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Bryn Mawr College Examination Papers Set for Matriculation in the Autumn, 1897

Bryn Mawr College

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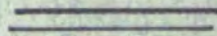
BRYN MAWR COLLEGE.



EXAMINATION PAPERS
SET FOR MATRICULATION

IN THE

AUTUMN, 1897.



*This pamphlet may be obtained at the Secretary's Office, Bryn Mawr College,
on payment of twenty-five cents.*

BRYN MAWR COLLEGE.

EXAMINATIONS FOR MATRICULATION.

Examinations for matriculation in Bryn Mawr College are held at the college during the week preceding the opening of each academic year, and also during the last week of each academic year. In the spring examinations may also be arranged for in other places. In 1898 examinations for matriculation will be held from May 27th to June 1st, inclusive, at Bryn Mawr College, and also in Boston, New York, Philadelphia, Baltimore, Chicago, Louisville, in Portland, Oregon, College Park, California, and in London or Paris. Examinations for matriculation will also be held during the last week of the first semester of each year, but only at Bryn Mawr College, and for those candidates only that intend to enter the college at the half-year.

Requests for examinations elsewhere than at Bryn Mawr College must be made at least six weeks before the date set for the beginning of the examination. Except in cases where the college has made special arrangements, an examination fee of five dollars is charged whenever the examination, or any part of it, is taken elsewhere than at Bryn Mawr College, and this fee must be paid to the Examiner before the candidate is admitted to the examination.

SPRING, 1898.

MAY 27.	31.
<i>English Grammar, etc.</i> , 9½—11	<i>Latin Composition</i> , 9—10½
<i>English Composition</i> , 11—1	<i>History</i> , 11—1
<i>Geometry</i> , 2½—5	<i>German</i> , 2½—5½
28.	JUNE 1.
<i>Algebra</i> , 9—12	<i>Greek</i> , 9—12
<i>French</i> , 2—5	<i>Minor Latin, Section A</i> , 9—12
30.	<i>Solid Geometry</i>
<i>Latin Prose Authors</i> , 9—10½	<i>and Trigonometry</i> , 2—5
<i>Latin Poets</i> , 11¼—1	<i>Minor Latin, Section B</i> , 2—5
<i>Science</i> , 3—5	

AUTUMN, 1898.

SEPTEMBER 26.	29.
<i>English Grammar, etc.</i> , 9½—11	<i>Latin Composition</i> , 9—10½
<i>English Composition</i> , 11—1	<i>History</i> , 11—1
<i>Geometry</i> , 2½—5	<i>German</i> , 2½—5½
27.	30.
<i>Algebra</i> , 9—11	<i>Greek</i> , 9—12
<i>French</i> , 2—5	<i>Minor Latin, Section A</i> , 9—12
28.	<i>Solid Geometry</i>
<i>Latin Prose Authors</i> , 9—10¾	<i>and Trigonometry</i> , 2—5
<i>Latin Poets</i> , 11¼—1	<i>Minor Latin, Section B</i> , 2—5
<i>Science</i> , 3—5	

MID-YEAR, 1898.*

JANUARY 31.	3.
<i>English Grammar, etc.</i> , 9½—11	<i>Latin Composition</i> , 9—10½
<i>English Composition</i> , 11—1	<i>History</i> , 11—1
<i>Geometry</i> , 2½—5	<i>German</i> , 2½—5½
FEBRUARY 1.	4.
<i>Algebra</i> , 9—12	<i>Greek</i> , 9—12
<i>French</i> , 2—5	<i>Solid Geometry</i>
2.	<i>and Trigonometry</i> , 2—5
<i>Latin Prose Authors</i> , 9—10¾	
<i>Latin Poets</i> , 11¼—1	
<i>Science</i> , 3—5	

The examination for matriculation must be taken by all who wish to pursue their studies at the college, either as candidates for a degree or as special students, unless they present a certificate of honorable dismissal from some college or university of acknowledged standing. The examination for matriculation will also be open to those who wish to take it as a test of proficiency in elementary studies, but have no intention of entering the college; and certificates will be given to those who are successful in passing the examination.

The subjects in which the candidate for matriculation must be examined are divided, for convenience of marking, into fifteen sections. A candidate may divide the examination into two parts, provided that not more than one calendar year and the summer recess elapse between the two parts of the examination. Should the candidate pass in fewer than three sections in the first division of

* The Mid-year examinations are open to those candidates only that intend to enter the college at the half-year.

the examination, the entire examination must be repeated. To secure a certificate of admission to the college, the candidate must have attempted all the fifteen sections included in the examination, and must have passed in at least eleven sections. All entrance conditions must be passed off within twelve months after the student enters the college classes.

Candidates are expected to show by their papers that all the subjects required for matriculation have been studied for a reasonable length of time, and are not presented as a mere form. Total failures at the second examination in all the branches of a language other than English, or in Mathematics, when such failure is of a character to indicate that the subject has been presented as a mere form, shall prevent the candidate from receiving any certificate for that examination, unless she can produce satisfactory evidence that the subject in question has been pursued for a reasonable length of time.

In addition to the subjects hitherto included in the examination for matriculation, the minor course in Latin, as outlined in the program, may also be offered for examination by candidates for admission that wish to enter with advanced standing; but neither the minor course in Latin, Solid Geometry, Trigonometry, nor the fourth language, may be substituted for any part of the fifteen sections.

Bryn Mawr College offers annually eight competitive scholarships, four of the value of \$300 and four of the value of \$200, to candidates presenting themselves for the Spring matriculation examinations of Bryn Mawr College, a first scholarship of the value of \$300 and a second of the value of \$200, being open to candidates from each of the following districts.—(a) The New England States; (b) New York, New Jersey, and Delaware; (c) Ohio, Indiana, Illinois, Michigan, and Wisconsin, and the states west of the Mississippi river; (d) Pennsylvania and all places not included in (a), (b), and (c).

The district to which a candidate shall be considered to belong shall be determined by the school at which she received her final preparation, or in case of preparation by private study by the place of residence during the year preceding the final examination; but the candidate may present herself for examination at any place where such examination is held.

These scholarships, which are to be held for one year only, shall be awarded in each of the above named districts on the basis of the sum total of marks obtained by the candidate; but no one shall be

considered eligible for the first scholarship who has received more than one condition in all the fifteen sections of the examination, and no one shall be considered eligible for the second scholarship who has received more than three conditions in the fifteen sections of the examination. When the examination has been divided, no account will be taken of those conditions incurred in the first part which have been passed off in the final examination.

The competition is limited to those who intend to spend at least one year in residence at Bryn Mawr College, who have not studied at any other college, and who have not before presented themselves more than once in the Bryn Mawr College matriculation examinations. All those who present themselves shall be *ipso facto* candidates for these scholarships, no formal declaration of candidacy being required.

Inquiries may be addressed to the Secretary of Bryn Mawr College, and to the following graduates of Bryn Mawr College, who have kindly consented to serve as Honorary Corresponding Secretaries :

BERTHA HAVEN PUTNAM, A.B., 245 *West 75th Street*, NEW YORK CITY.

MILDRED MINTURN, A.B., 109 *East 21st Street*, NEW YORK CITY.

MARY McMURTRIE, A.B., *Chestnut Hill*, PHILADELPHIA.

SOPHIA WEYGANDT HARRIS, A.B., (MRS. JOHN McARTHUR HARRIS), 5305 *Main Street*, GERMANTOWN.

EDITH PETTIT, A.B., 2205 *Trinity Place*, PHILADELPHIA.

MARGARET THOMAS CAREY, A.B., (MRS. ANTHONY MORRIS CAREY), 835 *Eutaw Street*, BALTIMORE, MARYLAND.

RUTH WADSWORTH FURNESS, A.B., 417 *Orchard Street*, CHICAGO.

CATHARINE BEAN COX, A.B., (MRS. ISAAC M. COX), TULARE, TULARE COUNTY, CALIFORNIA.

ALICE JONES, A.B., SANTA MONICA, LOS ANGELES COUNTY, CALIFORNIA.

ALYS PEARSALL SMITH RUSSELL, A.B., (HON. MRS. BERTRAND RUSSELL), 44 *Grosvenor Road*, S. W., LONDON, ENGLAND.

Applications for admission to the examinations for matriculation should be made to the Secretary of Bryn Mawr College.

SECRETARY'S OFFICE, BRYN MAWR COLLEGE,
BRYN MAWR, PENNSYLVANIA.

December, 1897.

TABULAR STATEMENT

OF THE

EXAMINATION FOR MATRICULATION.

Tabular Statement.—All candidates for matriculation *must* be examined in the following three groups :

	I.	II.	III.
<i>Mathematics</i>	{ Algebra, 2. Plane Geometry, 1.	Latin Grammar and Composition, 1. Sight reading in Latin prose, 1. Sight reading in Latin poetry, 1.	History, 1. English, 1. Science, 1.

All candidates for matriculation *must* be examined also in one of the following groups :

	IV.	IV.	IV.
<i>Greek</i>	{ Gram. and Comp., 1. Sight reading in Greek prose, 1.	<i>or</i>	{ Gram. and Comp., 1. Sight reading in Greek prose, 1.
<i>and</i>	{ Sight reading in Greek poetry, 1.	<i>and</i>	{ Sight reading in Greek poetry, 1.
<i>French</i>	{ Grammar, } Prose, } 3. Poetry. }	<i>or</i>	{ Grammar, } Prose, } 3. Poetry. }
		<i>German</i>	<i>French</i>
		{ Grammar, } Prose, } 3. Poetry. }	{ Grammar, } Prose, } 3. Poetry. }

The candidate *may* be examined in the following subjects, and if not examined, must pursue them either in the college classes or privately, and pass an examination in them before receiving the Degree of Bachelor of Arts :

<i>Advanced</i>	Solid Geometry,*	} <i>A fourth language,</i>	† <i>Greek</i> (as above)
<i>Mathematics</i>	Plane Trigonometry.		<i>or</i>
			<i>French</i> (as above)
			<i>or</i>
			<i>German</i> (as above)

* For the examination in Solid Geometry may be substituted a course in Geometrical Conics as outlined on page 124 of the college program.

† Students that have omitted Greek in the examination for matriculation may substitute for the elementary course in Greek the minor course in Latin.

The minor course in Latin may also be offered for examination by candidates for matriculation that desire to enter college with advanced standing, and, at their discretion, by matriculated students without attendance on the college classes. The minor course is considered for this purpose as comprising two sections, constituted as follows :

A. Cicero, *2nd Philippic*, Livy, *Bk. xxi.*, Latin Prose Composition, including a detailed knowledge of the more abstruse Latin constructions, and some facility in turning simple English narrative into Latin.

B. Horace, *Odes*, *Epodes*, and *Carmen Saeculare*, except *Odes* *i.* 25, 27, 33, 36; *ii.* 5; *iii.* 6, 15, 20; *iv.* 1, 8, 10, 13; *Ep.* 3, 5, 8, 11, 12, 15, 17.

No substitutions are allowed for any part of the above requirements, except in the case of students entering with advanced standing from other colleges.

There are two examinations, one in Section *A*, and one in Section *B*, each three hours in length; failure to pass in Latin Prose Composition involves failure in the whole of Section *A*. These examinations may be taken in different years, and in the order preferred by the candidate; they are held only at the time of the regular matriculation examinations at the beginning and end of the college year, and application for admission to them must be made at least three weeks in advance.

The subjects in which the candidate for matriculation *must* be examined are divided, for convenience of marking, into fifteen sections. It will be observed that each language other than English is counted as three sections. Groups I., II., and III. contain three sections each; group IV. contains six sections. The figures attached to the subjects show the number of sections contained in each subject; where a bracket precedes the figure, the subjects enclosed by the bracket cannot be separated in the examination. Should the candidates pass in fewer than three sections in the first division of the examination, the entire examination must be repeated; but the three sections need not, except where this is indicated by the brackets, belong to one and the same group. Solid Geometry and Trigonometry or the fourth language cannot be substituted for any part of the fifteen sections.

Candidates are expected to show by their papers that all the subjects required for matriculation have been studied for a reasonable length of time. When the failure in any subject is of a character to indicate that the subject has been offered as a mere form, the candidate renders herself liable to receive no certificate for the examination in which the failure occurred.

I. Mathematics.—(1) and (2) Algebra. (3) Plane Geometry.

The examination in Algebra will comprise Elementary Operations, Quadratic Equations, Problems, Ratio, Proportion, Variation, Arithmetical and Geometrical Progressions.

While there will be no formal examination in Arithmetic, an adequate knowledge of the subject will be required throughout the mathematical examination; in *all* the papers there will be some numerical problems, and the correct solution of a fair number of these will be regarded as essential.

All candidates that do not, in addition to the above, present *Solid Geometry** and *Trigonometry* (including the use and theory of logarithms and the solution of triangles), must pursue these branches and pass an examination in them before receiving a degree. It is especially recommended that those intending to elect mathematical courses should pass the entire matriculation examination in mathematics. These candidates are advised to confine themselves to Algebra; Plane Geometry of the straight line and the circle; Solid Geometry and Trigonometry. More benefit will be derived from a thorough acquaintance with the pure geometrical methods than from a little knowledge of Analytical Geometry.

Students whose matriculation examination has included either Solid Geometry, or Trigonometry, or both, will be credited with the time which others must subsequently spend upon these studies.

Phillips and Fisher's *Elements of Geometry* or Wentworth's *Geometry* will be found suitable for preparation for the examination in Plane Geometry; for the examination in Solid Geometry—either of these books or Wilson's *Solid Geometry* (Macmillan) is suitable; in Algebra and Trigonometry C. Smith's *Elementary Algebra* (American edition, revised by Irving Stringham), and Lock's *Trigonometry for Beginners* (Macmillan) are recommended.

II. Latin.—(1) Grammar and Composition. (2) Translation at sight of simple passages in Latin prose. (3) Translation at sight of simple passages in Latin poetry. Due allowance is made for unusual words and there are questions testing the candidate's practical knowledge of grammar and prosody.

The so-called Roman method of pronunciation, as explained in Gildersleeve's or in Allen and Greenough's *Latin Grammar*, is required.

As many schools are introducing the "natural method" as a substitute for thorough grammatical training, attention is called to the fact that special stress will be laid on an accurate and ready knowledge of grammatical forms. A knowledge of paradigms and parts of irregular verbs will be insisted upon.

Candidates are advised, whenever possible, to try the whole Latin examination at one time, although the three sections may be taken separately, and in any order the candidate may prefer.

*For the examination in Solid Geometry may be substituted a course in Geometrical Conics as outlined on page 124 of the college program.

III. History.—(1) The outlines of the History of Greece and Rome ; or the outlines of the History of England and the United States.

Oman's *History of Greece* (second edition) ; Allen's *History of the Roman People* ; Gardiner's *A Student's History of England* ; Johnston's *History of the United States* and *The United States : its History and Constitution*, are recommended. It is also recommended, though in no sense required, that candidates become familiar, by means of carefully selected collateral references, with other books somewhat different in character from those mentioned above : such as, for Grecian History, Holm's *History of Greece*, vol. i., and *Epochs of Ancient History*, edited by Cox and Sankey, published by Longman ; for Roman History, Schuckburgh's *History of Rome*, Headlam's *Outlines of Roman History* and the *Epochs of Ancient History*, already mentioned ; for English History, *English History from Contemporary Sources*, edited by Hutton, and Powell, published by Putnam, and *Epochs of English History*, edited by Creighton, published by Longman ; for American History, *Epochs of American History*, edited by Hart, published by Longman.

English.—(1) The candidate is required to write a short English composition, correct in spelling, grammar, punctuation, and general arrangement, and to correct specimens of bad English.

In 1898 candidates must be familiar with Chaucer's *Knight's Tale* ; Shakespeare's *Macbeth* and *Midsummer Night's Dream* ; Milton's *L'Allegro*, *Il Penseroso*, *Lycidas*, and *Paradise Lost*, Books I. and II. ; Addison's *Sir Roger de Coverley Papers* ; Matthew Arnold's *Essay on Gray* and *Essay on A Guide to English Literature* ; Wordsworth's *Michael* and *The Leech Gatherer* ; Coleridge's *Ancient Mariner* and *Christabel* ; Shelley's *Adonais* and *Sensitive Plant* ; Keats's *Eve of St. Agnes* ; Hawthorne's *House of the Seven Gables* ; Pater's *Child in the House* ; and Stevenson's *Master of Ballantrae*.

In 1899 candidates must be familiar with Chaucer's *Knight's Tale* ; Shakespeare's *Macbeth* and *As You Like It* ; Milton's *L'Allegro*, *Il Penseroso*, *Lycidas*, and *Paradise Lost*, Books I. and II. ; Addison's *Sir Roger de Coverley Papers* ; Matthew Arnold's *Essay on Gray* and *Essay on A Guide to English Literature* ; Wordsworth's *Michael* and *The Leech Gatherer* ; Coleridge's *Ancient Mariner* and *Christabel* ; Shelley's *Adonais* and *Sensitive Plant* ; Keats's *Eve of St. Agnes* ; Tennyson's *Passing of Arthur* ; Hawthorne's *House of the Seven Gables* ; Pater's *Child in the House* ; Stevenson's *Kidnapped*.

The books recommended for the years 1898 and 1899, by the Commission of Colleges of New England, will be accepted as equivalents. The books prescribed for candidates taking the regular examinations for matriculation in any given year will be required also of candidates taking the special matriculation examination provided for students entering the college in the February of the year following. Candidates passing off conditions after admission to the college may offer the books prescribed in the examination in which the condition was imposed.

In preparing for this examination especial attention should be given to paragraph-structure and to sentence-structure. Hill's *Foundations of Rhetoric*, Abbott's *How to Write Clearly*, and Bigelow's *Handbook of Punctuation*, are recommended.

Science.—(1) The elements of one of the following sciences :—Physics, or Chemistry, or Botany, or Physiology, or Physical Geography.

Carhart and Chute's or Gage's *Elements of Physics*, Remsen's *Introduction to the Study of Chemistry* (Briefer Course), Bessey's *Essentials of Botany*, Martin's *Human Body* (Briefer Course) or Foster's *Physiology for Beginners*, and Russell Hinman's *Physical Geography* are recommended. Candidates are advised, whenever possible, to offer Physics, as this study forms a better basis for further scientific work. It is recommended, though in no sense required, that candidates should have some knowledge of the metric system.

IV. Two of the following languages :

Greek.—(1) Grammar and composition. (2) Translation at sight of simple passages in Attic Prose, such as Xenophon's *Anabasis* or *Memorabilia*.

(3) Translation at sight of passages of average difficulty from Homer. Due allowance is made for unusual words and there are questions testing the candidate's practical knowledge of grammar, including prosody.

White's *Beginners' Greek Book* and Jones' *Exercises in Greek Prose*, or equivalents, are recommended.

French.—(1) The examination in French has three divisions, one to test the candidate's knowledge of pronunciation and ordinary grammatical forms, the other two, her power to read at sight ordinary French prose and verse.

For the examination in reading no texts are assigned, the examination being intended to test the candidate's ability to read any ordinary French whatsoever. Candidates preparing for these examinations are advised to acquire as large a vocabulary as possible. They are further advised in their study of verbs to concentrate their attention on the regular verbs, the auxiliaries *être, avoir*, such important irregular verbs as *aller, devoir, dire, faire, mettre, prendre, pouvoir, vouloir, tenir, venir, voir, écrire, lire, croire, boire*, and the typical verbs, *conduire, craindre, paraître, partir*, and to acquire a fair knowledge of the use of the various past tenses and of the rules of the subjunctive.

The examination in French may not be divided.

Teachers preparing students that wish to elect French in the college are advised to train their pupils to write French from dictation in order to enable them to understand lectures delivered in that language.

German.—(1) The examination in German is precisely similar to that in French, and will test the candidate's pronunciation, knowledge of ordinary grammatical forms, and ability to read ordinary German at sight.

The examination in German may not be divided.

The candidate may omit one of the three languages, Greek, French, or German, selecting for examination Greek and French, or Greek and German, or French and German.

With the exception of the Minor Course in Latin, all subjects potentially included in the examination for admission are regarded by the college as preparatory and non-collegiate. The college course of instruction in mathematics, for example, does not include but presupposes trigonometry; the courses in French and German presuppose a reading knowledge of these languages.

It is therefore to the interest of every candidate to offer, at entrance, advanced mathematics, and if possible all four languages, since to fail in such of these examinations as are not strictly obligatory will not affect the candidate's collegiate standing, and to pass them successfully will leave her nearly free for elective study under the Group System and for true collegiate work.

EXAMINATION PAPERS
SET FOR MATRICULATION
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AUTUMN, 1897.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

ALGEBRA. (*Counted as two sections.*)

AUTUMN, 1897. -- THREE HOURS.

1. Simplify

$$\left\{ \frac{\sqrt{x+1}}{\sqrt{x-1}} - \frac{\sqrt{x-1}}{\sqrt{x+1}} \right\} \frac{\sqrt{x^3-1}}{\sqrt{x^2+x+1}}$$

Reduce to its lowest terms

$$\frac{1}{1 - \sqrt{1-x^2}} - \frac{1}{1 + \sqrt{1-x^2}} + \frac{2}{\sqrt{1-x^2}}$$

2. Simplify

$$\sqrt{12} + \frac{1}{10} \sqrt{72} + 8 \frac{1}{\sqrt{32}}$$

Transform

$$\frac{3\sqrt{2}}{3\sqrt{2} - \sqrt{6}}$$

so that it may have a rational denominator.

3. If $a : b :: c : d$, prove that

$$2a + 3b : 2a - 3b :: 2c + 3d : 2c - 3d,$$

and that

$$ab + cd : b^2 + d^2 :: a : b.$$

[OVER]

4. Solve the equations

$$(i.) \frac{x-1}{2} + \frac{5x^2 - 5x - 18}{10(x-2)} - \frac{5x-4}{5} = 0;$$

$$(ii.) \sqrt{\frac{3}{x}} + \sqrt{\frac{x}{3}} = 2;$$

$$(iii.) (a^2 - b^2)(x^2 + 1) = 2(a^2 + b^2)x.$$

5. If x_1, x_2 are the roots of the equation

$$ax^2 + bx + c = 0,$$

find in terms of a, b, c the values of

$$\frac{1}{1+x_1} + \frac{1}{1+x_2} \quad \text{and} \quad \frac{1}{(1+x_1)^2} + \frac{1}{(1+x_2)^2}$$

6. Define a^m and prove that $(a^m)^n = a^{mn}$.

Simplify the expression

$$\left\{ (a^{1\frac{4}{5}} b^{\frac{3}{8}})^{-\frac{1}{2}} \times (a^{-\frac{3}{20}} b^{-\frac{2}{3}})^{\frac{1}{2}} \right\}^{-120}$$

7. Distribute \$3150 among A, B, C, and D so that B and C may together have half what A and D have together, that B's money may be $\frac{7}{8}$ ths of C's, and D's money $\frac{2}{5}$ ths of A's.

8. Prove that if

$$2x + y = m, \quad x + 2y = n, \quad (x + y)^2 = 2(x - y)^2,$$

then

$$17(m^2 + n^2) = 38mn.$$

9. Find the sum of a given geometric progression; and explain how the sum of an infinite number of terms may have a finite value. Prove that $.33333 \dots$ to infinity $= \frac{1}{3}$.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

PLANE GEOMETRY. (*Counted as one section.*)

AUTUMN, 1897.—TWO AND A HALF HOURS.

1. Define the terms right angle, perpendicular.

Prove that every point in the perpendicular bisector of the line joining two given points is at equal distances from the points; and that every point not in this bisector is at unequal distances from the points.

AB is a given straight line, C, D, two points not on it; find a point on AB at equal distances from C, D. Find also on a given circle a point that shall be at equal distances from the two given points C, D. Does such a point necessarily exist?

2. Prove that the area of a triangle is one-half of the area of the parallelogram on the same base and of the same altitude.

ABCD is a parallelogram, P an external point lying between the sides AB, CD produced; P is joined to A, B, C, D. Show that the sum of the areas of the triangles PAB, PCD is equal to the difference of the areas of the triangles PAD, PBC.

3. Prove that a line drawn parallel to the base of a triangle divides the sides proportionally.

ABCD is a parallelogram, E a point on BC such that BE is one fourth of BC. AE cuts the diagonal BD in F; show that BF is one fifth of BD.

4. Prove that the angle made by a tangent to a circle with a chord through its point of contact is equal to the
[OVER]

angle contained by one segment of the circle cut off by the chord.

Tangents AB , AC are drawn to a circle, B , C being their points of contact; the line joining A to the centre cuts the circle in D . Show that BD bisects the angle ABC .

5. Define a tangent to a circle, and prove that the tangent at any point is perpendicular to the diameter through that point.

Two circles touch, and through their point of contact a line is drawn to cut them again at A and B . Prove that the tangents at A and B are parallel.

6. Prove that if from a point without a circle a secant and a tangent are drawn, the tangent is a mean proportional between the whole secant and the external segment.

Apply this to show that the tangent, drawn to two circles from any point on their common chord produced are equal in length; and that if the tangents from a point to two intersecting circles are equal in length, the point lies on the common chord produced.

7. Prove that if two polygons are similar they can be divided into the same number of similar parts, similarly placed.

8. Prove that the areas of two similar figures are proportional to the squares of any two corresponding lines.

Show that all circles are similar; and that their areas are proportional to the squares of their radii.

9. Prove that the bisectors of the vertical angle of a triangle divide the base internally and externally in the ratio of the sides.

Show how to describe on a given base a triangle having its vertical angle equal to one-half of a right angle, and its sides in the ratio $3 : 1$.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION

LATIN. (*Counted as three sections.*)

FIRST SECTION: GRAMMAR AND PROSE COMPOSITION.

AUTUMN, 1897.—ONE AND A HALF HOURS.

1. Decline *deus*, god, and *os*, bone, face. Decline the pronominal adjective *nullus*. When is *bini* used for *duo*? Express in Latin, "in the year 516 from the founding of the city." Give a synopsis of *facio*, active and passive. Give the principal parts of *ducere*, *fallere*, *manere*, *ordiri*, *sumere*.

2. What is the difference between *primo* and *primum*? When is the accusative with the infinitive used? How do you express the English pluperfect after a time-conjunction? What is the general rule for sequence of tenses? Can you give one exception? What prepositions take two cases?

3. Translate into Latin:

I am going into Philadelphia to ask my brother for some money with which I can buy a new book. Why do you study Latin? Is one language as good as another? I was dining at home, but I was sorry that no one was with me. I do not envy you your new books, for they cannot cure you when you are ill. One-half of my bread I ate; this I enjoyed; I presented the beggar with the rest; this I did not enjoy, but I knew that I had benefited him, and I rejoice at that.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

LATIN. (*Counted as three sections.*)

SECOND SECTION: PROSE AUTHORS.

AUTUMN, 1897.—ONE AND THREE-QUARTER HOURS.

1. Translate Cæsar, *de bello Gallico*, VII., 34, 35. Cæsar's operations against Vercingetorix.

Hoc decreto interposito cohortatus Aeduos ut controversiarum ac dissensionum obliviscerentur atque omnibus omissis rebus huic bello servirent, eaque quae meruissent praemia ab se devicta Gallia exspectarent, equitatumque omnem et peditum milia x sibi celeriter mitterent, quae in praesidiis rei frumentariae causa disponeret, exercitum in duas partes divisit: iv legiones in Senones Parisiosque Labieno ducendas dedit; vi ipse in Arvernos ad oppidum Gergoviam secundum flumen Elaver duxit: equitatus partem illi attribuit, partem sibi reliquit. Qua re cognita Vercingetorix omnibus interruptis ejus fluminis pontibus ab altera Elaveris parte iter facere coepit.

Cum uterque utrique esset exercitus in conspectu fereque e regione castris castra poneret, dispositis exploratoribus necubi effecto ponte Romani copias transducerent, erat in magnis Caesari difficultatibus res ne maiorem aestatis partem flumine impediretur, quod non fere ante autumnum Elaver vado transiri solet. Itaque, ne id accideret, silvestri loco castris positus e regione unius eorum pontium quos Vercingetorix rescindendos curaverat, postero die cum duabus legionibus in occulto restitit; reliquas copias cum omnibus impedimentis, ut consueverat, misit, captis quartis quibusque cohortibus uti numerus legionum constare videretur.

2. Translate either A or B.

A. Cicero, *pro rege Deiotaro*, §§ 22-24. Deiotarus' army was not directed against Rome.

De exercitu dicam breviter, ut cetera. Numquam eas copias rex Deiotarus habuit, quibus inferre bellum populo Romano posset, sed quibus fines suos ab excursionibus et latrociniis hostium tueretur et imperatoribus nostris auxilia mitteret. Atque antea quidem maiores copias alere poterat: nunc exiguas vix tueri potest. At misit ad Caecilium nescio quem: sed eos, quos misit, quod ire noluerunt, in vincula coniecit. Non quaero quam veri simile sit aut habuisse regem quos mitteret aut eos, quos misisset, non paruisse, aut, qui dicto audientes in tanta re non fuissent, eos vinctos potius quam necatos. Sed tamen cum ad Caecilium mittebat, utrum causam illam victam esse nesciebat an Caecilium istum magnum hominem putabat? quem profecto is, qui optime nostros homines novit, vel quia non nosset vel si nosset, contemneret. Addit etiam illud, equites non optimos misisse. Veteres, credo, Cæsar: nihil ad tuum equitatum, sed misit ex iis, quos habuit, electos. Ait nescio quem ex eo numero servum iudicatum. Non arbitror, non audivi: sed in eo, etiam si accidisset, culpam regis nullam fuisse arbitrarer.

B. Cicero, *Phil.*, XIV., §§ 22-24. The reasons why a supplication could not be decreed to Pansa and Hirtius.

Ex litteris enim C. Pansae A. Hirtii consulum, C. Caesaris pro praetore, de honore dis immortalibus habendo sententias dicimus. Supplicationem modo qui decrevit, idem imprudens hostes iudicavit. Numquam enim in civili bello supplicatio decreta est: decreta dico? ne victoris quidem litteris postulata est. Civile bellum consul Sulla gessit: legionibus in urbem adductis quos voluit expulit: quos potuit occidit: supplicationis mentio nulla. Grave bellum Octavianum insecutum est: supplicatio Cinnae nulla victori. Cinnae victoriam imperator ultus est Sulla: nulla supplicatio decreta a senatu. Ad te ipsum, P. Servili, num misit ullas collega litteras de illa calamitosissima pugna Pharsalia? num te de supplicatione voluit referre? Profecto noluit.

At misit postea de Alexandria, de Pharnace. Pharsaliae vero pugnae ne triumphum quidem egit. Eos enim cives pugna illa sustulerat, quibus non modo vivis, sed etiam victoribus incolumis et florens civitas esse posset. Quod idem contigerat superioribus bellis civilibus. Nam mihi consuli supplicatio nullis armis sumptis non ob caedem hostium, sed ob conversationem civium novo et inaudito genere decreta est.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

LATIN. (*Counted as three sections.*)

THIRD SECTION: LATIN POETS.

AUTUMN, 1897.—ONE AND THREE-QUARTER HOURS.

[Candidates must do A and either B or C.]

A.

1. Translate Ovid, *Metamm.*, VII., 297–321.

Medea, plotting Pelias's death, rejuvenates a ram.

Neve doli *cessent*, odium cum coniuge falsum
Phasias adsimulat Peliaeque ad limina supplex
confugit. atque illam, quoniam gravis ipse *senecta* est,
excipiunt natae. quas *tempore* callida parvo 300
Colchis amicitiae mendacis imagine cepit.
dumque refert inter meritorum maxima demptos
Aesonis *esse* situs atque hac in parte moratur,
spes est *virginibus Pelia* subiecta creatis
arte suum parili revirescere posse parentem. 305
idque petunt pretiumque iubent sine fine pacisci.
illa brevi *spatio* silet et dubitare videtur
suspenditque animos ficta gravitate rogantes
mox ubi pollicita est, '*Quo* sit fiducia maior
muneris huius,' ait, '*qui* vestras maximus *aevo* est 310
dux gregis inter oves, agnus medicamine fiet.'
protinus innumeris effetus laniger annis
attractitur flexo circum cava tempora *cornu*.
cuius ut Haemonia marcentia guttur cultro

fodit et exiguo maculavit sanguine ferrum, 315
 membra simul pecudis validosque venefica sucos
 mergit in aere cavo; minuunt en corporis artus
 cornuaque exurunt nec non cum cornibus annos,
 et tener auditur medio balatus aëno :
 nec mora, balatum *mirantibus* exilit agnus 320
 lascivitque fuga lactantiaque ubera quaerit.

2. Explain the grammatical construction of the words in italics.

B.

1. Translate Virgil, *Aen.*, V., 437–460.

Dares and Entellus box.

Stat gravis Entellus *nisuque* immotus eodem
 corpore tela modo atque oculis vigilantibus exit.
 ille velut celsam oppugnat qui molibus urbem
 aut montana sedet circum castella sub armis, 440
 nunc hos, nunc illos aditus omnemque pererrat
 arte locum et variis adsultibus inritus urguet.
 ostendit dextram insurgens Entellus et alte
 extulit: ille ictum venientem a vertice velox
 praevidit celerique elapsus corpore cessit. 445
 Entellus viris in ventum effudit et ultro
 ipse gravis graviterque ad terram *pondere* vasto
 concidit, ut quondam cava concidit aut Erymantho
 aut Ida in magna *radicibus* eruta pinus.
 consurgunt *studiis* Teuceri et Trinacria pubes ; 450
 it clamor *caelo*, primusque accurrit Acestes
 aequaevumque ab humo miserans attollit amicum.
 at non tardatus casu neque territus heros
 acrior ad pugnam redit ac vim suscitatur ira,
 tum pudor incendit viris et conscia virtus, 455
 praecipitemque Daren ardens agit *aequore* toto
 nunc dextra ingeminans ictus, nunc ille sinistra ;
 nec mora nec requies ; quam multa *grandine* nimbi
 culminibus crepitant, sic densis ictibus heros
 creber utraque manu pulsatur versaturque Daretas. 460

2. Explain the grammatical construction of the words in italics.

3. Scan vv. 437–441, marking the principal caesura in each.

C.

1. Translate Virgil, *Ecll.*, VI., 64–86.

Silenus sings of Gallus, Scylla and Philomela.

Tum canit errantem Permessi ad flumina Gallum
Aonas in montis ut *duxerit* una Sororum 65
utque *viro* Phoebi chorus adsurrexerit omnis ;
ut Linus haec illi, divino *carmine* pastor,
floribus atque apio crinis ornatus amaro,
dixerit : ‘ Hos tibi dant calamos, en accipe, Musae,
Ascraeo quos ante seni, quibus ille solebat 70
cantando rigidas deducere *montibus* ornos :
his tibi Grynei nemoris *dicatur* origo,
ne quis sit lucus, quo se plus *iactet* Apollo.’
Quid loquar aut Scyllam Nisi, quam fama secuta est
candida succinctam latrantibus *inguina* monstris 75
Dulichias *vexasse* rates et gurgite in alto,
ah, timidos nautas canibus lacerasse marinis,
aut ut mutatos Terei narraverit artus ;
quas illi Philomela dapes, quae dona pararit,
quo cursu deserta petiverit et quibus ante 80
infelix sua tecta supervolitaverit alis ?
Omnia, quae, Phoebo quondam meditante, beatus
audiit Eurotas iussitque ediscere laurus,
ille canit, pulsae referunt ad sidera valles,
cogere donec ovis stabulis numerumque referri 85
iussit et invito processit Vesper Olympo.

2. Explain the grammatical construction of the words in italics.

3. Scan vv. 64–68, marking the principal caesura in each.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

HISTORY. (*Counted as one section.*)

AUTUMN, 1897.—Two Hours.

GREEK HISTORY.

1. What is known of the history of Attica before the time of Solon? Into what classes were the people divided? Who were the Archons, and what were the duties of the Areopagus at this time?

2. For what purpose was the Confederacy of Delos formed? Under what circumstances was it dissolved?

3. Why was the battle of Arginusae so important for Athens? Give a brief outline of events from the time of the battle to the fall of Athens.

4. What gave rise to the Corinthian war, and who were engaged in it? Explain the peace of Antalcidas; when was it signed, and what were its terms?

5. How did Philip of Macedon treat the Grecian states after the battle of Chaeroneia?

ROMAN HISTORY.

1. Give an account of the reforms of Servius Tullius, explaining particularly the organisation of the Comitia Centuriata.

2. Compare the strength, resources, and government of Rome and Carthage. What causes led to the Punic Wars?

3. Of what importance were the wars with Jugurtha and Sertorius in the history of Marius? Give an account of Marius' military reforms.

4. Trace the career of Augustus Cæsar from the forming of the Second Triumvirate until the battle of Actium.

5. Who were the Germans? Mention any of the tribes that you can, and comment on such wars as you remember between the Germans and the Romans before the time of Theodosius (395 A.D.).

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

HISTORY. (*Counted as one section.*)

AUTUMN, 1897.—Two Hours.

ENGLISH HISTORY.

1. Discuss the local government of the Anglo-Saxons: explaining the organization of the shire, hundred, and town; and defining folkland.

2. What were the causes of the Hundred Years' War? When were the battles of Crecy and Poitiers fought, and with what result? Give the terms of the treaty of Bretigny.

3. Give an outline of the reformation in England under Henry VIII., Edward VI., and Mary.

4. Why was William of Orange called to the throne of England? Give the chief terms of the Act of Settlement.

5. Why did England join with France in the war in the Crimea against Russia? When did the war take place?

AMERICAN HISTORY.

1. Who were the Puritans? What settlements were made by them in North America?

2. In what various ways did Parliament try to tax the colonies between 1763 and 1775? Discuss the resistance which the colonists made to the tax on tea.

3. Why were Jefferson and the Democratic party successful in the election in 1801? Mention any important events in Jefferson's administrations.

4. Under what circumstances was Texas admitted to the Union? What were the causes of the war with Mexico?

5. Who were the abolitionists? Explain the principle of "squatter sovereignty," and show how it was applied in Kansas from 1854 to 1858.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

ENGLISH. (*Counted as one section.*)

I. GRAMMAR AND PUNCTUATION.

AUTUMN 1897.—ONE AND A HALF HOURS.

Correct the following sentences, making the corrections as far as possible on the printed text:

1. The vital importance of using antiseptics in surgery and the way in which it could be done was first indicated by Joseph Lister, who is a man who is justly venerated by the whole medical world, and who his sovereign has delighted to have honoured in a manner hitherto without precedent in this country.

2. I have intended for some time to have written to you, but I have been busy and had little time for writing. But I thought I ought to tell you that I will soon be leaving here as I thought you might know of someone to take my place. I hope we will meet again and thank you for all your kindness.

3. He is one of those men who believes firmly in the usefulness of variety in study, and that the freest scope possible should be given to the prevailing bent of every mind when it shows itself to be so predominating as to warrant it.

4. A letter from Hart Humber, a Canadian miner who went into the Klondike last spring, has been received, bearing the date of June 18th, and giving a number of intensely interesting facts which have not been printed and which throw light on many methods in the new camp.

5. There are then two ways of regarding Nature—as a machine and as a work. We will study it with awe if we come to it with the assumption that it is a creation; if we assume it be a system, with mere curiosity.

6. In the Duke of Cambridge's speech at the opening of a new operating ward at St. George's hospital, he maintains that medical and surgical science has made as great, if not greater progress during the prolonged reign of her majesty than any branch of study.

7. Neither Cochrane or Nelson would have thrown away their ship and their ship's company on a mere point of honour like Sir Richard Greville did the "*Revenge*," yet neither of them are counted as cowards in history.

8. If I myself was invited to pick out from all Trollope's books his best bit of writing I would put my hand upon the character of the ideal master of hounds in "Phineas Redux" without hesitation. But there can be no doubt but that the volumes which made him a public favorite were the famous Bassetshire series, beginning with "The Warden," and which end with "The Last Chronicles of Basset."

9. Kingsley was a Christian Socialist and a disciple of Carlyle, who was neither.

10. Critics of literature have not only called Dickens the Hogarth of literature but art critics as well. Like Hogarth he was always an artist and not a dauber; like Hogarth too his pictures are painted with a broad finish.

11. We will often hear it said by persons who condemn democracy that while the American people uses the word liberty with commendable frequency, they are not true lovers of it—failing to realise how few in their community really possess it.

12. Everyone, whatever they think of the opinions expressed in the "Apologia" must recognise the beauty of the style, that justly entitles its author to be considered in the first rank of English prose writers.

III. Punctuate (on the printed text) the following passage:

I cannot close my paper better than with the following quotation from Lowells Harvard Anniversary Address It is good for us to commemorate this homespun past of ours good in these days of a reckless and swaggering prosperity to remind ourselves how poor our fathers were and that we celebrate them because for themselves and their children they chose wisdom understanding and the things that are of God rather than any other riches This is our Founders Day and we are come together to do honour to them all first to the Commonwealth which laid our corner stone next to the gentle and godly youth from whom we took our name himself scarce more than a name and with them to the countless throng of benefactors rich and poor who have built us up to what we are We cannot do it better than in the familiar words Let us now praise famous men and our fathers that begat us The Lord hath wrought great glory by them through His great power from the beginning Their seed standeth fast and their children for their sake

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

ENGLISH. (*Counted as one section.*)

II. COMPOSITION.

AUTUMN, 1897.—TWO HOURS.

What seem to you to be the chief likenesses or differences between "As You Like It" and "The Merchant of Venice," as regards sources of interest, character drawing, setting, etc.?

The composition must contain not less than sixty lines of foolscap, and must be correct in grammar, punctuation, paragraphing, spelling, and general arrangement.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

SCIENCE. (*Counted as one section.*)

AUTUMN, 1897.—TWO HOURS.

PHYSICS.

1. What is adhesion? How does it differ from cohesion? How can the cohesion of a liquid be measured? Wherein do cohesion and adhesion differ from chemical affinity?

2. Explain what is meant by Newton's Third Law of Motion. Give numerous examples to illustrate, and explain why the velocity of the recoil of a gun is small compared with the velocity of the ball.

3. Give an account of the changes which take place in steam upon cooling it until ice is formed, noting especially any peculiarities in the behaviour described. Account for the heat given out by the substance upon condensing and freezing.

4. Describe the action of an electrophorus in producing a charge of electricity by induction.

5. Give an account of experiments which will illustrate the production of induced currents of electricity. Show that these principles have been utilised in the construction of a dynamo.

6. Explain how waves of sound originate and travel in air, defining pitch, wave-length and quality of sound.

7. What are the laws of refraction, and the index of refraction? Apply these laws to explain the formation of an image of an object by a lens.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

SCIENCE. (*Counted as one section.*)

AUTUMN, 1897.—TWO HOURS.

CHEMISTRY.

1. What are the names and formulas of the principal oxides of nitrogen? How are these oxides prepared, and how do they differ in properties?
2. How can chlorine gas be obtained from ordinary salt? What are the physical and chemical properties of chlorine? Give the formulas for potassium chloride, calcium chloride, and magnesium chloride.
3. What is formed when sulphur burns? How could you pass from sulphur to hydrogen sulphide?
4. What is an acid? a base? a salt? What is the commonest method of preparing acids, bases, and salts? Illustrate by writing the reactions involved in the preparation of nitric acid, sodium hydroxide, and sodium sulphate.
5. In what forms does the element carbon occur in nature? How could you prove that they are all different forms of the same element?

6. What is meant by the terms oxidation and reduction? Illustrate by equations.

7. When gaseous substances react to form gaseous products, what relation holds between the volumes of the reacting substances and that of the products? Illustrate with the volumes of nitrogen and hydrogen in a given volume of ammonia, and with the volumetric composition of water.

8. What is limestone? What is the reaction when limestone is burned to quicklime? When quicklime is slaked? When slaked lime hardens in mortar?

9. How is aluminium obtained from clay or the oxide Al_2O_3 ?

10. How many pounds of aluminium could be obtained from 100 pounds of Al_2O_3 ? ($\text{Al} = 27$, $\text{O} = 16$).

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

SCIENCE. (*Counted as one section.*)

AUTUMN, 1897.—TWO HOURS.

BOTANY.

1. How is the cell-wall formed? What modifications may take place?
2. Describe a cross-section of the leaf of a flowering plant.
3. What is chlorophyl? Where is it found? What does it do?
4. How are the leaves of flowering plants arranged on the stem?
5. What is a fibro-vascular bundle?

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

SCIENCE. (*Counted as one section.*)

AUTUMN, 1897.—TWO HOURS.

PHYSIOLOGY.

1. What did you have for breakfast this morning? How much of this material may be regarded as food? Why? Explain what you have done with these substances, following their history from the table to the pylorus, or entrance to the small intestine.
2. Structure and use of the skin.
3. Describe the eye and give a brief account of the use of each part.
4. Muscles. What kinds of muscle substance are known to you? Where are they found and what is the peculiar action and use of each?
5. Describe the blood and tell how it is useful to the well-being of the body.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

SCIENCE. (*Counted as one section.*)

AUTUMN, 1897.—TWO HOURS.

PHYSICAL GEOGRAPHY.

1. Explain annual and diurnal temperature variations.
2. What is the effect on air masses of these temperature variations? What influences modify the distribution of temperatures on the earth's surface? Give examples.
3. What laws govern the movements of the atmosphere? What is the origin of the atmosphere, its present function, composition, limits, and future?
4. What are the causes of condensation of moisture from the atmosphere, and in what forms is it condensed?
5. What constitutes climate? Explain climate of a middle western state, such as Wisconsin. What are the indications by means of which weather may be predicted?
6. How does the atmosphere produce color in the sky?
7. What would be the movements of the sea if there were no large bodies of land? Give causes for these movements.
8. Give any theories you may know for the formation of mountain ranges.
9. Explain the formation of oceanic islands.
10. How has the present crust of the earth been formed, and through what processes is it now passing?

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

GREEK. (*Counted as three sections.*)

FIRST SECTION: GRAMMAR AND COMPOSITION.

AUTUMN, 1897.

(*One hour if all three sections are taken; one and a half hours if only one or two sections are taken.*)

1. In the first prose passage give the principal parts of εἶπεν, ὄρας, ἀκούσας, ἴσθι. Decline δυνάμεως. Why is it genitive? Explain the ἄν after οἰόμεθα, the ἄν before πολλοῦ. Write in Greek the direct discourse of the sentence introduced by ἔφασαν.

2. Translate into Greek: The satrap wrote a letter to the king in order to persuade him to send money for his soldiers. Having been persuaded to do so, Darius sent a great deal of money, which was, however, stolen by the guides before it reached the satrap. Accordingly, the latter was obliged to escape from the city where he was besieged by the Greeks.

3. In the first Homeric passage give the Attic for the Homeric forms in the first six lines. Scan the last two lines of the same passage.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

GREEK. (*Counted as three sections.*)

SECOND SECTION: PROSE AUTHORS.

AUTUMN, 1897.

(*One hour if all three sections are taken; one and a half hours if only one or two sections are taken.*)

1. Translate:

Μετὰ τοῦτον Ἀθηναῖος εἶπεν· ὦ Φαλίνε, νῦν, ὡς σὺ ὄρᾳς, ἡμῖν οὐδὲν ἄλλο ἐστὶν ἀγαθὸν εἰ μὴ ὄπλα καὶ ἀρετὴ· ὄπλα μὲν οὖν ἔχοντες οἴομεθα ἂν καὶ τῇ ἀρετῇ χρῆσθαι· παραδόντες δ' ἂν ταῦτα καὶ τῶν σωμάτων στερηθῆναι. Μὴ οὖν οἴου τὰ μόνα ἡμῖν ἀγαθὰ ὄντα ὑμῖν παραδώσειν· ἀλλὰ σὺν τούτοις καὶ περὶ τῶν ὑμετέρων ἀγαθῶν μαχόμεθα. Ἀκούσας δὲ ταῦτα ὁ Φαλίνοσ ἐγέλασε καὶ εἶπεν· Ἀλλὰ φιλοσόφῳ μὲν ἔοικας, ὦ νεανίσκε, καὶ λέγεις οὐκ ἀχάριστα· ἴσθι μέντοι ἀνόητος ὢν, εἰ οἴει ἂν τὴν ὑμετέραν ἀρετὴν περιγενέσθαι τῆς βασιλέως δυνάμεως. Ἄλλουσ δὲ τινασ ἔφασαν λέγειν ὑπομαλακίζομένους ὡς καὶ Κύρῳ πιστοὶ ἐγένοντο καὶ βασιλεῖ γ' ἂν πολλοῦ ἄξιοι γένοιτο, εἰ βούλοιτο φίλος γενέσθαι· καὶ εἴτε ἄλλο τι θέλοι χρῆσθαι, εἴτ' ἐπ' Αἴγυπτον στρατεύειν, συγκαταστρέφαιντ' ἂν αὐτῷ.

2. Translate:

Ταῦτα ἀκούσαντες οἱ ἀμφὶ Ξενοφῶντα, ἐπεὶ ἠρίστησαν, συσκευασάμενοι ἐπορεύοντο, βουλόμενοι ὡς τάχιστα συμμίξαι τοῖσ ἄλλοισ εἰς Κάλπησ λιμένα. Καὶ πορευόμενοι ἐώρων τὸν στίβον τῶν Ἀρχάδων καὶ Ἀχαιῶν κατὰ τὴν ἐπὶ Κάλπησ ὁδόν. Ἐπεὶ δὲ ἀφίκοντο εἰς τὸ αὐτό, ἄσμενοί τε εἶδον ἀλλήλους καὶ ἠσπάζοντο ὡσπερ ἀδελφούς. Καὶ ἐπυρθάνοντο οἱ Ἀρχάδες τῶν περὶ Ξενοφῶντα τί τὰ πυρὰ κατασβέσειαν· ἡμεῖσ μὲν γάρ, ἔφασαν, φόμεθα ὑμᾶσ τὸ μὲν πρῶτον, ἐπειδὴ τὰ πυρὰ οὐχ ἐωρῶμεν, τῆσ νυχτὸσ ἤξειν ἐπὶ τοὺσ πολεμίουσ· καὶ οἱ πολέμοι δὲ, ὡσ γ' ἡμῖν ἐδόκουν, τοῦτο δεῖσαντες ἀπῆλθον· σχεδὸν γάρ ἀμφὶ τοῦτον τὸν χρόνον ἀπῆσαν.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

GREEK. (*Counted as three sections.*)

THIRD SECTION: HOMER.

AUTUMN, 1897.

(*One hour if all three sections are taken; one and a half hours if only one or two sections are taken.*)

1. Translate:

ὥς ἔφαθ', οἳ δ' ἄρα πάντες ἀχὴν ἐγένοντο σιωπῇ.
τοῖσι δὲ καὶ μετέειπε βοῆν ἀγαθὸς Μενέλαος·
“ κέχλυτε νῦν καὶ ἐμεῖο· μάλιστα γὰρ ἄλγος ἰκάνει
θυμὸν ἐμόν· φρονέω δὲ διακρινθήμεναι ἤδη
'Αργείους καὶ Τρῶας, ἐπεὶ κακὰ πολλὰ πέποισθε
εἶνεκ' ἐμῆς ἔριδος καὶ 'Αλεξάνδρου ἔνεκ' ἀρχῆς.
ἡμέων δ' ὑπποτέρῳ θάνατος καὶ μοῖρα τέτυκται,
τεθναίῃ· ἄλλοι δὲ διακρινθεῖτε τάχιστα.
οἴσατε δ' ἄρν', ἕτερον λευκόν, ἑτέρον δὲ μέλαιναν,
γῆ τε καὶ ἠελίω· Διὶ δ' ἡμεῖς οἴσομεν ἄλλον.
ἄξετε δὲ Πριάμοιο βίην, ὄφρ' ὄρκια τάμνη
αὐτός, ἐπεὶ οἱ παῖδες ὑπερφίαλοι καὶ ἄπιστοι·
μή τις ὑπερβασίῃ Λιδὸς ὄρκια δηλήσῃται.
αἰεὶ δ' ὑπλοτέρων ἀνδρῶν φρένες ἠερέθονται·
οἷς δ' ὁ γέρον μετέησιν, ἅμα πρόσσω καὶ ὀπίσσω
λεύσσει, ὅπως ὄχ' ἄριστα μετ' ἀμφοτέροισι γένηται.”

2. Translate:

ὥς ἔφατ', ἔδεισεν δὲ περὶ ξανθῆ Μενελάω.
τοῖς δ' αὖτις μετέειπε βοῆν ἀγαθὸς Διομήδης·
“ εἰ μὲν δὴ ἔταρόν γε κελεύετε μ' αὐτὸν ἐλέσθαι,
πῶς ἂν ἔπειτ' Ὀδυσῆος ἐγὼ θείοιο λαθοίμην,
οὐ πέρι μὲν πρόφρων κραδίη καὶ θυμὸς ἀγῆνωρ
ἐν πάντεσσι πόνοισι, φιλεῖ δέ εἰ Παλλὰς 'Αθήνη.
τούτου γ' ἐσπομένοιο καὶ ἐκ πυρὸς αἰθομένοιο
ἄμφω νοστήσαιομεν, ἐπεὶ περίοιδε νοῆσαι.”
τὸν δ' αὖτε προσέειπε πολύτλας δῖος Ὀδυσσεύς·
“ Τυδείδη, μήτ' ἄρ με μάλ' αἴνεε μήτε τι νείκει·
εἰδούσι γάρ τοι ταῦτα μετ' Ἀργείοις ἀγορεύεις.
ἀλλ' ἴομεν· μάλα γὰρ νῦν ἄνεται, ἐγγύθι δ' ἠώς.”

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION

FRENCH. (*Counted as three sections.*)

AUTUMN, 1897.—THREE HOURS.

I. GRAMMAR.

1. Put the following French sentence: *Je lui conseille d'écrire une lettre,*

(1) in a plural form (putting subject, object direct and indirect, and verb in the plural).

(2) in an interrogative form.

(3) in a negative form.

(4) in an imperative form (*i.e.* using the imperative mode).

(5) in an imperative negative form (*i.e.* using the imperative mode with a negation).

(6) Replace the present tense *conseille* by the perfect tense *ai conseillé* and give the sentence thus changed

(a) in an interrogative form.

(b) in a negative form.

2. Conjugate in full the present indicative of *pouvoir*, *vouloir*, *savoir*, *prévaloir*, *percevoir*.

3. Give the first person singular and plural of the preterite of *devenir*, *envoyer*, *moudre*, *coudre*.

4. Give the first person singular and plural of the subjunctive of *rire*, *luire*, *prendre*, *faire*, *peindre*, *se souvenir*, *sortir*, *absoudre*, *parcourir*, *pouvoir*.

5. Give the first person singular of the future of *savoir*, *devoir*, *craindre*, *feindre*, *entrevoir*, *courir*, *pourvoir*, *renvoyer*.

[OVER.]

6. Conjugate in full the imperative of *aller*, *devoir*, *assailir*, *parvenir*, *rire*, *vouloir*, *savoir*, *dire*, *se souvenir*, *souffrir*, *astreindre*.

(Each candidate will be required to pronounce some ten or fifteen lines of French to show her knowledge of French sounds. This is an integral part of the examination.)

II. TRANSLATION.

J'étais désolé de ma lourdisse et de ne pouvoir justifier aux yeux de madame de Broglie ce qu'elle avait fait en ma faveur. Après le dîner, je m'avisai de ma ressource ordinaire. J'avais dans ma poche une épître en vers, écrite à Parisot pendant mon séjour à Lyon. Ce morceau ne manquait pas de chaleur ; j'en mis dans la façon de le réciter, et je les fis pleurer tous trois. Soit vanité, soit vérité dans mes interprétations, je crus voir que les regards de madame de Broglie disaient à sa mère : " Eh bien, maman, avais-je tort de vous dire que cet homme était plus fait pour dîner avec vous qu'avec vos femmes ? " Jusqu'à ce moment j'avais eu le cœur un peu gros ; mais après m'être ainsi vengé, je fus content. Madame de Broglie, poussant un peu trop loin le jugement avantageux qu'elle avait porté de moi, crut que j'allais faire sensation dans Paris.

Le soir approchait ; ramenés de bon heure, pour éviter la rosée, les moutons étaient enfermés dans la bergerie ; la claire-voie était posée, et le troupeau lassé, grisé d'air pur et d'herbe tendre, s'était couché dans la bonne litière sèche ; les dos arrondis, les flancs laineux faisaient de petits monticules jaunâtres, doux à l'œil. Un rayon de soleil couchant se glissait par la fenêtre à l'ouest et se posait sur la pierre qui servait de banc.

La religieuse, fille d'un médecin juif converti au christianisme, appartenait à une race très adonnée aux arts de l'astrologie et de la magie, et passait pour initiée elle-même aux sciences occultes, fort en vogue au moyen âge. Frappée de l'air franc et martial de l'enfant, elle le fit approcher,

examina attentivement les traits de son visage et les lignes de sa main, et, prenant à l'écart sa mère, encore tout émue et courroucée, elle lui dit qu'elle avait lieu de s'enorgueillir d'avoir mis au monde ce garçon, qu'il serait un jour l'honneur de sa maison et la gloire de son pays. A cette parole, le cœur de la dame du Guesclin, bien que doutant encore, tressaillit de joie: elle regarda son fils d'un autre œil; en remplaça sa garda-robe en guenilles par des vêtements plus convenables à son rang, et commanda à tous ses domestiques de respecter désormais en Bertrand le fils aîné de leur seigneur.

J'eus de la peine à ouvrir la porte rouillée et déjetée. On avait mis des fagots dans le chœur pour masquer l'autel et le préserver de profanations que, du reste, personne de chez nous n'avait songé à commettre. La voûte dégradée était toute noircie par l'humidité. La grêle avait cassé les carreaux. Les pigeons étaient entrés et s'étaient réfugiés là, contre les enfants du village que la faim poussait à les poursuivre à coups de pierres.

Compère le renard se mit un jour en frais,
Et retint à dîner commère la cigogne.
Le régal fut petit et sans beaucoup d'apprêts:
Le galant pour toute besogne,
Avait un brouet clair; il vivait chichement.
Ce brouet fut par lui servi sur une assiette:
La cigogne au long bec n'en put attraper miette;
Et le drôle eut lapé le tout en un moment.
Pour se venger de cette tromperie,
A quelque temps de là, la cigogne le prie.
"Volontiers, lui dit-il; car avec mes amis
Je ne fais point cérémonie."
A l'heure dite, il courut au logis
De la cigogne son hôtesse;
Loua très fort sa politesse;
Trouva le dîner cuit à point:
Bon appétit surtout; renards n'en manquent point.

Il se réjouissait à l'odeur de la viande
Mise en menus morceaux et qu'il croyait friande.
On servit, pour l'embarrasser,
En un vase à long col et d'étroite embouchure.
Le bec de la cigogne y pouvait bien passer,
Mais le museau du sire était d'autre mesure.
Il lui fallut à jeun retourner au logis,
Honteux comme un renard qu'une poule aurait pris,
Serrant la queue, et portant bas l'oreille.
Trompeurs, c'est pour vous que j'écris;
Attendez-vous à la pareille.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

GERMAN. (*Counted as three sections*).

AUTUMN, 1897. THREE HOURS.

I. GRAMMAR.

1. Give (together with the article) the genitive singular and the nominative plural of the nouns:

Auge (n.)	Pfahl (m.)
Fabel (f.)	Schuh (m.)
Gedanke (m.)	Strahl (m.)
Graf (m.)	That (f.)
Kloster (n.)	Wand (f.)
Nest (n.)	Wurm (m.)

2. Decline "das alte Haus" and "ein altes Haus."

3. Give in the third person singular, (1) the present indicative, (2) the preterit, (3) the preterit subjunctive, and 4) the past participle of the following verbs:

abschwören	geschehen
anschneiden	hauen
ausdenken	vergeltten
bedürfen	vorliegen
erfahren	walten
frieren	zurückstehen

II. TRANSLATION.

Translate the following passages, leaving blank spaces for the words that you do not remember:

1.

Sie sah ihn mit einem Lächeln des Dankes an, das gleich hinter vorquellenden Thränen sich verdunkelte. Verzeihen Sie es meinem schwer erschütterten Herzen, sagte sie, wenn ich mich noch nicht wieder ins Helle gewöhnen kann. Ich habe einen zu harten Sturm durchlebt, und der Boden schwankt mir noch unter den Füßen. Morgen werde ich mich schon besser aufführen.

Darauf versanken sie wieder beide in ihr Schweigen und sahen auf den See hinaus, über dem die tiefste Mittagschwüle brütete. Eine Grille zirpte in dem Gärtchen hinterm Haus, man hörte von der Ofenbank drinnen das Schnarchen des Wirts und aus der Schiffshütte das Glucksen der Wellen an den leisegeschaukelten Kähnen, und dicht nebenan in der Krankenstube sang die Wärterin dem Kinde ein halblautes Schlaflied, womit sie es schon vor Jahren in der Wiege eingelullt hatte.

Auf den stillen Tag folgte eine unruhige Nacht. Das Fieber wurde wieder heftiger, das Kind stöhnte viel und war nur schwer im Bette zu halten. Erst um Mitternacht wurde es ruhiger.

Der Doctor hatte sich keine zehn Schritte vom Hause entfernt. Nur gegen Abend war er ins Freie gegangen, eine Cigarre zu rauchen. Da machte er die Runde um das Haus, und jedesmal wenn er an das offene Fenster des Krankenzimmers kam, stand er einen Augenblick still und sprach ein ermutigendes Wort zu der Mutter, die nicht von dem Bette wich.

(Heyse.)

2.

Itzigs verschmitzter Bursch öffnete die Thür. Anton stand seinem Schulkameraden gegenüber. Der Agent wusste bereits, dass Anton von dem Gut bei Rosmin nach der Stadt zurückgekehrt war, und hatte sich auf diesen Besuch vorbereitet. Einen Augenblick betrachteten die beiden Männer einander, Beide bemüht, in Gesicht und Haltung des Gegners zu lesen und sich zu dem beginnenden Kampf zu rüsten. Beiden hatte ein vieljähriger vorsichtiger Verkehr

mit Menschen und den Interessen des Handels einiges Gleichartige gegeben. Beide waren gewöhnt, den Schein kaltblütiger Ruhe zu behaupten und das Ziel, das sie erreichen wollten, zu verbergen, Beide waren gewöhnt an schnelle Ueberlegung, an behutsames Sprechen, an kühle Haltung, Beide zeigten auch in Sprache und Geberde etwas von der Form, welche der kaufmännische Verkehr dem Geschäftsmann verleiht, Beide waren heut in einer grossen innern Aufregung, welche die Wange Antons rötete und die Backenknochen Veitels mit einem hellen Schimmer überzog. Aber dem klaren Blick Antons begegnete das Auge des Gegners unruhig und lauernd, dem herben Ernst seiner Haltung eine Mischung von Trotz und Unterwürfigkeit ; Beide erkannten im ersten Augenblick, dass der Gegner gefährlich und schwer zu besiegen sei, und Beide sammelten ihre ganze Kraft.

(Freytag.)

3.

Es war ein schlimmes Verhängnis für die deutsche Bewegung, dass ihre ersten Erfolge mit einer so unglaublichen Leichtigkeit vor sich gingen. Aus der freudigen Ueberraschung ist es erklärlich, wie nun der Lauf der Begebenheiten jenen gemüthlichen Austrich nahm, der für den tiefer Blickenden etwas Unheimliches hatte, weil er gleich dem lockern Schnee über klaffenden Felsspalten die ernsthaften Probleme verdeckte, die der Staat zu lösen hatte, wenn er nicht daran untergehn sollte. In der Erinnerung an die grosse französische Revolution, deren Gang dem Anschein nach ausschliesslich durch die Reihe der aufeinander folgenden gesetzgebenden Versammlungen bestimmt wurde, war man fest überzeugt, dass für Deutschland etwas Aehnliches möglich sei, und zweifelte nicht daran, dass durch den Verein der edelsten Männer Deutschlands, die sich selbst für souverän erklärten, sofort die ideale Verfassung Deutschlands verwirklicht werden müsse. Man vergass, dass die französische Nationalversammlung eine fertige Staatsmaschine vorfand, der sie leicht die angemessene Richtung geben konnte, während die deutsche Nationalversammlung den Staat erst schaffen sollte.

(Julian Schmidt.)

4.

Wohl flog mit roten Wipfeln einst
Mein Schiff in junger Zeit;
Dann kamen Sturm und Wetter,
Da trug ich schweres Leid.

Doch wie der frühe goldne Traum
Zerging des Kummers Last;
Nun schau'ich nach den Sternen
Vom Steuer, erst gefasst.

Was immer kam, ich hab's erkannt,
Am letzten war es gut;
Das hat mein Herz gegürtet
Mit einem festen Mut.

Fahr zu, mein Schiff, fahr fröhlich zu
Durch Glanz und Nebelrauch !
In deinen raschen Segeln
Der Wind ist Gottes Hauch.

(*Geibel.*)

BRYN MAWR COLLEGE.

EXAMINATION FOR ADVANCED STANDING.

SOLID GEOMETRY.

AUTUMN, 1897.—TWO HOURS.

(When this paper is taken with Trigonometry, the time allowed is one and a half hours; questions 1 and 3 are then to be omitted and the reason for the omission is to be stated.)

1. Define parallel straight lines; how do they differ (a) from intersecting, (b) from non-intersecting straight lines? Prove that straight lines which are parallel to the same straight line are parallel to one another.

2. Prove that to two straight lines in space not in the same plane one common perpendicular can be drawn, and this will be the shortest line joining the given lines.

3. Prove that in a trihedral angle the sum of any two face angles is greater than the third face angle.

4. Prove that the planes which contain each an edge of a tetrahedron and the bisection of the opposite edge pass through one point. How many such planes are there?

5. Prove that pyramids of equal bases and equal altitudes are equal in volume. Explain exactly how this proposition can be extended to cones.

6. Prove that if two spheres intersect, they intersect in a circle whose plane is at right angles to the line joining the centres of the spheres.

7. Give and prove the expression for the volume of a sphere in terms of the radius.

8. Explain what is meant by polar triangles on a sphere. State and prove the relations connecting the sides and angles of polar triangles.

BRYN MAWR COLLEGE.

EXAMINATION FOR ADVANCED STANDING.

TRIGONOMETRY.

AUTUMN, 1897.—TWO HOURS.

(When this paper is taken with Solid Geometry, the time allowed is one and a half hours; questions 1 and 6 are then to be omitted and the reason for the omission is to be stated.)

1. Prove that

(i.)

$$\cot^2 30^\circ + 2 \cos^2 60^\circ = 2 \cot^2 45^\circ + \frac{\cos^2 30^\circ}{1 - \cos^2 30^\circ} - \frac{3}{4} \operatorname{Cosec}^2 45^\circ;$$

(ii.) $\tan (45^\circ + A) + \tan (45^\circ - A) = \frac{2}{\cos 2A}.$

2. Give definitions of the Sine and Cosine of an angle that will apply to angles of all magnitudes.

Prove that

$$\sin A = \frac{2 \tan \frac{A}{2}}{1 + \tan^2 \frac{A}{2}}$$

Find an expression for $\cos A$ in terms of $\tan \frac{A}{2}.$

3. Prove that

(i.) $(\cos A)^4 - (\sin A)^4 = \cos 2A;$

(ii.) $\frac{\sin A + 2 \sin 4A + \sin 7A}{\sin 5A + 2 \sin 8A + \sin 11A} = \frac{1}{2 \cos 4A}.$

4. Prove that in a triangle A B C

$$(i.) \frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c};$$

$$(ii.) c \sin A = a \sin (A + B).$$

5. Given $\log 2 = .30103$, $\log 3 = .47712$,

find $\log \sin 45^\circ$, $\log \cot 60^\circ$, $\log \cos 30^\circ$.

Prove that

$$(83)^{\frac{1}{3}} \times (61)^{\frac{4}{5}} = 37.6$$

approximately, given

$$\log 376 = 2.57519, \log 830 = 2.91908, \log 610 = 2.78533.$$

6. Prove that $\tan 75^\circ + \cot 75^\circ = 4$.

7. State and prove the rules by means of which you can determine by inspection the integral part of the Logarithm of any given number.