Mathematics 252	Algebra	3	—	3
119	Mathematics 253 (a)	Trigonometry	2	—	2
69-77	Group 2	Language	3	—	3
62	English 1	Composition	2	—	2
94	Chemistry 171	General Inorganic	2	3	3
113	Engineering 191	Drawing	—	6	2
114	Engineering 223	Surveying	1	3	2
		Totals	13	12	17
	Second Semester				
119	Mathematics 252	Algebra	2	—	2
120	Mathematics 254	Analytic Geometry	3	—	3
69-77	Group 2	Language	3	—	3
62	English 1	Composition	2	—	2
94	Chemistry 171	General Inorganic	2	3	3
113	Engineering 193	Descriptive Geometry	—	6	2
113	Engineering 200	Principles of Manufacturing	—	3	1
66	English 17	Extemporaneous Speaking	1	—	1
		Totals	13	12	17

COURSE IN ENGINEERING
SOPHOMORE YEAR

See Page	*First Semester*		Hours per Week: Class	Lab'y	Credits
120	Mathematics 255	Differential Calculus	3	—	3
120	Mathematics 259	Solid Analytic Geometry	2	—	2
69-77	Group 2	Language	3	—	3
123	Physics 271	Engineering Physics	3	—	3
97	Chemistry 185	Engineering Chemistry	1	6	3
114	Engineering 213	Materials	2	—	2
113	Engineering 195	Machine Design	—	6	2
		Totals	14	12	18
	Second Semester				
120	Mathematics 256	Integral Calculus	3	—	3
120	Mathematics 257	Analytic Mechanics	3	—	3
69-77	Group 2	Language	3	—	3
123	Physics 271	Engineering Physics	2	3	3
97	Chemistry 185	Engineering Chemistry	1	6	3
115	Engineering 234	Elements of Electrical Engineering	2	—	2
113	Engineering 201	Mechanics Problems	—	3	1
		Totals	14	12	18

NOTE:—All students majoring in Engineering will be required to have 5 credits in shop work, and 1 credit in the Long Survey, making a total of 148 hours credit for Civil, Electrical and Mechanical Engineers, and 140 for majors in General Engineering.

COURSE IN CIVIL ENGINEERING

JUNIOR YEAR

See Page	*First Semester*		Hours per Week		
			Class	Lab'y	Credits
123	Physics 272	Engineering Physics	3	3	4
114	Engineering 215	Mechanics of Materials	4	—	4
113	Engineering 202	Mechanics Problems	—	3	1
115	Engineering 235	Electrical Machinery	2	—	2
116	Engineering 236	Electrical Machinery Lab.	—	3	2
115	Engineering 226	*Railroads	2	3	3
	Elective		—	—	2
		Totals	11	12	18
	Second Semester				
115	Engineering 225	Hydraulics	4	—	4
113	Engineering 203	Hydraulics Problems	—	3	1
115	Engineering 235	Electrical Machinery	2	—	2
116	Engineering 236	Electrical Machinery Lab.	—	3	2
114	Engineering 212	Heat Engines	2	3	3
114	Engineering 218	Experimental Laboratory	1	3	2
115	Engineering 227	*Municipal Engineering	2	—	2
	Elective		—	—	2
		Totals	11	12	18

COURSE IN CIVIL ENGINEERING

SENIOR YEAR

See	*First Semester*		Hours per Week		
			Class	Lab'y	Credits
63	English 4 (a)	Special Readings	2	—	2
113	Engineering 208	Accounting	3	—	3
113	Engineering 199	Bridge Design	2	—	2
114	Engineering 216	Power Plants	3	—	3
114	Engineering 220	Experimental Laboratory	—	3	2
115	Engineering 229	*Highway Engineering	2	—	2
	Elective		—	—	4
		Totals	12	3	18
	Second Semester				
63	English 4 (a)	Special Readings	3	—	3
113	Engineering 208	Accounting	3	—	3
114	Engineering 209	Engineering Economies	2	—	2
113	Engineering 198	Structural Design	—	6	2
115	Engineering 228	*Concrete	2	—	2
	Elective		—	—	6
		Totals	10	6	18

* Railroads, Course, 226, and Highway Engineering, Course 229, will be offered alternate years to junior and senior students, first semester. Municipal Engineering, Course 227, and Concrete, Course 228, will be offered alternate years to junior and senior students, second semester.

COURSE IN MECHANICAL ENGINEERING

JUNIOR YEAR

See Page	*First Semester*		Hours per Week: Class	Lab'y	Credits
123	Physics 272	Engineering Physics	3	3	4
114	Engineering 215	Mechanics of Materials	4	—	4
113	Engineering 202	Mechanics Problems	—	3	1
116	Engineering 237	Direct Current Theory	2	—	2
116	Engineering 238	Direct Current Laboratory	—	3	2
	Elective		—	—	5
		Totals	9	9	18

Second Semester

115	Engineering 225	Hydraulics	4	—	4
113	Engineering 203	Hydraulics Problems	—	3	1
116	Engineering 237	Direct Current Theory	2	—	2
116	Engineering 238	Direct Current Laboratory	—	3	2
114	Engineering 218	Experimental Laboratory	1	3	2
114	Engineering 212	Heat Engines	2	3	3
	Elective		—	—	4
		Totals	9	12	18

COURSE IN MECHANICAL ENGINEERING

SENIOR YEAR

See Page	*First Semester*		Hours per Week: Class	Lab'y	Credits
63	English 4 (a)	Special Readings	2	—	2
113	Engineering 208	Accounting	3	—	3
114	Engineering 216	Power Plants	3	—	3
114	Engineering 220	Experimental Laboratory	—	3	2
116	Engineering 240	Alternating Current Theory	3	—	3
116	Engineering 241	Alternating Current Lab.	—	3	2
113	Engineering 197	Plant Design	—	6	2
	Elective		—	—	1
		Totals	11	12	18

Second Semester

63	English 4 (a)	Special Readings	3	—	3
114	Engineering 209	Engineering Economics	2	—	2
113	Engineering 208	Accounting	3	—	3
114	Engineering 216	Power Plants	3	—	3
114	Engineering 220	Experimental Laboratory	—	3	2
114	Engineering 211	Gas Engines	1	3	2
	Elective		—	—	3
		Totals	12	6	18

COURSE IN ELECTRICAL ENGINEERING

JUNIOR YEAR

See Page	*First Semester*		Hours per Week		
			Class	Lab'y	Credits
123	Physics **272**	Engineering Physics	3	3	4
114	Engineering **215**	Mechanics of Materials	4	—	4
113	Engineering **202**	Mechanics Problems	—	3	1
116	Engineering **237**	Direct Current Theory	2	—	2
116	Engineering **238**	Direct Current Laboratory	—	3	2
116	Engineering **239**	Illumination	1	3	2
	Elective		—	—	3
		Totals	10	12	18
	Second Semester				
115	Engineering **225**	Hydraulics	4	—	4
113	Engineering **203**	Hydraulics Problems	—	3	1
116	Engineering **237**	Direct Current Theory	2	—	2
116	Engineering **238**	Direct Current Laboratory	—	3	2
114	Engineering **218**	Experimental Laboratory	1	3	2
114	Engineering **212**	Heat Engines	2	3	3
117	Engineering **246**	Conference	1	—	1
	Elective		—	—	3
		Totals	10	12	18

COURSE IN ELECTRICAL ENGINEERING

SENIOR YEAR

See Page	*First Semester*		Hours per Week		
			Class	Lab'y	Credits
63	English **4** (a)	Special Readings	2	—	2
114	Engineering **216**	Power Plants	3	—	3
114	Engineering **220**	Experimental Laboratory	—	3	2
116	Engineering **240**	Alternating Current Theory	3	—	3
116	Engineering **241**	Alternating Current Lab.	—	3	2
116	Engineering **242**	Central Stations	2	—	2
113	Engineering **208**	Accounting	3	—	3
	Elective		—	—	1
		Totals	13	6	18
	Second Semester				
63	English **4** (a)	Special Readings	3	—	3
114	Engineering **209**	Engineering Economics	2	—	2
113	Engineering **208**	Accounting	3	—	3
116	Engineering **243**	Polyphase Currents	3	—	3
117	Engineering **244**	Polyphase Laboratory	—	3	2
117	Engineering **246**	Conference	1	—	1
117	Engineering **247**	Electric Transmission	2	—	2
	Engineering **249**	Electrical Transients	1	3	2
		Totals	15	6	18

COURSE IN GENERAL ENGINEERING

JUNIOR YEAR

See Page	*First Semester*		Hours per Week: Class	Lab'y	Credits
123	Physics 272	Engineering Physics	3	3	4
114	Engineering 215	Mechanics of Materials	4	—	4
113	Engineering 202	Mechanics Problems	—	3	1
115	Engineering 235	Electrical Machinery	2	—	2
116	Engineering 236	Electrical Machinery Lab.	—	3	2
	Elective		—	—	3
		Totals	9	9	16

Second Semester

115	Engineering 225	Hydraulics	4	—	4
113	Engineering 203	Hydraulics Problems	—	3	1
115	Engineering 235	Electrical Machinery	2	—	2
116	Engineering 236	Electrical Machinery Lab.	—	3	2
114	Engineering 212	Heat Engines	2	3	3
114	Engineering 218	Experimental Laboratory	1	3	2
	Elective		—	—	2
		Totals	9	12	16

COURSE IN GENERAL ENGINEERING

SENIOR YEAR

See Page	*First Semester*		Hours per Week: Class	Lab'y	Credits
63	English 4 (a)	Special Readings	2	—	2
113	Engineering 208	Accounting	3	—	3
114	Engineering 216	Power Plants	3	—	3
114	Engineering 220	Experimental Laboratory	—	3	2
	Elective		—	—	6
		Totals	8	3	16

Second Semester

63	English 4 (a)	Special Readings	3	—	3
113	Engineering 208	Accounting	3	—	3
114	Engineering 209	Engineering Economics	2	—	2
	Elective		—	—	8
		Totals	8	—	16

191. Engineering Drawing.

Six hours during the first semester.

Linear drawing, lettering, model and object sketching of machine parts.

193. Drawing and Descriptive Geometry.

Six hours a week during the second semester. Two hours credit.

Elements of descriptive geometry. Isometric drawing. Empirical design.
Prerequisite, Course 191.

195. Machine Design.

Six hours a week during the first semester. Two hours credit.

Kinematic drawing and elementary machine design.
Prerequisite, Course 193.

197. Plant Design.

Six hours a week during first semester. Two hours credit.

Lectures, drawing-board work and computations involved in design of hydro-electric and steam power plants.

198. Structural Design.

Six hours, second semester. Two hours credit.

Problems in design of structures, dams, plate girders, reinforced concrete, etc.

199. Bridge Design.

Two hours credit, first semester.

Theory of the design of steel bridges.

200. Principles of Manufacturing.

One hour credit, second semester.

A course for Freshman Engineers, consisting of lectures and demonstrations in shop practices. Trips to nearby manufacturing plants.

201. Mechanics Problems.

Problems in motion, work and energy, friction, etc.

202. Mechanics Problems.

Three hours a week, one hour credit, during first semester.

Computations for stresses and design of beams, columns, shafts, etc.

203. Hydraulics Problems.

Computations dealing with hydrostatics and hydrokinetics.

204. Shop.

Four weeks during the summer following either the Freshman or Sophomore year. Five hours credit.

This covers pattern making, forge and foundry, and machine work.

208. Engineering Accounting.

Three hours recitation each semester. Three hours credit.

209. Engineering Economics.

Two hours a week during second semester. Two hours credit.

Contracts, specifications, valuation, rate making. Economics of construction and operation.

211. Gas Engines.

Second semester. Two hours credit.

Theory and laboratory work.

212. Heat Engines.

Two hours recitation, one laboratory period, second semester. Three hours credit.

Elementary thermodynamics of steam and gas engines.

213. Materials of Construction.

Two hours a week during the first semester. Two hours credit.

This course consists of a study of the physical properties and methods of manufacture of the various materials used in engineering construction.

Prerequisite, Course 171.

215. Mechanics of Materials.

Four hours a week during first semester. Four hours credit.

Properties of materials; their action under stress; mechanics of riveted joints; beams and plates in flexure; columns; shafts in torsion; spheres and rollers under compression; combined stresses; stresses and deflections due to sudden loads and impact; internal friction and fatigue of materials. Practical applications of the principles discussed.

Prerequisites, Courses 256, 257 and 271.

216. Power Plants.

Three hours a week during each semester. Three hours credit.

Theoretical and practical consideration of steam power plants.

Prerequisites, Courses 171, 257 and 272.

218. Experimental Laboratory.

One lecture, three hours laboratory a week during tho second semester. Two hours credit.

Testing of various materials of engineering and a study of different types of loading.

Prerequisites, Courses 213 and 215.

220. Experimental Laboratory.

Three hours each semester. Two hours credit.

This course covers laboratory work, recitations and written reports. The course covers calibration of instruments, tests of engines, boilers, pumps and hydraulic equipment, testing of fuels and lubricants.

Prerequisites, Courses 225, 232, and must accompany Course 216.

223. Surveying.

Four hours a week during the first semester. Two hours credit.

Surveying instruments and their adjustment. Practice in chaining, leveling, triangulation, running traverse, taking topography, stadia work, preparation of profiles and maps from field notes.

225. Hydraulics.

Four hours a week during the second semester. Four hours credit.

Hydrostatic pressures; velocity of flow; flow from orifices and tubes, through pipes and flumes, over weirs, in channels and rivers.

Dynamic pressures; water wheels, turbines, pumps.

Prerequisites, Courses 215, 257, 272.

226. Railroads.

Five hours a week during the first semester. Three hours credit.

Theory of location, construction and operation. Field work on preliminary and final surveys. Plans, profiles and estimates for a typical section.

Prerequisites, Courses 223 and 230. Offered alternate years.

227. Municipal Engineering.

Two hours a week during the second semester. Two hours credit.

Water supplies; design, construction and operation of waterworks; pumping filtration; modern sewage practice.

Prerequisite, Course 225. Offered alternate years.

228. Concrete.

Two hours a week during the second semester. Two hours credit.

Properties of materials; methods of construction; theory of reinforced concrete design. Tests and formulas; use of diagrams and tables; design of buildings, bridges, arches, dams.

Prerequisite, Course 215. Offered alternate years.

229. Highway Engineering.

Two hours a week during the second semester. Two hours credit.

Lectures and recitations. A study of present types of pavements and their economy under various conditions. Offered alternate years.

230. The Annual Survey.

One week during the summer following either the Freshman or Sophomore year. One hour credit.

One week of continuous work in surveying and mapping, including the running of levels and of a topographical survey by the stadia method. Required with Course 223.

234. Elements of Electrical Engineering.

Two hours lecture, second semester, Sophomore year. Two hours credit.

An introductory theory course for direct and alternating currents, including a conception and manipulation of the fundamental electrical quantities, solution of circuits, and is a foundation for the study of dynamo-electric machinery. Required of all those majoring in engineering.

235. Electrical Machinery.

Two hours lecture throughout the Junior year. Two hours credit.

A comprehensive course supplementing 234 for all others except those majoring in Electrical or Mechanical Engineering, and required of majors in Civil and Chemical Engineering. Consists of a study of the electrical and mechanical design, characteristics and applications of the more usual types of alternating- and direct-current machines.

Prerequisite, Course 234.

236. Electrical Machinery Laboratory.

Three hours a week throughout the Junior year. Two hours credit.

This laboratory work consists of a series of jobs or problems of a practical nature intended to give a working knowledge of the operation and testing of electrical machinery, including direct current motors and generators, batteries and transmission, alternating current generators, motors, transformers and converters, etc.

Prerequisite, Course 234, and must accompany Course 235.

237. Direct Current Theory.

Two hours a week throughout Junior year. Two hours credit.

A detailed study of the theory of direct currents, direct-current generators, motors and their applications. Required of all majors in Electrical or Mechanical Engineering.

Prerequisite, Course 234.

238. Direct Current Laboratory.

Three hours a week throughout the Junior year. Two hours credit.

This laboratory work consists of a series of jobs or problems of a practical nature intended to give a working knowledge of the construction, operation and testing of direct-current machinery, and includes elementary electrical measurements.

Prerequisite, Course 234, and must accompany Course 237.

239. Illumination.

One hour lecture and three hours laboratory a week for the first semester. Two hours credit.

The theory of light distribution, together with a study of illuminants. Design of lighting systems for particular installations.

240. Alternating Current Theory.

Three hours a week throughout the Senior year. Three hours credit.

The theory of alternating currents, with especial references to single-phase generators, motors and transformers.

Prerequisite, Course 237.

241. Alternating Current Laboratory.

Three hours laboratory a week throughout the first semester. Two hours credit.

A laboratory course consisting of the testing of single-phase instruments, generators, motors, transformers, etc. It includes an elementary investigation of transient phenomena, and is an introduction to polyphase applications.

Prerequisite, Course 238, and must accompany Course 240.

242. Central Stations.

Two hours a week for the first semester. Two hours credit.

A study of the electrical design, installation, equipment and economic operation of central stations.

Prerequisites, Courses 234 and 237.

243. Polyphase Currents.

Three hours a week for the second semester. Three hours credit.

An elementary course in the theory and application of polyphase machinery and appliances.

Prerequisites, Courses 240 and 241.

244. Polyphase Laboratory.

Three hours laboratory a week throughout the second semester. Two hours credit.

A laboratory course in the testing of polyphase motors, generators, converters, and investigations of special systems and pieces of equipment.

Prerequisites, Course 241, and must accompany Course 243.

245. Electric Railways.

Two hours a week for the second semester. Two hours credit.

A study of the equipment and operation of trolley lines and the electrification of steam roads.

Prerequisites, Courses 240 and 241, and must accompany Course 243.

246. Conference and Seminar.

One hour a week for the second semester. One hour credit.

This period will be devoted to the presentation and discussion of papers of research or investigation, and will in many instances be devoted to inspection trips or other methods of information assimilation from outside sources.

247. Electric Transmission.

Two hours a week during the second semester. Two hours credit.

Theory and practical considerations of transmission of electric energy.

248. Communication.

Two hours a week during the second semester. Two hours credit.

This course covers laboratory work, recitations, written reports and problems dealing with modern electric methods of communications. It includes a comprehensive study of systems and apparatus for telegraph and radio, and a more detailed investigation of the principles, apparatus, systems and economics of telephonic communication.

Prerequisites, Course 234 and one semester of either 235 or 237.

249. Electrical Transients.

One hour lecture, second semester, three hours laboratory. Two hours credit.

A lecture and laboratory course in elemental transient phenomena and the application of their principles to commercial quantitative problems. It is based on laboratory work with actual circuits and electrical conditions, utilizing an oscillograph for the permanent record. Prerequisites, Courses 237 and 241.

250. Special Electrical Laboratory.

Hours as arranged.

The above number and title cover such courses in the Department of Electrical Engineering for which an individual demand may arise. These special courses are open to students majoring in Electrical Engineering who are properly qualified in the judgment of the instructor. The number of hours of actual work, the number of hours or credit and the time are arranged with each student personally. The student should become familiar with as much of the literature on the subject on which he is working as possible, and may or may not be required to submit a thesis.

Mathematics and Astronomy

The instruction of this department is under the direction of Professor John A. Miller. Dr. Ross W. Marriott is Associate Professor. Mr. John H. Pitman and Mr. James A. Nyswander are Assistant Professors, and Mr. Dean B. McLaughlin is Instructor. Miss Marjorie Onderdonk is Research Assistant. Mr. Walter A. Matos is Voluntary Observer. Mr. Murat Louis Johnson is Non-Resident Lecturer in Mathematics of Insurance.

The undergraduate courses in Mathematics are designed to meet the wants of students desiring later to do graduate work; to teach mathematics in the preparatory schools; to pursue engineering or other technical courses; to enter professions requiring a knowledge of mathematics, such as actuarial work, statistical work and expert accounting.

The College requirement of six hours of Mathematics for all candidates for graduation may be satisfied by passing three hours of Course 252 and Course 253, or by passing Courses 251 and 253, or by passing six hours of Astronomy. The first of these three alternatives is recommended. Students majoring in Mathematics will take the first year Courses 252 and 253.

The graduate courses are offered in Astronomy. These are flexible, designed to meet the need of the individual student. The equipment of the Observatory is best suited to astronometrical and kindred problems. The various eclipse expeditions from the Observatory have yielded considerable eclipse data.

A description of the instrumental equipment for Astronomy may be found on pages 15 and 16. The teaching staff is at present devoting as much time as is consistent with their teaching duties to studies in stellar parallax with the 24-inch telescope, to photography with the 9-inch doublet, and to the study of eclipses of the sun. Students interested in either of these problems may work with advantage in conjunction with one of the professors. Results of departmental studies are published in the Sproul Observatory publications and in various scientific journals.

The Observatory is open to visitors on the second and fourth

Tuesday nights of each month, except those Tuesday nights that fall in a vacation period. Visitors thus have an opportunity of seeing, in the course of a year, many celestial objects of various types.

A departmental library is located on the first floor of the Observatory. It contains about 2,000 volumes and is sufficiently complete to make it a good working library. It is reasonably supplied with standard treatises, particularly those published in the last two decades. It contains complete sets of nearly all the American mathematical and astronomical periodicals, and sets (some of which are complete; some of which are not) of the leading English, German and French periodicals. This library receives the publications of many of the leading observatories in exchange for the publications of the Observatory.

COURSES IN MATHEMATICS

251. Solid Geometry. Assistant Professor Pitman.

Three hours a week during first semester. Offered annually.

Phillips and Fisher, *Solid Geometry.*

252. Freshman Mathematics. Associate Professor Marriott and Assistant Professors Pitman and Nyswander, and Mr. McLaughlin.

Three hours a week during the first semester, and two hours a week during the second semester. Offered annually.

The fundamental algebraic operations and their laws of combination; development of the function concept; a short review of factoring and simultaneous equations; the transformation theorems; remainder theorems; symmetric functions; binomial theorem; permutations and combinations; series; theory of equations; determinants and elimination. The text is largely supplemented by problems that require the student to set up his own equations. Fine, *College Algebra.*

253. Trigonometry. Associate Professor Marriott and Assistant Professors Pitman and Nyswander, and Mr. McLaughlin.

Three hours a week during second semester. Offered annually.

The trigonometric ratios; reduction of trigonometric identities; solution of trigonometric equations; inverse functions; solution of triangles and use of tables. Palmer and Leigh, *Trigonometry.*

253. (*a*) Trigonometry for Engineers. Mr. McLaughlin.

Two hours a week during first semester. Offered annually.

This course is designed to give students majoring in Engineering the work usually covered in Course 253. These students are required to have satisfied the admission requirements in Plane Trigonometry.

254. Analytic Geometry. Assistant Professor Nyswander.

Three hours a week during the first semester. Offered annually.

Theory of Cartesian and Polar co-ordinates; the straight line; the conic sections; the general equation of the second degree; an introduction to Analytic Geometry of three dimensions. Fine and Thompson, *Co-ordinate Geometry.*

Prerequisites, Courses 252 and 253.

254. (a) Analytic Geometry for Engineers. Mr. McLaughlin.

Three hours a week during second semester. Offered annually.

Osgood and Graustein, *Analytic Geometry.*

Prerequisites, first semester of Course 252 and Course 253 (a).

255. Differential Calculus. Associate Professor Marriott.

Three hours a week during second semester. Offered annually.

A study of text, supplemented by an occasional lecture. Love, *Differential and Integral Calculus.*

Prerequisite, Course 254.

255. (*a*) Differential Calculus for Engineers. Associate Professor Marriott.

Three hours a week during first semester.

Prerequisite, Course 254 (*a*).

256. Integral Calculus. Associate Professor Marriott.

Three hours a week during the first semester. Offered annually.

A study of text, supplemented by lectures. Love, *Differential and Integral Calculus.*

Prerequisite, Course 255.

256. (*a*) Integral Calculus for Engineers. Associate Professor Marriott.

Three hours a week during second semester.

Prerequisite, Course 255 (*a*).

257. Analytic Mechanics. Assistant Professor Nyswander.

Three hours a week during second semester. Offered annually.

Composition and resolution of forces; center of gravity; moments; velocity; acceleration; collision of bodies; the integration of simple equations of motion. One of the purposes of the course is to develop facility in applying mathematical formulæ and methods to the investigation of physical phenomena. Miller and Lilly, *Analytic Mechanics.*

Open to students who have credit in Course 256 or 256 (a).

258. Elementary Functions. Assistant Professor Nyswander.

Two hours a week during first semester. Offered annually.

Prerequisite, Course 254.

259. Solid Analytic Geometry. Assistant Professor Nyswander.

Two hours a week during second semester. Offered annually.

Fine and Thompson, *Co-ordinate Geometry,* supplemented by lectures.

Prerequisite, Course 255.

259. (a) Solid Analytic Geometry. Assistant Professor Nyswander.

Two hours a week during first semester.

Osgood and Graustein, *Analytic Geometry.*

Prerequisite, Course 256 (a).

260. Advanced Calculus. Professor Miller.

Three hours a week during first semester. Offered annually.

Total and partial derivatives; theory of infinitesimals; development of series; definite integrals; approximations. The aim of the course is three-fold; to ground the student in the elementary work which has preceded it; to afford the merest introduction in the theory of functions; and to develop skill in the application of the principles of the Calculus to Geometry, and Mechanics. Osgood, *Differential and Integral Calculus.*

Open to students having credit in 257, 258, and 259.

261. (*a*) The Mathematics of Investment and Insurance. Associate Professor Marriott and Mr. Johnson.

Two hours a week during second semester. Offered annually.

The theory of compound interest; annuities; sinking funds; interest rates; theory of Probability; mortality tables. Completion of this course, Courses 251-256, and an introduction to the theory of Finite Differences should enable the student to proceed with the examinations for admission to the Actuarial Society of America. Skinner, *Mathematical Theory of Investment.*

Prerequisite, Course 252.

265. Differential Equations. Associate Professor Marriott.

Three hours a week during second semester. Offered annually.

A study of ordinary and partial differential equations, with their applications to geometrical, physical, and mechanical problems. Murray, *Differential Equations.*

Prerequisite, Course 256.

266. (*a*) Mathematical Analysis. Associate Professor Marriott.

Three hours a week during first semester, and two hours a week during second semester. Given in 1922-23.

An introduction to higher mathematical analysis, including the number concept from a standpoint of regular sequences; number fields and domains; properties of functions of real and complex variables, linear transformations and collineations; matrices and invariants. The course is intended as a transition from the elementary to the higher mathematics.

Open to Seniors and Graduates majoring in Mathematics.

266. (*b*) Vector Analysis. Associate Professor Marriott.

Three hours a week during first semester. Given in 1920-21.

The method of Gibbs and Heaviside. The operations with Vectors, illustrated by applications to physical problems. Gibbs, *Vector Analysis.*

COURSES IN ASTRONOMY

262. Descriptive Astronomy. Professor Miller.

Three hours a week during the year. Offered annually.

A study of the fundamental facts and laws of Astronomy, and of the methods and instruments of modern astronomical research. The course is designed to give information rather than to train scientists. A study of the textbook will be supplemented by lectures illustrated by lantern slides from photographs made at various observatories. The class will learn the more conspicuous constellations and have an opportunity to see the various types of celestial objects through the telescope. The treatment is non-mathematical. Moulton, *Introduction to Astronomy.*

Prerequisite, *Solid Geometry and Trigonometry.*

263. Practical Astronomy. Assistant Professor Pitman.

Three hours a week during the first semester. Given 1924-25.

Theory and use of the transit instrument; determination of time; the latitude of Swarthmore; theory of the determination of longitude. Intended for students of Astronomy and Engineering and those desiring to take the civil service examinations for positions in the United States Coast and Geodetic Survey.

Prerequisites, Courses 255 and 262.

264. Orbit Computation. Assistant Professor Pitman.

Three hours a week during second semester. Offered 1924-25.

Central orbits; computation of the orbit of a comet or an asteroid. Leuschner's *Short Method;* Tisserand, *Determination des Orbites.*

Open to Seniors and graduates.

267. Method of Least Squares. Assistant Professor Pitman.

Three hours a week during first semester.

The law of errors; the probability curve; adjustment of observations; weights and probable errors. The theory will be applied to practical problems in astronomy. A few supplementary lectures will be given on the methods of interpolation and mechanical quadratures.

Merriman, *Least Squares.*

Open to Juniors and Seniors.

268. Special Courses.

(*a*) Graduate students may work either in Mathematics or Astronomy with one of the professors on any problem on which the professor is working. The student is encouraged to become familiar with the literature of the problem and to ground himself in its fundamental principles.

In astronomy he may participate in actual observations at the telescope; in the measurement of photographic plates; and in the reduction of observations.

The number of hours credit is arranged with each student personally.

(*b*) Undergraduate students may under direction prepare papers upon subjects requiring a rather extensive examination of the literature of a given subject.

268. (*c*) Stellar Parallax: Professor Miller.

The theory of trigonometric parallax. The measurement and reduction of parallax plates. Discussion of errors. The theory of spectroscopic parallaxes. Other methods.

Open to graduate students.

269. Celestial Mechanics. Professor Miller.

Three hours a week during second semester.

Moulton, *Introduction to Celestial Mechanics.*

Physics

The instruction in this department is under the direction of Associate Professor Winthrop R. Wright. Mr. A. H. Croup is is instructor.

The department offers two courses in general physics which are of the same general content and calibre. These courses cover the fundamental principles of the science in their relation to the other sciences and to general experience. The lecture and recitation work is supplemented by experiments for which the laboratory is well equipped.

Advanced courses are offered in special branches of the subject and such changes will be made in these courses from year to year that a student may obtain a comprehensive, though necessarily elementary, view of the domain of modern physics. The department aims to prepare students through these courses for post-graduate study, for research work in industrial laboratories, or for the teaching of physics in secondary schools. For any of these advanced courses a thorough grounding in mathematics and chemistry is essential. An elementary knowledge of the languages is of practical value in physics and a reading knowledge of scientific German should be obtained early.

THE COURSES IN PHYSICS

270. General Physics.

Four hours for the year. Offered annually.

Three recitation periods and one laboratory period each week. This course is not open to majors in Engineering. It is an introductory course of college grade, and, while there is no prerequisite, a familiarity with trigonometry is desirable.

271. Engineering Physics.

Three hours for the year.

272. Engineering Physics.

Four hours for the first semester. Offered annually.

The course in Engineering Physics is a three-semester course in general physics, and is engineering physics only in the sense that it meets the schedule requirements of engineers. The first two semesters are listed as 271 and the third as 272. One laboratory period a week is included during the second and third semesters.

Open to engineering majors only.

273. Electrical Measurements.

Two hours for the second semester. Offered alternate years.

One recitation and one three-hour laboratory period each week. The underlying principles of electrical measurements are presented and their application is shown in the more important laboratory methods. The experiments include the precise measurement of resistance, current, potential difference, quantity, capacity, inductance, and the magnetic properties of iron. Given 1922-23.

Prerequisite, 270 or 272.

274. Atomic Physics.

Two hours for the second semester. Offered annually.

Two lectures each week. The subject includes an elementary discussion of the more prominent developments in physics during the last twenty-five years. It centers around the problem of the constitution of matter and presents the simpler aspects of cathode and Roentgen rays, photoelectricity, thermoelectricity, radioactivity, and spectrum analysis in their bearing on this question.

Prerequisite, 270 or 272.

275. Advanced Physics.

Hours to be arranged.

The above number and title cover such courses in the branches of physics for which the demand arises and the equipment of the department is adequate.

An advanced laboratory course in the use of physical instruments such as resistance theremometers, thermocouples, prism spectrographs, refractometers and similar devices of precision is given during the first semester. This is designed primarily for those who will have use for such instruments in the allied sciences of astronomy, biology, chemistry, and engineering.

These courses are open to students who are properly qualified in the judgment of the instructor.

Physical Education

The Physical Education of the College is under the direction of E. LeRoy Mercer, M.D., Assistant Professor of Physical Education. He is assisted in the courses for men by Mr. Frank Fitts, and for women by Miss Elizabeth Lanning, Miss E. Winifred Chapman and Dr. Jeanette Sherman.

The aim of the department of Physical Education is to promote the general physical well being of the students, and to assist them to gain the hygienic, corrective, and educative effect of rightly regulated exercise.

In order that this object may be better attained, and to assist the director in gaining a definite knowledge of the strength and weakness of the individual, a careful physical examination and medical inspection (eye, nose, and throat) is required, which serves as a basis for the work.

All students must take the prescribed work in Physical Education. It is strongly recommended that, before entering College, each student undergo a thorough visual examination and be fitted with glasses, if there is a need for them.

The Health Laws of the State of Pennsylvania require successful vaccination against smallpox before a person can enter a private, parochial or public school as a student.

For a general statement in regard to the facilities for physical training at Swarthmore see pp. 18-19.

REQUIREMENTS FOR MEN

Two hours a week of regular prescribed work are required of all men in the first and second year classes.

Intercollegiate contests in various athletic and aquatic sports are conducted by the Athletic Association, but under the supervision of the Athletic Committee and the Director of Physical Education, who may at any time forbid any man entering a contest whose physical condition is not satisfactory.

COURSES FOR MEN

1. Physical Education. Dr. Mercer and Mr. Fitts.

Two hours a week throughout the year (two sections).

This course is required of all first-year men, who may elect from the following during the fall months, opening of college to Thanksgiving recess: Football, lacrosse, cross-country, track, and tennis.

Ending of Thanksgiving recess to spring recess: The classes meet in the gymnasium and the work consists of gymnastics and athletics so fitted to the student's life that it will be both beneficial and pleasant.

Ending of spring recess to Commencement, election may be made from the following: Baseball, lacrosse, track, and tennis.

Freshman will be required to attend one swimming period weekly.

2. Physical Education. Dr. Mercer and Mr. Fitts.

Two hours a week throughout the year (two sections).

This course is required of all second-year men. The plan and nature of the work is similar to Course 1, but more advanced.

3. Physical Education. Dr. Mercer.

Juniors and Seniors, one hour each week (optional)

From Thanksgiving recess to the spring recess, gymnastic exercises and recreative games.

4. Hygiene. Dr. Mercer.

One hour a week from Thanksgiving Recess to Spring Recess

This course is required of all first-year men. Offered annually.

REQUIREMENTS FOR WOMEN

One hour of exercise each day except Sunday is required of all resident and non-resident women throughout their college course. For Freshmen, Sophomores, Juniors, and Seniors two of these periods must be taken in supervised class work. On the other days of the week some form of outdoor exercise must be taken. This may be tennis, riding, walking, tramping, or swimming Exceptions to these requirements are made only for physical disability and at the discretion of the college physician, in which case suitable work is prescribed. One period of swimming per week is required of all students except Juniors and Seniors who have passed the required tests.

All gymnastic work, games and swimming are under the personal supervision of the instructor.

First year students are required to attend a course of lectures in Personal and Sex Hygiene, given once a week during the first semester.

Application for information in regard to the regulation costume for athletics and gymnastics should be made to Director of Physical Education of the Women.

COURSES FOR WOMEN

1. (*a*) First Year Hockey. Miss Lanning.
Two periods per week. Fall to Thanksgiving. Offered annually.
Required of first year students.

1. (*b*) First Year Educational Gymnastics. Miss Lanning.
One period per week. Thanksgiving to Spring. Offered annually.
Required of first year students as a continuation of 1 (*a*).
Elementary marching, tactics, calisthenics and games.

1. (*c*) First Year Track and Field Events. Miss Lanning.
Two periods per week. Spring to June. Offered annually.
Elective in place of Courses 15 and 16.

2. (*a*) Second Year Hockey. Miss Lanning and Miss Chapman.
Two periods per week. Fall to Thanksgiving. Offered annually.
Required of second year students.

2. (*b*) Second Year Educational Gymnastics. Miss Chapman.
One period per week. Thanksgiving to Spring. Offered annually.
Required of second year students as continuation of 2 (*a*).
More advanced than course 1 (*b*).

2. (*c*) Second Year Track and Field Events. Miss Lanning and Miss Chapman.
Two periods per week. Spring to June. Offered annually.
Elective in place of Courses 15 and 16.

3. (*a*) Third and Fourth Year Hockey. Miss Chapman.
Two periods per week. Fall to Thanksgiving. Offered annually.
Required of third and fourth year students.

3. (*b*) Third and Fourth Year Educational Gymnastics. Miss Chapman.
One period per week. Thanksgiving to Spring. Offered annually.
Required of third and fourth year students as continuation of 3 (*a*).
More advanced than 2 (*b*).

3. (*c*) Third and Fourth Year Track and Field Events. Miss Lanning and Miss Chapman.
Two periods per week. Spring to June. Offered annually.
Elective in place of Courses 15 and 16.

4. Moderate Gymnastics. Miss Chapman.
One period per week. Thanksgiving to Spring. Offered annually.
For students physically unable to do the full required gymnastic work.

5. Elementary Apparatus. Miss Lanning and Miss Chapman.
One period per week. Thanksgiving to Spring. Offered annually.
Elective with Courses 1 (*b*), 2 (*b*) and 3 (*a*).
Elementary Exercises on horse, parallel bars, buck, flying and traveling rings.

6. Advanced Apparatus. Miss Lanning.

One period per week. Thanksgiving to Spring. Offered annually.

Elective with Courses 1 (*b*), 2 (*b*) and 3 (*a*).

More advanced exercises than Course 5.

7. Elementary Dancing. Miss Lanning.

One period per week. Thanksgiving to Spring. Offered annually.

Elective to all students.

Aesthetic, natural and interpretive dancing.

Members of this class are eligible to participate in the Spring May Dances.

8. Advanced Dancing. Miss Lanning.

One period per week. Thanksgiving to Spring. Offered annually.

Open to students who have an elementary knowledge of dancing.

Aesthetic and advanced folk dancing (More advanced than Course 7).

Members of this class are eligible to participate in the Spring May Dances.

9. Special Corrective Gymnastics. Miss Lanning.

One hour per week. Fall to June.

Advised for students who need special attention because of poor carriage, slight curvations of the spine, etc.

Daily work on the part of the students is in addition to a period once a week with the instructor.

10. First Year Basket-ball. Miss Lanning.

One hour per week. Thanksgiving to Spring. Offered annually.

Open to all first year students.

11. Second Year Basket-Ball. Miss Chapman.

One hour per week. Thanksgiving to Spring. Offered annually.

Open to all second year students.

12. Third and Fourth Year Basket-Ball. Miss Lanning and Miss Chapman.

One hour per week. Thanksgiving to Spring. Offered annually.

Open to all third and fourth year students.

13. Varsity Hockey. Miss Lanning.

Three hours per week. Fall to Thanksgiving. Offered annually.

Required of all members of Varsity Squad instead of Class Hockey.

14. Varsity Basket-ball. Miss Lanning.

Three hours per week. Thanksgiving to Spring. Offered annually.

Required of all members of Varsity Squad instead of Class Basket-ball or Gymnastics.

15. Swimming. Miss Lanning, Miss Chapman, and Assistants.

One period per week throughout the year. Offered annually.

Required of all students, except Juniors and Seniors, who have passed tests.

Ability to swim is part of requirement in Physical Education.

16. Tennis, Hiking and Horseback Riding.

Two periods per week. Fall to Thanksgiving and Spring to June.

Elective in place of Courses 1 (*c*), 2 (*c*), 3 (*c*), and 15.

STUDENTS, 1924-25

UNDERGRADUATE STUDENTS

Name	Major Subject	Address
ADAMS, NAN SMITHAM,	*Social Sciences,*	Nesquehoning.
ALGEO, BRADLEY CANFIELD, JR.,	*Engineering,*	Oreland.
ALTHOUSE, MARY ELIZABETH,	*English,*	Sellersville.
ANDREWS, BRICE FOGG,		Philadelphia.
ANDREWS, MARY KENDERDINE,	*English,*	Philadelphia.
ARENANDER, CARL ALFRED,	*Engineering,*	Newark, N. J.
AYRES, JOHN UNDERWOOD,	*Elect. Engin.,*	Philadelphia.
BACON, THOMAS STERLING,	*Chem. Engin.,*	Wallingford.
BAIRD, HAZEN VIRGIL,	*Civil Engin.,*	Swarthmore.
BAKER, ARTHUR GORHAM,	*Biology,*	Washington, D. C.
BARCLAY, MARJORIE LUCYLE,	*English,*	Mount Vernon, N. Y.
BARCUS, WILLIAM HERMAN,	*Chem. Engin.,*	Darby.
BARR, CAMERON CARDOZA,	*Mec. Engin.,*	Swarthmore.
BARR, ORLANDO NORMAN,	*Economics,*	Gladwyne.
BARRY, JOHN WILSON,	*Economics,*	Aldan.
BARTLESON, ELIZABETH,	*Biology,*	Chester.
BARTLETT, EDWARD TIFFON, JR.,	*Economics,*	Upper Darby.
BATTEN, MAURICE,	*Chemistry,*	Lansdowne.
BATTIN, ELSIE,	*Latin,*	Philadelphia.
BATTIN, ISAAC LUCIUS,	*Mathematics,*	Philadelphia.
BAUM, LEROY GILBERT,	*Engineering,*	Summit, N. J.
BEACH, EDNA GERTRUDE,	*Pol. Science,*	Chester.
BEACH, MARTHA SPURLOCK,	*English,*	Chester.
BEERS, DONALD EDWIN,	*Education,*	Paterson, N. J.
BENNETT, ISABELLE MAY,	*English,*	Montclair, N. J.
BERRY, HAROLD SILVER,	*Chemistry,*	Lansdowne.
BEST, THOMAS G.,	*Economics,*	Medicine Lodge, Kan.
BIDDLE, CAROLINE COOPER,	*History,*	Mount Vernon, N. Y.
BIDDLE, ELIZABETH BROSIUS,	*English,*	Mount Vernon, N. Y.
BISHOP, ELLIS GRAHAM,	*Pol. Science,*	Swarthmore.
BOND, AUDREY SHAW,	*French Honors,*	Swarthmore.
BONNER, ELEANOR,	*Education,*	Washington, D. C.
BOOTH, GEORGE MARTIN,	*Chemistry,*	Plainfield, N. J.
BORNET, JOSEPHINE SCULL,		Bala.
BOWEN, JANET LYLE,	*Pol. Science,*	Philadelphia.
BOWER, RUTH VIRGINIA,		Wilmette, Ill.
BOWERS, DOROTHY DUNN,	*French,*	Lansdowne.
BOWERS, GERTRUDE HAMILTON,	*History,*	Lansdowne.

Name	Major Subject	Address
BRANEN, WILLIAM THOMAS,	*Biology,*	Lewistown.
BRANN, MARGARET HATHEWAY,	*English,*	Piedmont, Calif.
BROCHEREUX, CECILE AMEDEE,	*French,*	Conshohocken.
BROOKS, ELEANOR ELIZABETH,	*English,*	Mount Vernon, N. Y.
BROOKS, ROBERT CLARKSON,	*Philosophy,*	Swarthmore.
BROWN, BRADWAY,	*Economics,*	Moorestown, N. J.
BROWN, DOROTHY WAINWRIGHT,		Lakewood, Ohio
BROWN, MARTHA ENGLISH,	*French,*	Denver, Col.
BROWN, MAY GERTRUDE,	*English,*	Swarthmore.
BROWN, VIRGINIA NEAL,	*History,*	Washington, D. C.
BROWNE, CICELY CUSHMAN,	*Latin,*	Raleigh, N. C.
BUCHANAN, LUCILLE JEANETTE,	*English Honors,*	Philadelphia.
BUCKWELL, CAROLYN COOK,	*History,*	Brooklyn, N. Y.
BURDSALL, BENJAMIN ROGERS,	*Mathematics,*	Port Chester, N. Y.
BURDSALL, ELLWOOD RICHARD,	*Pol. Science,*	Port Chester, N. Y.
BURDSALL, ROBERT HAVILAND,	*Mathematics,*	Port Chester, N. Y.
BURLING, ALICE GERTRUDE,	*English,*	Brooklyn, N. Y.
BURR, MARVIN YARD,	*Mathematics,*	Riverton, N. J.
BURT, DOROTHY ETHEL,	*History,*	Lansdowne.
BUSH, ARCHIBALD GRAHAM,	*Economics,*	Riverton, N. J.
BUSH, VINCENT GILPIN,	*Elect. Engin.,*	Riverton, N. J.
BUTLER, GEORGE VINCENT,	*English,*	Maplewood, N. J.
CAMPION, ANNA LOUISE,	*Mathematics,*	Media.
CARL, KATHARINE CORINNE,	*Education,*	Philadelphia.
CASTLE, ABNER LINCOLN, JR.,	*Economics,*	Wayne.
CHAN, KAM HON,	*Chemistry,*	Hong Kong, China.
CHANDLER, GEORGE KEIGHLEY,	*French,*	Landenberg.
CHAPMAN, CORNELIA VANDERVEER,	*Social Sciences,*	Swarthmore.
CHAPMAN, JAMES WRIGHT,	*Engineering,*	Pleasantville, N. Y.
CHAPMAN, JULIE VANDERVEER,	*English,*	Swarthmore.
CHARRIERE, JEAN,	*English,*	Collingswood, N. J.
CHILD, EDNA MAY,	*Biology,*	Glenolden.
CISNEY, GLADYS,	*English,*	Richmond Hill, N. Y.
CLAYTON, ELIZABETH ELIASON,	*History,*	Middletown, Del.
CLEMENT, FREDRIKA MARTHA,	*Biology,*	Millbrook, N. Y.
CLEMENT, JOHN BERTON,	*Chemistry,*	Trenton, N. J.
CLEVENGER, GENEVIEVE,	*French,*	Winchester, Va.
CLIFF, ALBERT CAIRNS,	*Pol. Science,*	Philadelphia.
CLOTHIER, GEORGE BALL,	*English Honors,*	Wynnewood.
CLOTHIER, LOUIS KETTERLINUS,	*Mathematics,*	Wynnewood.
CLOTHIER, ROBERT BAIRD,	*Engineering,*	Rochester, N. Y.
COALE, SKIPWITH ROBINSON,	*Economics,*	Riverton, N. J.
COCKS, CATHARINE BONNER,	*English,*	Cornwall-on-Hudson, N. Y.
COCKS, MARY ELIZABETH,		Cornwall-on-Hudson, N. Y.

Name	Major Subject	Address
COLES, WILLIAM COLSON, JR.	*Economics,*	Moorestown, N. J.
COLKET, ELIZABETH PAXSON,	*Mathematics,*	Brooklyn, N. Y.
COLKET, JAMES HAMILTON, JR.,	*Elect. Engin.,*	Brooklyn, N. Y.
CONOVER, MYRA,	*Mathematics,*	Collingswood, N. J.
CONRAD, DOROTHEA NEWTON	*English,*	West Chester.
CORNELL, RUTH ELIZABETH,	*Mathematics,*	Wilmington, Del.
CORSE, MARGARET BELL,	*Chemistry,*	Washington, D. C.
COUGHLIN, JOHN JAMES,	*Pol. Science,*	Elizabeth, N. J.
COULTER, INEZ VICTORIA,	*Pol. Science,*	Bellwood.
CREER, FLORENCE RUTH,	*Social Sciences,*	Philadelphia.
CROWL, FRED SHERWOOD,	*Economics,*	Philadelphia.
CUDLIP, CATHERINE ANNE,	*English,*	Iron Mountain, Mich.
DALLAM, JOHN MORTIMER, 3D.	*English,*	Philadelphia.
DAVIS, HOWARD LANGWORTHY, JR.	*Elect. Engin.,*	Glenolden.
DEANE, OLIVE VIRGINIA,	*History,*	Ridley Park.
DEGROOT, JOHN KEED,	*Economics,*	Morristown, N. J.
DELANEY, MARGARET LOUISE,	*English,*	Sayre.
DENKHAUS, WALTER FRED,	*Elect. Engin.,*	Colwyn.
DICKEY, ALICE E.,	*English,*	Washington, D. C.
DONAL, JOHN SCOTT, JR.,	*Elect. Engin.,*	Elkins Park.
DONATH, PAUL FRED,	*Pol. Science,*	Philadelphia.
DOWDY, FRANCES EYSTER,	*Latin,*	Philadelphia.
DRIVER, AGNES JUANITA,	*Social Sciences,*	Harrisburg.
DUDLEY, DONALD GOODNOW,	*Economics,*	Washington, D. C.
DUNHAM, HAROLD HATHAWAY,	*English Honors,*	Dayton, Ohio.
DUNN, JAMES M.,	*Pol. Science,*	Chester.
DUNNELLS, DOROTHY GOULD,	*French,*	Pittsburgh.
DUTTON, JOHN WALTHON,	*Pol. Science,*	Lansdowne.
ECKERD, SAMUEL GODWIN,	*Economics,*	Darby.
EICHE, ROBERT EDWARD,	*English,*	Reading.
ENGLE, EMMA PEASLEE,	*Latin,*	Clarksboro, N. J.
ENGLE, MABEL MILLER,	*Philosophy,*	Lancaster.
ENNIS, RUTH LILLIAN,	*Mathematics,*	Paterson, N. J.
EVANS, ARTHUR HAINES,	*Pol. Science,*	Moorestown, N. J.
EVANS, RUTH ANN,	*English,*	West Pittston.
EWIG, TITUS JOHN,	*Elect. Engin.,*	Morton.
FAIRBANKS, ANTHONY MEAD,	*Elect. Engin.,*	Swarthmore.
FAIRBANKS, CHARLES MIGUEL,	*Mech. Engin.,*	Swarthmore.
FAIRBANKS, EDMUND USINA,	*Elect. Engin.,*	Swarthmore.
FEESER, PAUL EDWARD,	*Elect. Engin.,*	Chester.
FELTER, ESTHER CATHRYNE,	*English,*	Baltimore, Md.
FETTER, THEODORE HENRY,	*Pol. Science,*	Princeton, N. J.

Name	Major Subject	Address
FINK, T. ROSS,	*Economics,*	Washington, D. C.
FISH, MARJORIE,	*Economics,*	Webster Groves, Mo.
FISHER, CHARLES E.	*Chemistry,*	Collingdale.
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SUNDBERG, ANNA BENEDICT,	*Biology,*	New Rochelle, N. Y.
SWARTZLANDER, ELLEN BRYAN,	*Biology,*	Doylestown.
SWOPE, JOHN HENRY,	*Social Sciences,*	Darby.
SYMONS, ROBERT HENRY,	*English,*	Brooklyn, N. Y.

Name	Major Subject	Address
TANNEHILL, ESTHER MERRILL,	*Chemistry,*	Zanesville, Ohio.
TAYLOR, GERTRUDE NAOMI,	*Mathematics,*	West Chester.
TAYLOR, HERBERT K., JR.,	*Economics,*	Elkins Park.
TAYLOR, JONATHAN K.,	*Biology,*	Round Hill, Va.
TERRELLS, MARY HAYDEN,	*History,*	Swarthmore.
TEST, LAURENCE JOSIAH,	*Engineering,*	Moorestown, N. J.
TEST, WILLIAM ROGER,	*Chemistry,*	Moorestown, N. J.
THOENEN, GRACE VIRGINIA,	*English,*	Sistersville, W. Va.
THOMAS, MURIEL I.,	*English,*	Mahanoy City.
THOMPSON, ANN ENTWISLE,		New Kensington.
THOMPSON, JACK,	*Pol. Science,*	Chester.
THOMPSON, LOIS,	*English,*	Washington, D. C.
THOMPSON, RICHARD FAIRCHILD,	*Eng. Honors,*	Mount Vernon, N. Y.
THOMSON, ESTHER MARY,	*English,*	Philadelphia.
THORN, COLUMBUS WILLIAM,	*Elect. Engin.,*	Ridley Park.
TILTON, CHARLES EDWARD,	*English,*	Mount Vernon, N. Y.
TILY, STEPHEN B., JR.,	*Economics,*	Bala-Cynwyd.
TOLLINGER, WILLIAM PRESTON,	*Philosophy,*	Paoli.
TONN, NATALIE ELSA,	*Social Sciences,*	Union Hill, N. J.
TOWNLEY, FREDERICK STANTON,	*Mathematics,*	Newark, N. J.
TOWNLEY, RAYMOND ALBERT,	*Pol. Science,*	Newark, N. J.
TOWNSEND, HARRIET SHEPARD,		Webster Groves, Mo.
TOWNSEND, HENRY LISTER,	*Pol. Science,*	Wallingford.
TRIMBLE, SELDEN Y., JR.,	*Pol. Science,*	Hopkinsville, Ky.
TROY, DOROTHY FLORENCE,	*Eng. Honors,*	Wilmette, Ill.
TURNER, KATHARINE,	*History,*	Brooklyn, N. Y.
TURNER, LYDIA PARRY,	*Pol. Science,*	Swarthmore.
UNGER, JACOB PAXTON,	*English,*	Indianapolis, Ind.
URDAHL, VALESKA,	*Mathematics,*	Philadelphia.
VANBRAKLE, ELIZABETH,	*French,*	Washington, D. C.
VANDERKLEED, EUGENE PARKS,	*Chem. Engin.,*	Collingswood, N. J.
VANFOSSAN, VIRGINIA PRESTON,	*Astronomy,*	Lisbon, Ohio.
VANHART, THEODORE GEORGE,	*Economics,*	Lansdale.
VANKLEECK, WM. RENSSELAER, JR.,	*Elect. Engin.,*	Ridley Park.
VANWEGEN, PAUL MILLER,		Collingdale.
VAUGHAN, ELIZABETH LIPPINCOTT,	*English,*	Riverton, N. J.
VISKNISKKI, ELIZABETH WEST,	*English,*	Montclair, N. J.
VOLZE, GEORGIANA ELAINE,		New York, N.Y.
WAGNER, DOROTHEA ELOISE,	*English,*	WestHoboken, N. J.
WALKER, CATHERINE,	*Chemistry,*	Selma, Ohio.
WALKER, ELLA VIRGINIA,	*English,*	Norristown.
WALKER, JOSEPH PHILIP,	*Economics,*	Dobbs Ferry, N. Y.

Name	Major Subject	Address
WALTER, LAWRENCE PASSMORE,	*Civil Engin.,*	West Chester.
WALTON, ELIZABETH,	*Biology,*	Moorestown, N. J.
WALTON, MARGARET LYLE,	*Mathematics,*	Iron Hill, Md.
WALTZ, FRANK HUBER,	*Mathematics,*	West Chester.
WAPLES, FRANCES E.,	*Mathematics,*	Hammonton, N. J.
WARD, MURIEL,	*Biology,*	Englewood, N. J.
WARD, ROBERT ALLEN,	*Economics,*	Narberth.
WASSER, BENJAMIN WAYNE,	*Mathematics,*	Monon, Ind.
WATSON, MARIETTA,	*French,*	Philadelphia.
WAY, MARGARET EVANS,	*French Honors,*	Media.
WENZINGER, CARL JOSEPH,	*Elect. Engin.,*	Philadelphia.
WHETZEL, LUCY GERTRUDE,	*English,*	Ithaca, N. Y.
WHITE, BERTHA DEANE,	*Eng. Honors,*	Atlantic City, N. J.
WHITTEN, ROBERT K.,	*Chemistry,*	Wilmington, Del.
WIDING, THEODORE,	*Economics,*	Philadelphia.
WIESSLER, ALBERT FRANCIS,	*Economics,*	Lansdowne.
WILCOX, EDMUND QUINCY,	*Economics,*	Lansdowne.
WILDE, CHARLES HOWARD,	*Economics,*	Moore.
WILLIAMS, ANNA ROSE,	*Chemistry,*	Media.
WILLIAMS, HELEN PRISCILLA,		Philadelphia.
WILLIAMS, MARGARET BOUGHTON,		Philadelphia.
WILLIAMSON, HELEN MCKISSICK,	*Mathematics,*	West Chester.
WILLIS, ANNA ELIZABETH,	*English,*	North Wales.
WILSON, ESTHER HAMILTON,	*English,*	Toughkenamon.
WILSON, WALTER HERBERT,	*Pol. Science,*	Ridley Park.
WILT, ELMER DELANY, JR.,	*Engineering,*	Glenside.
WINCHESTER, ELIZABETH HELEN,	*French,*	Phœnixville.
WINDE, NORMAN HENRY,	*Engineering,*	Waukesha, Wis.
WIRTZ, MARGARET,	*Biology,*	Allentown.
WITSIL, MARGARET COTTON,	*Education,*	Chester.
WOERNER, PAUL LESLIE,	*Civil Engin.,*	Newark, N. J.
WOODWARD, HELEN ELIZABETH,	*English,*	West Chester.
WRIGHT, ELIZABETH MORTON,	*English,*	Philadelphia.
WRIGHT, MARY,	*Mathematics,*	Norristown.
WYNN, ELIZABETH,	*French,*	Camden, N. J.
YARNALL, HELEN GILLESPIE,	*Biology,*	Philadelphia.
YODER, CHRISTINE MYERS,	*English,*	Richmond Hill, N. Y.
ZENDT, HELEN EVELYN,	*History,*	Souderton.
ZUYDHOEK, JOHANNA GESINA,	*Mathematics,*	Pleasantville, N. Y.

GEOGRAPHICAL DISTRIBUTION OF STUDENTS

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New Jersey	78
New York	53
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Indiana	3
Colorado	3
Connecticut	3
Kentucky	2
Massachusetts	2
Michigan	2
Missouri	2
Mississippi	2
Montana	1
West Virginia	2
California	1
China	1
Idaho	1
Iowa	1
Kansas	1
North Carolina	1
Oklahoma	1
Tennessee	1
Texas	1
Washington	1
Wisconsin	1
Total	552

HOLDERS OF THE JOSHUA LIPPINCOTT FELLOWSHIP

1893-94.

THOMAS ATKINSON JENKINS, A.B., 1887; Ph.B., University of Pennsylvania, 1888; Ph.D., Johns Hopkins University, 1894; Litt.D., Swarthmore College, 1922; Professor of the History of the French Language, University of Chicago.

BENJAMIN FRANKLIN BATTIN, A.B., 1892; studied in Berlin; Ph.D., Jena, 1900.

1894-95.

DAVID BARKER RUSHMORE, B.S., 1894; M.E., Cornell University, 1895; C.E., Swarthmore, 1897; ScD., 1923. Engineer, General Electric Co., Schenectady, N. Y.

1895-96.

HOWARD WHITE, JR., B.S., 1895; M.S., University of Michigan, 1896; C.E., Swarthmore, 1900. Deceased.

1896-97; 1897-98.

JOHN W. GREGG, B.L., 1894; A.M., Cornell University, 1898; LL.B., George Washington University, 1905. Lawyer.

1898-99.

ELLWOOD COMLY PARRY, B.L., 1897; studied in Berlin; M.L., Swarthmore, 1900; Ph.D., University of Pennsylvania, 1903. Professor of German, Central High School, Philadelphia.

1899-1900; 1900-01.

JOHN EDWIN WELLS, B.L., 1896; M.L., 1899; A.M., Columbia, 1900; Ph.D., Yale University, 1915. Head of the Department of English, Connecticut College for Women.

1901-02.

MARY GRAY LEIPER, B.L., 1899; studied in Berlin.

1902-03.

BIRD THOMAS BALDWIN, B.S., 1900; A.M., Harvard University, 1903; Ph.D., *Ibid.*, 1905. Major in Sanitary Corps, U. S. Army. Research Professor of Educational Psychology, University of Iowa, Iowa City, Iowa.

1903-04.

ALBERT COOK MYERS, B.L., 1898; M.L., 1901; studied in Universities of Wisconsin and Harvard. Historical Writer.

1904-05.

MARION VIRGINIA (PEIRCE) FRANK, A.B., Swarthmore, 1903; A.M., University of Chicago, 1904; studied in Ecole des Hautes Etudes, Sorbonne, and Collége de France in Paris, and in the Libraries of Madrid. Teacher.

1905-06.

LEWIS FUSSELL, B.S., 1902; M.S., 1903; E.E. and Ph.D., University of Wisconsin, 1907. Professor of Electrical Engineering, Swarthmore College.

1906-07.

LOUIS NEWTON ROBINSON, A.B., 1905; Ph.D., Cornell University, 1911; studied in Universities of Halle and Berlin; 1906-07; Fellow in Cornell University, 1907-08.

1907-08.

SAMUEL COPELAND PALMER, A.B., 1895; A.M., 1907; A.M., Harvard University, 1909; Ph.D., *Ibid.*, 1912. Professor of Biology, Swarthmore College.

1908-09.

MARY ELIZA (NORTH) CHENOWETH, A.B., 1907; A.M., 1910; studied in Oxford University, England.

1909-10.

MARY TALBOT (JANNEY) COX, A.B., 1906; studied in University of Berlin, Germany.

1910-11.

SAMUEL COPELAND PALMER, A.B., 1895; A.M., 1907; A.M., Harvard University, 1909; Ph.D., *Ibid.*, 1912. Professor of Biology, Swarthmore College.

1911-12.

JOHN HIMES PITMAN, A.B., 1910; A.M., 1911; studied in University of California. Assistant Professor of Mathematics and Astronomy, Swarthmore College.

1912-13.

IOLA KAY EASTBURN, B.L., 1897; A.M., 1907; Ph.D., University of Pennsylvania, 1913; Professor of German, Wheaton College, Norton, Mass.

1913-14.

EDWIN ANGELL COTTRELL, A.B., 1907; A.M., Harvard University, 1913. Professor of Political Science, Leland Stanford Junior University.

1914-15.

FREDERICK MYERLE SIMONS, JR., A.B., 1909; A.M., 1912; studied in the University of Chicago. Deceased.

1915-16.

FRANK H. GRIFFIN, B.S., 1910; A.M., Columbia University, 1916; studied in Columbia University. Chief Chemist, The Viscose Company, Marcus Hook, Pa.

1916-17.

RAYMOND T. BYE, A.B., 1914; A.M., Harvard University, 1915; Ph.D., University of Pennsylvania, 1918. Assistant Professor of Economics, University of Pennsylvania.

1917-18.

CHARLES J. DARLINGTON, A.B., 1915; A.M., 1916. Chemist with E. I. du Pont de Nemours & Company.

1918-19.

JOHN E. ORCHARD, A.B., 1916; A.M., Harvard University, 1919; Ph.D., *Ibid.*, 1923. Assistant Professor, Economic Geography, School of Business, Columbia University.

1919-20.

PAUL FLEMING GEMMILL, A.B., 1917; Ph.D., University of Pennsylvania, 1925; Assistant Professor of Economics, University of Pennsylvania.

1920-21.

JOSEPH EVANS SANDS, A.B., 1917; M.D., University of Pennsylvania, 1921.

1921-22.

DETLEV WULF BRONK, A.B., 1920; M.S., University of Michigan, 1922. Instructor, University of Michigan.

1922-23.

DAVID MATHIAS DENNISON, A.B., 1921; M.S., University of Michigan, 1922; Ph.D., *Ibid.*, 1924. International Education Board Fellow, Copenhagen, Denmark.

1923-24.

WILLIAM MORSE BLAISDELL, A.B., 1921; student, University of Grenoble, France.

1924-25.

KATHARINE DENWORTH, A.B., 1914.

HOLDERS OF THE LUCRETIA MOTT FELLOWSHIP

1895-96.

HELEN BRIGHT (SMITH) BRINTON, A.B., 1895; studied in Oxford University; A.M., Swarthmore, 1899.

1896-97.

MARY STONE MCDOWELL, A.B., 1896; studied in Oxford University; A.M., Columbia University, 1903.

1897-98.

SARAH (BANCROFT) CLARK, B.S., 1897; studied in Newnham College, Cambridge.

1898-99.

EDNA HARRIET RICHARDS, B.L., 1898; studied in Berlin; A.M., Columbia University, 1904. Fellow and Instructor, University of Wisconsin, 1921-'22.

1899-1900.

MARY ELIZABETH SEAMAN, A.B., 1899; studied in Newnham College, Cambridge; A.M., Adelphi College, 1905. Teacher.

1900-01.

ANNA GILLINGHAM, A.B., 1900; A.B., Radcliffe, 1901; A.M., Columbia University, 1910. Teacher in Ethical Culture School, New York, N. Y.

1901-02.

LILLIAN WINIFRED (ROGERS) ILLMER, A.B., 1901; studied in Berlin.

1902-03.

MARGARET HOOD (TAYLOR) SIMMONS, B.L., 1902; studied in Berlin University.

1903-04.

ANNIE ROSS, A.B., 1903; Ph.M., University of Chicago, 1904. Teacher of French, High School, Flushing, L. I., N. Y.

1904-05.

CHARLOTTE RITZEMA BOGERT, A.B., 1904; A.M., Columbia University, 1905.

1905-06.

ELIZABETH HALL, A.B., 1905; A.M., Columbia University, 1906. Teacher, Media Public School.

1906-07.

BERTHA CAROLINE PEIRCE, A.B., 1906; A.M., Cornell University, 1907. Teacher, Holman School, Philadelphia.

1907-08.

JEANNETTE (CURTIS) CONS, A.B., 1907; A.M., 1909; studied in University of Berlin, Germany.

1908-09.

ELIZABETH SIKES (JAMES) NORTON, A.B., 1908; studied in University of Berlin, Germany; A.M., University of Pennsylvania, 1911; Ph.D., University of Pennsylvania, 1914.

1909-10.

HELEN HARRIET PORTERFIELD, A.B., 1909; studied in University of Chicago.

1910-11.

JEAN HAMILTON (WALKER) CREIGHTON, A.B., 1910; studied in University of Chicago.

1911-12.

ANNA HEYDT, A.B., 1911; A.M., Radcliffe College, 1912. Teacher in Palmerton, Pa., High School.

1912-13.

CAROLINE HALLOWELL (SMEDLEY) COLBURN, A.B., 1912; A.M., 1918; studied in University of California.

1913-14.

ESTHER MIDLER, A.B., 1913; studied in University of Berlin, Germany. Social Worker.

1914-15.

MARIE SAFFORD (BENDER) DARLINGTON, A.B., 1914; A.M., University of Chicago, 1916.

1915-16.

REBA MAHAN (CAMP) HODGE, A.B., 1915; A.M., Radcliffe College, 1916.

1916-17.

ANNA M. MICHENER, A.B., 1916; A.M., Columbia University, 1917; Ph.D., Columbia University, 1921; Economic Research.

1917-18.

HILDA A. LANG, A.B., 1917; studied in University of Wisconsin; A.M., University of Pennsylvania, 1921.

1918-19.

EDITH W. (MENDENHALL) HAYES, A.B., 1918; A.M., Columbia University, 1919.

1919-20.

GLADYS AMANDA REICHARD, A.B., 1919; A.M., Columbia University, 1920; Instructor, Barnard College, Columbia University.

1920-21.

HENRIETTA ALBERT SMITH, A.B., 1920.

1921-22.

ALINE MATHIESON (WOODROW) ROBERTSON, A.B., 1921; studied in University of Glasgow, Scotland.

1922-23.

HENRIETTA IDA (KELLER) HOWELL, A.B., 1922; A.M., Radcliffe College, 1923.

1923-24.

GERTRUDE MALZ, A.B., 1923; A.M., University of Wisconsin, 1924.

1924-25

GERTRUDE PAULA KNAPP, A.B., 1924; Student, Somerville College, Oxford, England.

HOLDERS OF THE JOHN LOCKWOOD MEMORIAL FELLOWSHIP

1910-11.

EDWIN CARLETON MACDOWELL, A.B., 1909; studied in Harvard University; M.S., Harvard University, 1911; Ph.D., *Ibid.*, 1912. Investigator, Cold Spring Harbor.

1911-12.

HENRY FERRIS PRICE, A.B., 1906; studied in University of Pennsylvania; A.M., University of Pennsylvania, 1913; Ph.D., University of Pennsylvania, 1915. Professor of Mathematics, Pacific University, Forest Grove, Oregon.

1912-13.

WALTER FRANK RITTMAN, A.B., 1908; A.M., 1909; M.E., 1911; Ph.D., Columbia University, 1914. Consulting Chemical Engineer, U. S. Government and State of Pennsylvania. Professor of Engineering, Carnegie Institute of Technology.

1913-14.

HELEN PRICE, A.B., 1907; studied in University of Pennsylvania; Ph.D., University of Pennsylvania, 1915. Teacher of Latin, Shipley School, Bryn Mawr, Pa.

1914-15.

HELEN HEED, A.B., 1905; studied in Radcliffe College; A.M., Radcliffe College, 1915. Teacher of English, High School, Pleasantville, N. Y.

1915-16.

FRANCES DARLINGTON, A.B., 1896; A.M., University of Pennsylvania, 1916. Teacher.

1916-17.

RACHEL KNIGHT, B.L., 1898; A.M., 1909; Ph.D., University of Iowa, 1919. Deceased.

1917-18.

RALPH LINTON, A.B., 1915; A.M., University of Pennsylvania, 1916. Anthropologist, Field Museum, Chicago.

1918-19.

WALTER HARRISON MOHR, A.B., 1914; A.M., University of Pennsylvania, 1921. Teacher, George School.

1919-20.

ESTHER E. BALDWIN, A.B., 1909; A.M., Columbia University, 1913.

1920-21.

GEORGE PASSMORE HAYES, A.B., 1918; A.M., Harvard University, 1920. Acting Professor of English, Robert College, Constantinople.

1921-22.

FRANK WHITSON FETTER, A.B., 1920; A.M., University of Princeton, 1922; A.M., Harvard University, 1924. Teacher, Princeton University.

1922-23.

MARGARET (POWELL) AITKEN, A.B., 1919; A.M., 1921.

1923-24.

WALTER HALSEY ABELL, A.B., 1920; A.M., 1924, Swarthmore College.

1924-25

EDGAR Z. PALMER, A.B., 1919; Graduate Student, University of Wisconsin.

HOLDERS OF THE HANNAH A. LEEDOM FELLOWSHIP

1913-14.

ARTHUR PERCIVAL TANBERG, A.B., 1910; A.M., 1913; Ph.D., Columbia University, 1915; studied in Columbia University. Chemist, E. I. du Pont de Nemours Co.

1914-15.

ARCHER TAYLOR, A.B., 1909; A.M., University of Pennsylvania, 1910; studied in Harvard University; Ph.D., Harvard University, 1915. Associate Professor of German, Washington University, St. Louis, Mo.

1915-16.

HAROLD S. ROBERTS, A.B., 1912; A.M., Princeton University, 1915; student in the University of Wisconsin, 1915-17. Teacher, Rutgers Preparatory School, New Brunswick, N. J.

1916-17.

HANNAH B. (STEELE) PETTIT, A.B., 1909; A.M., 1912; Ph.D., University of Chicago, 1919. Astronomer.

1917-18.

JAMES MONAGHAN, JR., A.B., 1913; A.M., University of Pennsylvania, 1918. Jensen, Utah.

1918-19.

CHARLOTTE (BREWSTER) JORDAN, B.L., 1882; M.L., 1886; studied in Madrid, Spain. Translator.

1919-20.

PAUL M. CUNCANNON, A.B., 1915; A.M., Princeton University, 1920. Instructor in Political Science, University of Michigan.

1920-21.

WILLIAM CHRISTIE MACLEOD, A.B., 1914; Ph.D., University of Pennsylvania, 1924. Instructor, University of Pennsylvania.

1921-22.

LEON M. PEARSON, A.B., 1920; A.M., Harvard University, 1922. Teacher, Oral English, Haverford School, Haverford, Pa.

1922-23.

W. RALPH GAWTHROP, A.B., 1918. Instructor, Ursinus College.

1923-24.

WILLARD S. ELSBREE, A.B., 1922; A.M., Columbia University, 1924.

1924-25

WALTER ABELL, A.B., 1920; A.M., 1924. Graduate student of fine arts in Europe.

HOLDERS OF THE MARTHA E. TYSON FELLOWSHIP

1914-15.

HELEN PRICE, A.B., 1907; studied in University of Pennsylvania; Ph.D., University of Pennsylvania, 1915. Teacher of Latin, Shipley School, Bryn Mawr, Pa.

1915-16.

ANNE SHOEMAKER (HAINES) MARTIN, A.B., 1912; A.M., University of Wisconsin, 1916.

1916-17.

KATHERINE PROCTER GREEN, A.B., 1907; A.M., Columbia University, 1917. Teacher of Latin in High School, Pleasantville, N. Y.

1917-18.

CHARLOTTE (BREWSTER) JORDAN, B.L., 1882; M.L., 1886; studied in Madrid, Spain. Translator.

1918-19.

EDNA ANNA TYSON, A.B., 1909; A.M., Columbia University, 1919. Teacher in High School, Newark, N. J.

1919-20.

DOROTHEA GILLETTE, A.B., 1914; A.M., Columbia University, 1920. Teacher of English Friends' Central School, Philadelphia, Pa.

1920-21.

BEULAH (DARLINGTON) PRATT, A.B., 1890; A.M., Teachers College Columbia University, 1922. Principal, Friends' School, West Chester, Pa.

1921-22.

RHODA A. LIPPINCOTT, A.B., 1917; A.M., Columbia Universiy, 1922. Teacher of French, Madison, N. J., High School.

1922-23

GRACE COCHRAN, A.B., 1917. Student, Certificat d' Aptitude d' enseigner la français à l'étranger, Sorbonne, France, 1922.

1923-24

MILDRED E. (WILLARD) ERY, A.B., 1920; A.M., 1924, University of Pennsylvania.

1924-25

CAROLINE P. MYRICK, A.B., 1914; A.M., Radcliffe College, 1916. Graduate student, Radcliffe College.

HOLDERS OF THE IVY MEDAL*

1898. Anna Belle Eisenhower, A.B., 1899; A.B., Radcliffe College, 1900; A.M., *Ibid.*, 1907.
1899. Mary G. Leiper, B.L., 1899.
1900. Mary S. Haviland, B.L., 1900; A.B., Radcliffe, 1901.
1901. George A. Seaman, A.B., 1901. Deceased.
1902. Elliott Richardson, B.S., 1902; C. E. 1905.
1903. Samuel T. Stewart, A.B., 1903.
1904. Halliday R. Jackson, A.B., 1904.
1905. Louis N. Robinson, A.B., 1905; Ph.D., Cornell University, 1911.
1906. T. H. Dudley Perkins, A.B., 1906. Deceased.
1907. Amos J. Peaslee, A.B., 1907; LL.B., Columbia University, 1911.
1908. Herman Pritchard, B.S., 1908; A.M., 1911.
1909. Walter F. Rittman, A.B., 1908; A.M., 1909; M.E., 1911; Ph.D., Columbia University, 1914.
1910. John E. Johnson, B.S., 1910.
1911. Joseph H. Willits, A.B., 1911; A.M., 1912; Ph.D., University of Pennsylvania, 1916.
1912. Herman Elliott Wells, B.S., 1912.
1913. Henry Lee Messner, A.B., 1913.
1914. Albert Roy Ogden, A.B., 1914. Deceased.
1915. Thomas Bayard McCabe, A.B., 1915.
1916. Hugh Frederick Denworth, A.B., 1916; A.M., University of Pennsylvania, 1918.
1917. William West Tomlinson, A.B., 1917.
1918. Frederick Stockham Donnelly, A.B., 1918.
1919. Charles Manly Howell, A.B., 1919.
1920. Detlev Wulf Bronk, A.B., 1920; M.S., University of Michigan, 1922.
1921. Alan C. Valentine, A.B., 1921. Rhodes Scholar in attendance at University at Oxford.
1922. Richard William Slocum, A.B., 1922.
1923. Arthur Joy Rawson, A.B., 1923.
1924. Richmond Pearson Miller, A.B., 1924.

OAK LEAF MEDAL*

1922. Barbara (Manley) Philips, A.B., 1922.
1923. Isabelle Shaw (Fussell) Ewing, A.B., 1923.
1924. Gertrude Paula Knapp, A.B., 1924.

* The terms of the award of these medals are found in an earlier part of the catalogue.

DEGREES CONFERRED IN 1924

Bachelor of Arts with Honors

In English

Gertrude Paula Knapp I.....Palmyra, N. J.
Carolyn Armitage Krusen II.....Philadelphia.
Charles Barker Muth III.....West Chester.
Mary Swartzlander II.....Doylestown.

In the Social Sciences

Esther May Briegel II.....Philadelphia.
Herbert Eyres Cliff IV.....East Stroudsburg.
Richmond Pearson Miller III.....Reading.
H. Merle Mulloy III.....Drexel Hill.

BACHELOR OF ARTS

With the Major in Biology

Elizabeth Stewart Bean.....Bala-Cynwyd.
Eliza Moore Fisher.....Swarthmore.
Florence Wolverton Green.....Swarthmore.
Mahlon Carleton Hinebaugh.....Oakland, Md.
Gertrude Hollingsworth.....Ardmore.
Janet Krall.....Lansdowne.
Sidney Elizabeth Pollick.....Philadelphia.
George Willoughby Stephenson.....Philadelphia.
Helen Van Etten.....Milford.
Holland Williamson.....Danville, Ill.

In Chemistry

Amos Dotterer.....Wayne.
Thomas Otto Hertzberg.....Sheboygan Falls, Wis.
Kenneth Payne Martin.....Richmond Hill, N. Y.
Miriam Frances Naylor.....Allentown, N. J.
Lois Lee Vanderkleed.....Collingswood, N. J.

In Chemical Engineering

Bodine Brinton Barrett.....Philadelphia.
Charles Alfred Paxson.....West Chester.

In Economics

JOHN CHARLES ADAMS.....Lansdowne.
LEWIS SIMMS AYARS, JR.....Alloway, N. J.
C. CLIFFORD BARNES.....Swarthmore.
ROBERT PIERCE BODINE.....Trenton, N. J.
RUTH ELEANOR BONNER.....Kutztown.
EDGAR MATTERN BRILL.....Philadelphia.
CLARENCE HOWARD CARR.....Pleasant Mount.
SAMUEL LOUIS CORNISH.....Collegeville.
ELIZABETH ST. JOHN BURTON.....Philadelphia.
RUSSELL MANSON HEATH.....Great Falls, Mont.
CARL FREDERICK KNAUER.....Holmesburg.
LATELLE M. LAFOLLETTE.....Charleston, W. Va.
FRANK CLARK LONG.....Ridley Park.
FREDERICK ALLEN MUSSELMAN.....Chester.
FLORENCE ELIZABETH ROGERS.....Corry.
DAVID ROSE.....Chester.
DAVIS WILBUR SHOEMAKER.....Fox Chase.
DAVID ROBERT WATSON.....Chester.
CHESTER GIRARD ATKINSON ZUCKER.....Elizabeth, N. J.

In Education

LUTHER LLOYD LINDERMAN.....Monocacy.
ROBERT MOSS TAYLOR.....Philadelphia.

In English

HELEN MARY BEACH.....Chester.
MARY PARKE BICKING.....Downingtown.
LIVINGSTON LORD BLAIR.....Springfield, Ill.
HELEN LOUISE DAVIS.....Johnstown.
DOROTHY DENLINGER.....New York, N. Y.
ANNETTE ENGELL.....Philadelphia.
DOROTHY MILLER EVANS.....Media.
ESTHER JOSEPHINE FISHER.....Glen Ridge, N. J.
CATHERINE FITZHUGH.....Ridgewood, N. J.
ELIZABETH HAMILTON.....Wilkinsburg.
ESTHER JACKSON HICKS.....Westbury, L. I., N. Y.
ANNE PARKER HUNT.....Peoria, Ill.
MARGARET JESSEN.....Hightstown, N. J.
MARIAN LYSTON JONES.....Harrington, Del.
MARY HOBSON JONES.....Pottstown.
MARGARET DENNISON LEVERING.....Philadelphia.
MARIAN JORDAN LODGE.....Paulsboro, N. J.
FREDERICK RAMSAY LONG.....Chester.

MARY CROUSE MELVIN ..... Denton, Md.
MARY MOORE MILLER ..... Spencerville, Md.
SARA ALICE SCHRACK ..... Coatesville.
VIRGINIA SMITH ..... Evanston, Ill.
LOIS MAUD WALKER ..... East Orange, N. J.
MARY FELL WALTER ..... Swarthmore.
ELIZABETH ADELE WEILER ..... Glenolden.
CATHARINE WILSON ..... Lansdowne.
WALDEMAR PARKER WOOD ..... Coatesville.
GERTRUDE WALTON YARNALL ..... Yeadon.
JOSEPHINE DEAN ZARTMAN ..... Philadelphia.

In French

ELIZA RANSON BROOKE ..... Reading.
ELEANOR PROVOST CARMICHAEL ..... Elizabeth, N. J.
MARGARET ESTELLA DRISCOLL ..... Verona Beach, N. J.
HELEN V. DUFFY ..... Coaldale.
CATHERINE ROTH GARNER ..... Shenandoah.
MILDRED FAWCETT WILSON ..... West Chester.
RIDDELL YOUNG ..... Lansdowne.

In History

MARGARETT HERRMANN ..... Washington, D. C.
ROBERT COLSHER HUBBS ..... Philadelphia.
DOROTHY BEAUMONT LAPP ..... West Chester
DOROTHY REGISTER SNIFFEN ..... Philadelphia.
ELMER ELLSWORTH TITTLE ..... Lebanon.

In Latin

MARY ELIZABETH SHINN ..... Swarthmore.
JENNIE RYAN ..... Forest Grove.

In Mathematics and Astronomy

LAURA ISABEL FRITTS ..... Philadelphia.
NELLIE MAY HENDERSON ..... Millville, N. J.
EARL LARKIN WILLIAMS ..... West Chester.

In Political Science

WILLIAM ARMENT BURNS ..... Chester.
GUY WITHERSTON DAVIS ..... Glenolden.
ALLAN KUHN GRIM ..... Kutztown.
DOROTHY MCCLAREN ..... Connellsville.
FREDERICK STARLING, JR. ..... Alden.
KENNETH CHARLES WALTER ..... Shawnee-on-Delaware.

In Civil Engineering

JAMES CHARLES TILY.....Cynwyd.

In Electrical Engineering

EDWARD ATKINSON GREEN.....Kennett Square.
THOMAS SUMNER OLIVER.....Chester.
J. HOWARD THOMPSON, JR. .....Kennett Square.
ALBERT JAMES WILLIAMS, JR.....Media.

In Mechanical Engineering

ROBERT HAROLD LLOYD.....Philadelphia.
HERBERT CADWALLADER MODE.....Wilmington, Del.
ROGER SIDWELL RUSSELL.....Baltimore. Md.
THOMAS THOMSON TAYLOR.....Elkins Park.

MASTER OF ARTS

With the Major in Biology

EDWARD L. CAUM

With the Major in Fine Arts

WALTER HALSEY ABELL

Electrical Engineer

PAUL MITCHELL HESS,
A.B., Swarthmore College, 1920.
GEORGE ALFRED POWELL,
A.B., Swarthmore College, 1921.

Mechanical Engineer

WALTER HAINES DICKINSON,
A.B., Swarthmore College, 1921.
G. DONALD SPACKMAN,
A.B., Swarthmore College, 1917.

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