Matriculation Exams

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1896

Bryn Mawr College Examination Papers Set for Matriculation in September, 1896

Bryn Mawr College

BRYN MAWR COLLEGE.

EXAMINATION PAPERS

SET FOR MATRICULATION

IN

SEPTEMBER, 1896.

Boston   miss Winsor; St. Botolph Gymnasium
          Clarendon St.
new York   miss Putnam; Y.M.C.A.
          23rd Str
Canandaigua   miss Moser
Philadelphia   miss Neelson Y.M.C.A.
Baltimore   mrs. Carey; Y.W.C.A.
          Gymnasium.
Pittsburg   miss Gates.
          red
Chicago   miss Furness.
Louisville   miss Neville
          218 W. Main St Lexington
Detroit   mrs. Robbins.
Indianapolis   miss Atkins
Portland   miss Bartlett
          gone
London   mrs. Russell. 44 Grosvenor Road
London
Calgary   . mrs. Cox

BRYN MAWR COLLEGE.

EXAMINATIONS FOR MATRICULATION.

Examinations for matriculation in Bryn Mawr College are held at the college during the week preceeding 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 1897 examinations for matriculation will be held from May 28th to June 2d, inclusive, at Bryn Mawr College, and also in Boston, New York, Philadelphia, Baltimore, Pittsburg, Chicago, Louisville, Indianapolis, and Portland, Oregon, and College Park, California, and also 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.

Applications for admission to examinations elsewhere than at Bryn Mawr College must be made at least one month 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, 1897.	AUTUMN, 1897.
MAY 28.	SEPTEMBER 20.
English Grammar, etc., ... 9½—11	English Grammar, etc., . . . 9½—11
English Composition, ... 11—1	English Composition, ... 11—1
Geometry . . . . 2½—5	Geometry . . . . . . 2½—5
	21.
Algebra, ... 9—12	Algebra, ... 9—12
French, ... 2—5	French, ... 2—5
	22.
Latin Prose Authors . . . 9—10¾	Latin Prose Authors, . . 9—10¾
Latin Poets . . . . . 11¼—1	Latin Poets, ... 11¼—1
Science, ... 3—5	Science, ... 3—5

SPRING, 1897.
JUNE 1.

Latin Composition, ... 9—10½
History, ... 11—1
German, ... 2½—5½

2.

Greek, ... 9—12
Solid Geometry
    and Trigonometry, ... 2—5

AUTUMN, 1897.
23.

Latin Composition, ... 9—10½
History, ... 11—1
German, ... 2½—5½

24.

Greek, ... 9—12
Solid Geometry
    and Trigonometry, ... 2—5

SPRING, 1898.
MAY 27.

English Grammar, etc., . . 9½—11
English Composition, ... 11—1
Geometry, ... 2½—5

28.

Algebra, ... 9—12
French, ... 2—5

30.

Latin Prose Authors, ... 9—10¾
Latin Poets, ... 11¼—1
Science, ... 3—5

31.

Latin Composition, ... 9—10½
History, ... 11—1
German, ... 2½—5½

JUNE 1.

Greek, ... 9—12
Solid Geometry
    and Trigonometry, ... 2—5

AUTUMN, 1898.
SEPTEMBER 26.

English Grammar, etc., . . 9½—11
English Composition, ... 11—1
Geometry, ... 2½—5

27.

Algebra, ... 9—11
French, ... 2—5

28.

Latin Prose Authors, ... 9—10¾
Latin Poets, ... 11¼—1
Science, ... 3—5

29.

Latin Composition, ... 9—10½
History, ... 11—1
German, ... 2½—5½

30.

Greek, ... 9—12
Solid Geometry
    and Trigonometry, ... 2—5

MID-YEAR, 1898.*

JANUARY 31.

English Grammar, etc., . . 9½—11
English Composition, ... 11—1
Geometry, ... 2½—5

FEBRUARY 1.

Algebra, ... 9—12
French, ... 2—5

2.

Latin Prose Authors, ... 9—10¾
Latin Poets, ... 11¼—1
Science, ... 3—5

3.

Latin Composition, ... 9—10½
History, ... 11—1
German, ... 2½—5½

4.

Greek, ... 9—12
Solid Geometry and Trigonometry, 2—5

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

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 that 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 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 Mathmetics, 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 will offer 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 and New Jersey ; (*c*) Ohio, Indiana, Illinois, Michgian, 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 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 :

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.

BERTHA HAVEN PUTNAM, A.B., 225 *West 75th Street*, NEW YORK CITY.

MARGARET THOMAS CAREY, A.B., (MRS. ANTHONY MORRIS CAREY), 835 *Eutaw Street*, BALTIMORE, MARYLAND.
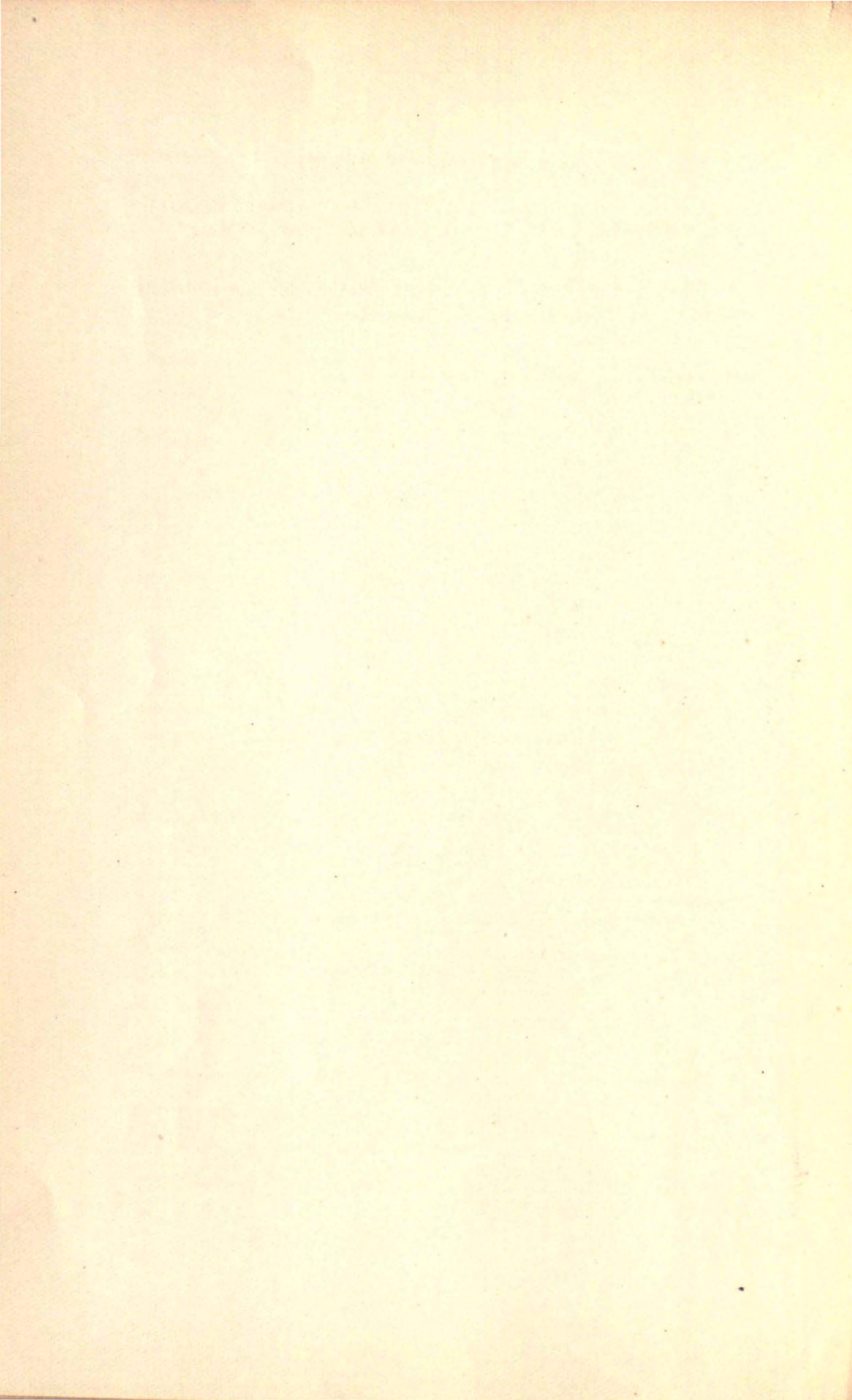
CATHARINE BEAN COX, A.B., (MRS. ISAAC M. COX), TULARE, TULARE
    COUNTY, CALIFORNIA.

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.

    January, 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.
Mathematics { 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.
Greek { Gram. and Comp., 1. Sight reading in Greek prose, 1. Sight reading in Greek poetry, 1. *and* *French* { Grammar, Prose, } 3. Poetry,	*Greek* *or* *and* *German* { Gram. and Comp., 1. Sight reading in Greek prose, 1. Sight reading in Greek poetry, 1. { Grammar, Prose, } 3. Poetry,	*French* { Grammar, Prose, } 3. Poetry, *or* *and* *German* { 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 :

Advanced } Solid Geometry,
Mathematics } Plane Trigonometry.

A fourth language, { *Greek* (as above)
or
French (as above)
or
German (as above)

---

*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 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.

C. Smith's *Elementary Algebra*, 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.

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 1896 candidates must be familiar with Chaucer's *Prologue* to the Canterbury Tales ; Shakespeare's *Tempest* and *As You Like It;* Milton's *Comus* and *Lycidas ;* 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.*

In 1897 candidates must be familiar with Chaucer's *Clerk's Tale ;* Shakespeare's *Merchant of Venice* and *As You Like It;* Milton's *Samson Agonistes, L'Allegro, Il Penseroso* and *Lycidas ;* 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;* Keats's *Eve of St. Agnes;* Shelley's *Adonais* and *Sensitive Plant;* Coleridge's *Ancient Mariner* and *Christabel.*

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.*

The books recommended for the years 1896, 1897, and 1898, 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.

Gage's *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 or Chemistry, as these studies form 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 will have 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 cannot 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 will be 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 cannot 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

IN

SEPTEMBER, 1896.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

ALGEBRA. (*Counted as two sections.*)

1. Divide $a^6 + b^6$ by $a^2 + b^2$ and find the square of the quotient.

2. Solve the equations

(i.) $\quad 3 - \dfrac{x}{4} = \dfrac{1}{2}\left(4 - \dfrac{x}{3}\right) - \dfrac{5}{6},$

(ii.) $\quad \dfrac{x - \frac{1}{x}}{x + 1} + \dfrac{1}{2x} = \dfrac{1}{2},$

(iii.) $\quad 2\sqrt{x} + 3\sqrt{y} = 3\sqrt{x} + 2\sqrt{y} = 10.$

3. Two persons, A and B, own together 175 shares in a railway company. They agree to divide, and A takes 85 shares, while B takes 90 shares, and pays A 500 dollars. What is the value of a share?

4. Multiply together

$$x^3 - 99x^2 + x - 29 \text{ and } x^5 - 17x^4 + 105x^3 - 19x^2 + 23x - 41,$$

and arrange the product in descending powers of x.

Write down the coefficient of x^5 in the product of

$$ax^6 + bx^5 - cx^4 + dx^2 - ex - f$$
$$\text{by}$$
$$ux^4 + vx^2 + w$$

without actual multiplication, and show how the result is obtained.

5. Define the terms *ratio, proportion, duplicate ratio.* If

$$a : b = c : d,$$

prove that

$$a^2 + b^2 : a^2 - b^2 = c^2 + d^2 : c^2 - d^2.$$

6. Prove that

$$n^2 + 2n \left[1 + 2 + 3 + \ . \ . \ . \ + (n - 1) \right] = n^3.$$

The third term of an arithmetic progression is four times the first term, and the sixth term is 17. Find the series.

7. Simplify

$$\frac{4}{x^2 + x} + \frac{2x - 5}{x^2 - x + 1} - \frac{2x^2 - 11}{x^3 + 1}.$$

8. Show that a quadratic equation cannot have more than two roots. Find the values of a for which the equation $a^2 x^2 + (a^2 + a) x + 1 = 0$ will have its roots equal.

9. Find an equation of the first degree in two variables x and y such that when $x = 2$, $y = 5$, and when $x = 9$, $y = 3$.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

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

SEPTEMBER, 1896.—TWO AND A HALF HOURS.

1. Show how to draw a perpendicular from a given point to a given line, the point not lying on the line. Show that only one such perpendicular can be drawn.

2. Prove that if two parallel lines are cut by a third straight line, the two interior angles on one side of the transversal are together equal to two right angles.

Prove that the lines bisecting the angles of a parallelogram form a rectangle.

3. Define a parallelogram; prove that the opposite sides and angles are equal, and that the diagonals bisect one another.

Prove that *any* line through the intersection of the diagonals of a parallelogram bisects the figure.

4. Prove that in any circle angles at the centre have the same ratio as the arcs on which they stand.

Show how to divide the circumference of a circle into three parts that shall be in the ratio 1 : 2 : 3.

5. Prove that an angle formed by two chords intersecting within a circle is measured by one-half the sum of the intercepted arcs.

ABCD is a quadrilateral in a circle ; P, Q, R, S, are the points of bisection of the arcs AB, BC, CD, DA. Show that PR is perpendicular to QS.

6. Prove that the sum of the squares of two sides of a triangle is equal to twice the square of half the base increased by twice the square of the distance from the vertex to the bisection of the base.

Apply this to find a line whose extremities shall lie one on each of two given concentric circles, the line itself being bisected at a given point.

7. Prove that the three lines drawn through the vertices of a triangle to bisect the opposite sides meet in a point, and determine the position of this point on any one of the three bisectors.

Show how to construct a triangle when the lengths of the three medians are given.

8. Define the tangent to a circle at a point; and prove that the tangent at a point is perpendicular to the diameter through the point.

Two circles whose centres are A, B, meet at a point P. Prove that if AP touch the circle whose centre is B, then BP will touch the circle whose centre is A.

9. State and prove the relation between the segments of intersecting chords of a circle. Apply this to find a mean proportional to two given lines.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

LATIN. (*Counted as three sections.*)

FIRST SECTION: GRAMMAR AND PROSE COMPOSITION.
SEPTEMBER, 1896.—ONE AND A HALF HOURS.

1. Give the "general rules for gender," with examples from the first and second declensions when these rules over-ride the termination. Decline *femur*, thigh, *senex*, old man. What is the rule for the termination of the Gen. Pl. in the third declension? Decline *totus*, whole. How are compound numerals formed? Give the principal parts of *consulere, emere, manere, potiri, vincire.*

2. Give three rules of concord. How does the Latin express *may, can, ought,* etc.? What is the Negative Imperative? What is the difference between the Ablative and Genitive of quality or characteristic? Give a brief synopsis of the Syntax of the Ablative.

3. Translate into Latin:

A war broke out [1] between the Carthaginians [2] and the Romans which lasted [3] seventeen years. Hannibal, the Carthaginian general, conquered the Romans in many battles, because the Romans did not know how to oppose a man who was superior [4] in cavalry and who was always using ambuscades [5]. But his enemies at home envied Hannibal and would not send any soldiers to his assistance [6]. So at last, having lost so many men that he could no longer resist the Romans, he was compelled [7] to return to Africa. Then the Romans crossed over into Africa to destroy Carthage. Hannibal met [8] them at Zama, and after a fierce battle was defeated. The Romans shortly afterwards made peace with the Carthaginians, but ordered them to pull down [9] their walls and to give up Spain.

[1] exorire. [2] Poenus. [3] durare. [4] plus valere. [5] insidiæ.
[6] auxilium. [7] cogere. [8] obviam ire. [9] dirimere.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

LATIN. *(Counted as three sections.)*

SECOND SECTION: PROSE AUTHORS.

SEPTEMBER, 1896.—TWO HOURS.

I. Translate *Nepos*, XXIII., 2.

Hannibal explains to King Antiochus how he swore eternal enmity to Rome.

Nam ut omittam Philippum, quem absens hostem reddidit Romanis, omnium his temporibus potentissimus rex Antiochus fuit. hunc tanta cupiditate incendit bellandi, ut usque a rubro mari arma conatus sit inferre Italiae. ad quem cum legati venissent Romani, qui de eius voluntate explorarent darentque operam consiliis clandestinis ut Hannibalem in suspicionem regi adducerent, tamquam ab ipsis corruptum alia atque antea sentire, neque id frustra fecissent, idque Hannibal comperisset seque ab interioribus consiliis segregari vidisset, tempore dato adiit ad regem, eique cum multa de fide sua et odio in Romanos commemorasset, hoc adiunxit: " Pater meus," inquit, " Hamilcar puerulo me, utpote non amplius novem annos nato, in Hispaniam imperator proficiscens Carthagine Iovi optimo maximo hostias immolavit. quae divina res dum conficiebatur, quaesivit a me, vellemne secum in castra proficisci. id cum libenter accepissem atque ab eo petere coepissem, ne dubitaret ducere, tum ille ' Faciam, inquit, si mihi fidem, quam postulo, dederis.' simul me ad aram adduxit, apud quam sacrificare instituerat, eamque ceteris remotis tenentem iurare iussit, numquam me in amicitia cum Romanis fore. id ego iusiurandum patri datum usque ad hanc

aetatem ita conservavi, ut nemini dubium esse debeat, quin reliquo tempore eadem mente sim futurus, quare si quid amice de Romanis cogitabis, non imprudenter feceris, si me celaris; cum quidem bellum parabis, te ipsum frustraberis, si non me in eo principem posueris."

II. Translate either one of the following:

a. Cicero *de Officiis*, III., 31, 112: the story of Torquatus.

L. Manlio A. f., cum dictator fuisset, M. Pomponius tr. pl. diem dixit, quod is paucos sibi dies ad dictaturam gerendam addidisset; criminabatur etiam, quod Titum filium, qui postea est Torquatus appellatus, ab hominibus relegasset et ruri habitare iussisset. Quod cum audivisset adulescens filius, negotium exhiberi patri, occurrisse Romam et cum primo luci Pomponi domum venisse dicitur. Cui cum esset nuntiatum, qui illum iratum allaturum ad se aliquid contra patrem arbitraretur, surrexit e lectulo remotisque arbitris ad se adulescentem iussit venire. At ille, ut ingressus est, confestim gladium destrinxit iuravitque se illum statim interfecturum, nisi ius iurandum sibi dedisset se patrem missum esse facturum. Iuravit hoc terrore coactus Pomponius; rem ad populum detulit, docuit, cur sibi causa desistere necesse esset, Manlium missum fecit. Tantum temporibus illis ius iurandum valebat. Atque hic T. Manlius is est, qui ad Anienem Galli, quem ab eo provocatus occiderat, torque detracto cognomen invenit, cuius tertio consulatu Latini ad Veserim fusi et fugati, magnus vir in primis et, qui perindulgens in patrem, idem acerbe severus in filium.

b. Cicero *pro Sestio* VI., 144, 145; the appeal to the judges for Sestius.

Sed me repente, iudices, de fortissimorum et clarrissimorum civium dignitate et gloria dicentem et plura etiam dicere parantem horum aspectus in ipso cursu orationis repressit. Video P. Sestium, meae salutis, vestrae auctoritatis, publicae causae defensorem, propugnatorem, actorem, reum; video hunc praetextatum euis filium oculis lacrimantibus me intuentem; video T. Milonem, vindicem

vestrae libertatis, custodem salutis meae, subsidium adflictae rei publicae, extinctorem domestici latrocinii, repressorem caedis cotidianae, defensorem templorum atque tectorum, praesidium curiae, sordidatum et reum; video P. Lentulum, cuius ego patrem deum ac parentem statuo fortunae ac nominis mei et fratris liberorumque nostrorum, in hoc misero squalore et sordibus; cui superior annus idem et virilem patris et praetextam populi iudicio togam dederit, hunc hoc anno in hac toga rogationis iniustissimae subitam acerbitatem pro patre fortissimo et clarissimo cive deprecantem. Atque hic tot et talium civium squalor, hic luctus, hae sordes susceptae sunt propter unum me, quia me defenderunt, quia meum casum luctumque doluerunt, quia me lugenti patriae, flagitanti senatui, poscenti Italiae, vobis omnibus orantibus reddiderunt. Quod tantum est in me scelus? quid tanto opere deliqui illo die, cum ad vos indicia, litteras, confessiones communis exitii detuli, cum parui vobis?

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

LATIN. (*Counted as three sections.*)

THIRD SECTION: LATIN POETS.

SEPTEMBER, 1896.—TWO HOURS.

[*Candidates must take A and either B or C.*]

A.

1. Translate Ovid, *Metamm.*, 8, 210-235. The death of Icarus.

inter opus monitusque genae maduere seniles	210
et patriae tremuere manus. dedit oscula nato	
non iterum repetenda suo *pennis*que levatus	
ante volat *comit*ique timet, velut ales, ab alto	
quae teneram prolem produxit in aera nido,	
hortaturque sequi damnosasque erudit *artes*	215
et movet ipse suas et nati respicit alas.	
hos aliquis, tremula dum captat harundine pisces	
aut pastor *baculo* stivave innixus arator,	
vidit et obstipuit quique aethera carpere *possent*	
credidit esse deos. et iam Iunonia laeva	220
parte Samos, fuerant Delosque Parosque relictae,	
dextra Lebinthus erat fecundaque *melle* Calymne,	
cum puer audaci coepit gaudere *volatu*	
deseruitque ducem caelique cupidine tractus	
altius egit iter. rapidi vicinia solis	225
mollit odoratas, pennarum vincula, ceras.	
tabuerant cerae: nudos quatit ille lacertos	
*remigio*que carens non ullas percipit auras	
ɔraque caerulea patrium clamantia nomen	
excipiuntur aqua, quae nomen traxit ab illo.	230
at pater infelix nec iam pater 'Icare' dixit,	

'Icare' dixit 'ubi es? qua te regione *requiram?'*
'Icare' dicebat: pennas adspexit in undis
devovitque suas artes corpusque *sepulcro*
condidit, et tellus a nomine dicta sepulti.   235

2. Explain the grammatical construction of the italicized words.

B.

1. Translate Virgil, *Aen.*, 12, 81-106.   Turnus's zeal for war.

Haec ubi dicta dedit rapidusque in tecta recessit,
poscit equos gaudetque tuens ante ora frementis,
Pilumno quos ipsa decus dedit Orithyia,
qui *candore* nives *anteirent,* cursibus auras.
circumstant properi aurigae manibusque lacessunt   85
pectora plausa cavis et colla comantia pectunt.
ipse dehinc auro squalentem alboque orichalco
circumdat loricam *humeris,* simul aptat *habendo*
ensemque clipeumque et rubrae cornua cristae—
ensem quem Dauno ignipotens deus ipse parenti   90
fecerat et Stygia candentem tinxerat *unda.*
exin, quae mediis ingenti adnixa *columnae*
aedibus adstabat, validam vi corripit hastam,
Actoris Aurunci spolium, quassatque trementem
vociferans: Nunc, o numquam frustrata vocatus   95
hasta meos, nunc tempus adest; te maximus Actor,
te Turni nunc dextra gerit; da *sternere* corpus
loricamque manu valida lacerare revolsam
semiviri Phrygis et foedare in pulvere crinis
vibratos calido ferro murraque madentis.   100
His agitur furiis totoque ardentis ob ore
scintillae absistunt, *oculis* micat acribus ignis
mugitus veluti cum prima in proelia temptat,
terrificos ciet atque irasci in cornua temptat,
arboris obnixus trunco, ventosque lacessit   105
ictibus aut sparsa ad pugnam proludit *arena.*

2. Scan vv. 83-87, marking and naming in each the chief caesura.

3. Explain the grammatical construction of the italicized words.

1. Translate Horace, *Epistt.*, 2, 3, 73-98. Metre and matter.

Res gestae regumque ducumque et tristia bella
quo scribi *possent* numero monstravit Homerus,
versibus impariter iunctis querimonia primum,   75
post etiam inclusa est *voti* sententia compos.
quis tamen exiguos elegos emiserit auctor,
grammatici certant et adhuc sub indice lis est.
Archilochum proprio rabies armavit iambo;
hunc socci cepere pedem grandesque cothurni   80
alternis aptum *sermonibus* et populares
vincentem strepitus et natum rebus agendis.
Musa dedit fidibus divos puerosque deorum
et pugilem victorem et equum certamine primum
et iuvenum curas et libera vina *referre.*   85
descriptas servare vices operumque colores
cur ego si nequeo ignoroque *poeta* salutor?
cur nescire pudens prave quam discere malo?
versibus exponi tragicis res comica non volt.
indignatur item privatis ac prope *socco*   90
dignis carminibus narrari cena Thyestae.
singula quaeque locum *teneant* sortita decentem.
interdum tamen et vocem comoedia tollit
iratusque Chremes tumido delitigat *ore;*
et tragicus plerumque dolet sermone pedestri   95
Telephus et Peleus, cum pauper et exsul uterque
proicit ampullas et sesquipedalia verba,
si curat cor spectantis tetigisse querella.

2. Scan vv. 73-77, marking and naming in each the chief caesura.

3. Explain the grammatical construction of the italicized words.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

HISTORY. (*Counted as one section.*)

SEPTEMBER, 1896.—TWO HOURS.

GREEK HISTORY.

1. When and under what circumstances did Peisistratus rise to power? What was the character of his government?

2. When did the first invasion of Greece by the Persians take place; and why was it made? What part did Sparta take in the Persian wars?

3. When and why did Athens undertake the expedition to Sicily? Discuss the share taken by Alcibiades in the movement. Who were Demosthenes, Gylippus?

4. Explain the forms of government established in Athens after her fall in 404 B.C.—*i.e.*, the government of the harmost, of the Thirty Tyrants. What form of government followed the overthrow of the Tyrants?

5. Give the causes of the Social War; of the Sacred War; and discuss the relation of Philip of Macedon to the latter event.

ROMAN HISTORY.

1. Explain the reorganization of the Roman constitution by Servius Tullius. Show how it differed from the original constitution.

2. Trace the career of Hannibal until his victory at Cannæ. After so many successes why did he fail to conquer Rome?

3. What were the chief defects in the political organization and what the social evils of Rome in the time of the Gracchi? How did Gaius Gracchus try to remedy these?

4. When did the conquest of Gaul take place? What was its importance (1) for the people of Gaul; (2) for the Romans; (3) for Julius Cæsar?

5. Compare the character and work of Tiberius, Vespasian, Titus, and Hadrian. What did each do for Rome?

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

HISTORY. (*Counted as one section.*)

SEPTEMBER, 1896.—TWO HOURS.

ENGLISH HISTORY.

1. How were the Anglo-Saxons governed? Explain the position and work of the ealdorman, the witenagemot. Define fyrd, folkland.

2. For what is Edward I. especially famous? What was his attitude toward the baronage? the church? In this connection explain the Statute of Mortmain.

3. When did the Long Parliament open? What did it accomplish during the first year of its sitting? When did the great Civil War begin and how long did it last? Explain Pride's Purge.

4. When did England gain her first foothold in India? Explain the East India Company, the work of Clive and of Warren Hastings, and the Sepoy rebellion.

5. Why did England take part in the Crimean War? Did she gain anything from the war?

AMERICAN HISTORY.

1. What is meant by a royal colony? Which of the colonies were royal during their entire history? Were Maryland, New Hampshire, New Jersey, North Carolina, South Carolina, Pennsylvania, royal or proprietary colonies?

2. Give the boundaries of the United States as defined by the peace of 1783. What was the Northwest Ordinance, to what territory (that is, territory of what present states) did it apply, and what form of government did it establish?

3. Under what circumstances was Texas admitted to the Union? What had been the earlier history of the territory? What was the importance of the admission for the slavery question?

4. Which were the first states to secede from the Union; which the second? Why did not all the Confederate states secede at once? Say what you can of the form of government established by the Confederacy.

5. Discuss the character of President Andrew Johnson and the causes of the quarrel with Congress that led to his impeachment.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

ENGLISH. *(Counted as one section.)*

September, 1896.—One and a Half Hours.

I. Grammar and Punctuation.

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

1. Like Jane Eyre, Lucy Snowe's early life is passed in much trouble and she finally becomes a teacher. Like *Jane Eyre* too, the story of *Villete* is written in the form of an autobiography.

2. Believing that it was a law of the Universe that whatever was, was right, it is hardly surprising that he made no attempt to avert the catastrophe, which his friends thought most foolish on his part.

3. We will see that Jane Austen was not fairly treated by her contemporaries, if we judge her work by the standards of her own time, and we would certainly be unfair in requiring them to judge her by those they were not yet acquainted with.

4. I have no doubt but that I would get an increase of wages if I was to go to Chicago, but it seems to me that it is a great undertaking to go among strangers, and I am afraid I will never have the courage to do it.

5. Neither Horace or Vergil display any love of nature in her wilder aspects. They delight not only in "the habitable parts of the earth," like Ruskin does, but like he does, they also like these "habitable parts" to be trim and tidy.

6. Everyone who has read Mr. B.'s book on *Money* declares that they have never read a clearer exposition of this subject, that is undoubtedly as abstract if not more than any which engages the attention of political economists.

7. The chief thing to remember concerning the statements and definitions of these gentlemen is that they are based neither upon any definite ideas or principles regarding the science of exchange, but merely from the standpoint of private interests alone.

8. The Carpenters' Company, which owns the hall, are the friends of liberty, who have offered their hall to the delegates, and the place seems fit.

9. We would contradict all we shall and have said to you, if we pretend that we can reform the world by a system.

10. " The Coming of Theodora " is a story which is sure to promote discussion, for it is by no means one of the novels which makes no statements, hazards no opinions, except such as all approve without question, and the most fastidious novel reader is sure to admire it, for the characters are true to life, the incidents are natural, as well as the interest being well sustained, though it deals with but few persons in a half-rural neighborhood.

11. I fully intended to have written you a full account of my experiences in Denver, but the terrible panic of the summer, consequent upon the sudden fall in silver in May, absorbed my attention, and it is only now, late in the Fall, that I have found time for anything outside my business, even to write to my best friends.

Punctuate (on the printed text) the following passages:

The honest fellow had long been in the custom of sending himself to sleep with tales and so had his father before him but these were irresponsible inventions told for the tellers pleasure with no eye to the crass public or the thwart reviewer tales where a thread might be dropped or one adventure quitted for another on fancys least suggestion * * * But presently my dreamer began to turn his former amusement of story telling to what is called account by which I mean that he began to write and sell his tales * * * All other forms of dream deserted him but two he still occasionally reads the most delightful book he still visits at times the most delightful places * * * But all the rest of the family of visions is quite lost to him the common mangled version of yesterdays affairs the raw-head-and-bloody-bones nightmare rumored to be the child of toasted cheese these and their like are gone

STEVENSON *A Chapter on Dreams*

The following is a fair example of one of Christina Rossetti's favorite forms of verse

> The half was not told me said Shebas Queen
> Weighing that wealth of wisdom and of gold
> Thy fame falls short of this that I have seen
> The half was not told
>
> Happy thy servants who stand to behold
> Stand to drink in thy gracious speech and mien
> Happy thrice happy the flock of thy fold
>
> As the darkened moon while a shadow between
> Her face and her kindling sun is rolled
> I depart but my heart keeps memory green
> The half was not told

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

ENGLISH. (*Counted as one section.*)

II. COMPOSITION.

SEPTEMBER, 1896.—TWO HOURS.

(*a.*) Compare *Lycidas* and *Adonais*, pointing out, for instance, the general resemblances and also any differences that may strike you in subject, structure, language, method of treatment, spirit, etc.

(*b.*) What elements in the way of fairy-tale and classical tradition are common to Shakespeare's *Midsummer Night's Dream* and Milton's *L'Allegro, Il Penseroso*, and *Comus*, and what differences are there in the way this common material is used by the two poets?

Take either (*a*) or (*b*).

The composition must contain at least sixty lines of foolscap, and must be correct in spelling, grammar, punctuation, paragraphing, and general arrangement.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

SCIENCE.   (*Counted as one section.*)

SEPTEMBER, 1896.—TWO HOURS.

BOTANY.

1. What is a cell?   What is meant by the term " cellular " as applied to plants?   What is an intercellular space?

2. Why does a plant flourish better in the open air than in a house?

3. Explain why vegetation is less luxuriant in a dry than in a rainy season.

4. What is a *carpel ?*   A *phyllome ?*   A *petiole ?*   A *peduncle ?*   A *connective ?*   *Pollination ?*

5. From what does the green color of leaves arise? Why are flowers generally of some other color?

6. In what way does the fruit of the apple-tree develop from the blossom?   How does the pea-pod arise from the blossom?   The strawberry?

7. What external conditions are necessary for the germination of the seed and for the unfolding of the leaf-buds?

8. Tell what you know of the means for the protection and dispersal of seeds.

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EXAMINATION FOR MATRICULATION.

SCIENCE. (*Counted as one section.*)

SEPTEMBER, 1896.—TWO HOURS.

PHYSIOLOGY.

1. Structure and action of the heart. (N. B.—Do not describe the blood.)

2. Organs of the thoracic cavity.

3. What do you understand to be the " central nervous system " and what does it do?

4. Why is it better to breathe through the nose than through the mouth? Do you know why people snore?

5. Briefly define the following structures, indicating what seems to you the chief function of each:
Pancreas, Ureter, Gall Bladder, Cochlea, Peritoneum, Patella, Iris, Œsophagus, Kidney, Retina.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

SCIENCE. (*Counted as one section.*)

SEPTEMBER, 1896.—TWO HOURS.

PHYSICAL GEOGRAPHY.

1. Explain with diagram the change of seasons and suppose conditions which would give (in Northern Hemisphere) longer, colder winters and shorter summers than the present.

2. Discuss the composition and function of the atmosphere.

3. Explain color of the atmosphere and the rainbow.

4. Give causes for movements of the atmosphere. Explain the formation of dew.

5. What is climate and how is it affected by the ocean?

6. Classify oceanic islands and explain formation.

7. Discuss the deposits of the sea.

8. How do earthquake waves differ from light waves and how is the focus of the earthquake movement determined?

9. What are the products of volcanic action?

10. Classify and describe briefly the rocks of the earth's crust.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

SCIENCE. (*Counted as one section.*)

SEPTEMBER, 1896.—TWO HOURS.

PHYSICS.

1. How can you combine two velocities in different directions into a resultant velocity? Generalize your conclusion for any number of velocities.

A train is going north-east at the rate of forty miles an hour: what are its northerly and easterly velocities?

2. Tell what is meant by saying that "pressure in a fluid is transmitted equally in all directions." Hence describe and explain the action of the Bramah Press.

3. What is latent heat of change of state? What is a freezing mixture? Explain each of these by the transformations of the energy.

Ten grammes of steam at 100° C. condensed in one kilogramme of water at 0° C. raised the temperature of the water to 6°.3 C. Calculate the latent heat of steam.

4. Define and explain potential, dielectric, condenser. How is it shown that electrification is a phenomena of the dielectric rather than of the plates of a condenser?

4. Define magnetic lines of force. How can you approximately find them in the case of a horse-shoe magnet?

6. Compare light and sound as vibrations, discussing difference in medium, kind of vibration, period, etc. Can sound waves be reflected and refracted? Give examples to illustrate your answer.

7. What is colour? What are complementary colours? Explain the action of a color-wheel in mixing colours.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

SCIENCE. (*Counted as one section.*)

SEPTEMBER, 1896.—TWO HOURS.

CHEMISTRY.

1. Give two methods for preparing hydrogen. What are the physical and chemical properties of hydrogen?

2. What is formed when the following substances burn: hydrogen, carbon monoxide, carbon, sulphur? Write the equations representing these reactions.

3. How is iodine obtained from compounds containing it? In what respects do chlorine, bromine and iodine resemble each other and how do they differ from each other? How could you determine whether any substance contained iodine or not?

4. Define the terms: acid, base, salt; and illustrate by equations the reactions between (*a*) an acid and a metal, (*b*) an acid and a base, (*c*) an acid and a salt, (*d*) a salt and a salt.

5. What is a flame, and what is the difference between a luminous and a non-luminous flame?

6. From what substance is free phosphorus obtained and how is it prepared? What are the two modifications of phosphorus? How do they differ in chemical and physical properties and why are they regarded as different modifications of the same element?

7. How can you convert free sulphur into sulphuric acid? Give equations.

8. What is the most important calcium compound that occurs in nature? How could you prepare the following calcium compounds: calcium oxide, calcium hydroxide, calcium chloride, calcium sulphate; and what are the formulas of these compounds?

9. Complete the following equations:

$$H_2S + SO_2 =$$
$$H_2O_2 + KI + H Cl =$$
$$MnO_2 + H Cl =$$
$$BaCl_2 + K_2SO_4 =$$
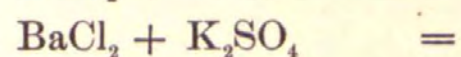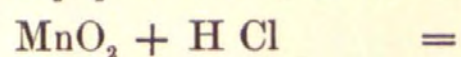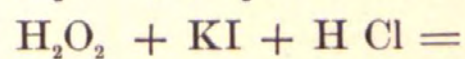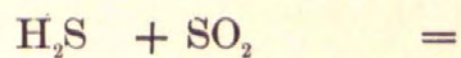
10. How many grams of carbon dioxide would be obtained by burning 12 grams of carbon?

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

GREEK. (*Counted as three sections.*)

First Section : Grammar and Composition.

September, 1896.

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

1. In the prose extract, inflect in its voice and tense:
ἐξέπλει, συνέχειτο. Decline ναῦς, τριήρεις. Give the principal
parts of προσλαβών, ἀποβάς, ἔχων, ἡγουμένου, ἔτυχον. Explain
the optatives in ὅσοι ἐλεύθεροι εἶεν, τά τ᾽ ἐπιτήδεια θαυμάσαιτε,
the subjunctives in ἐὰν μέντοι θεὸς ἐθέλῃ, ὅταν ὑμῶν ἄρχω.

II. Translate into Greek :

When they heard this, the ambassadors made a report to
their several cities. And all the others said they would do
what their generals had promised, but the Thebans alone
refused to accept the truce. Accordingly the war broke out
again and continued for two years and six months, until at
last the citizens of both sides were ready to put an end to the
conflict. During this period many men lost their lives and
much property was destroyed.

III. Scan the last three lines from the extract from Homer.
Give the Attic for the Homeric forms in the first ten lines.

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EXAMINATION FOR MATRICULATION.

GREEK. (*Counted as three sections.*)

SECOND SECTION: PROSE AUTHORS.

SEPTEMBER, 1896.

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

I. Translate:

ἐνταῦθα Ξενοφῶν ὁρᾷ τοῦ ὄρους τὴν κορυφὴν ὑπὲρ αὐτοῦ τοῦ
ἑαυτῶν στρατεύματος οὖσαν, καὶ ἀπὸ ταύτης ἔφοδον ἐπὶ τὸν λόφον
ἔνθα ἦσαν οἱ πολέμιοι, καὶ λέγει, Κράτιστον, ὦ Χειρίσοφε, ἡμῖν
ἵεσθαι ὡς τάχιστα ἐπὶ τὸ ἄκρον· ἢν γὰρ τοῦτο λάβωμεν, οὐ δυνήσονται
μένειν οἱ ὑπὲρ τῆς ὁδοῦ. ἀλλά, εἰ βούλει, μένε ἐπὶ τῷ στρατεύματι,
ἐγὼ δ’ ἐθέλω πορεύεσθαι· εἰ δὲ χρῄζεις, πορεύου ἐπὶ τὸ ὄρος, ἐγὼ
δὲ μενῶ αὐτοῦ. Ἀλλὰ δίδωμί σοι, ἔφη ὁ Χειρίσοφος, ὁπότερον
βούλει ἑλέσθαι. εἰπὼν ὁ Ξενοφῶν ὅτι νεώτερός ἐστιν αἱρεῖται
πορεύεσθαι, κελεύει δέ οἱ συμπέμψαι ἀπὸ τοῦ στόματος ἄνδρας·
μακρὸν γὰρ ἦν ἀπὸ τῆς οὐρᾶς λαβεῖν. καὶ ὁ Χειρίσοφος συμπέμπει
τοὺς ἀπὸ τοῦ στόματος πελταστάς, ἔλαβε δὲ τοὺς κατὰ μέσον τοῦ
πλαισίου. συνέπεσθαι δ’ ἐκέλευσεν αὐτῷ καὶ τοὺς τριακοσίους οὓς
αὐτὸς εἶχε τῶν ἐπιλέκτων ἐπὶ τῷ στόματι τοῦ πλαισίου. ἐντεῦθεν
ἐπορεύοντο ὡς ἐδύναντο τάχιστα. οἱ δ’ ἐπὶ τοῦ λόφου πολέμιοι ὡς
ἐνόησαν αὐτῶν τὴν πορείαν ἐπὶ τὸ ἄκρον, εὐθὺς καὶ αὐτοὶ ὥρμησαν
ἁμιλλᾶσθαι ἐπὶ τὸ ἄκρον. καὶ ἐνταῦθα πολλὴ μὲν κραυγὴ ἦν τοῦ
Ἑλληνικοῦ στρατεύματος διακελευομένων τοῖς ἑαυτῶν, πολλὴ δὲ
κραυγὴ τῶν ἀμφὶ Τισσαφέρνην τοῖς ἑαυτῶν διακελευομένων. Ξενοφῶν
δὲ παρελαύνων ἐπὶ τοῦ ἵππου παρεκελεύετο, Ἄνδρες, νῦν ἐπὶ τὴν
Ἑλλάδα νομίζετε ἁμιλλᾶσθαι, νῦν πρὸς τοὺς παῖδας καὶ τὰς
γυναῖκας, νῦν ὀλίγον πονήσαντες ἀμαχεὶ τὴν λοιπὴν πορευσόμεθα.

II. Translate:

συνείποντο δὲ καὶ οἱ σύμμαχοι πάντες πλὴν Βοιωτῶν καὶ Κοριν-
θίων · οὗτοι δὲ ἔλεγον μὲν ὅτι οὐ νομίζοιεν εὐορκεῖν ἂν στρατευόμενοι
ἐπ' Ἀθηναίους μηδὲν παράσπονδον ποιοῦντας · ἔπραττον δὲ ταῦτα,
ὅτι ἐγίγνωσκον Λακεδαιμονίους βουλομένους τὴν τῶν Ἀθηναίων
χώραν οἰκείαν καὶ πιστὴν ποιήσασθαι. ὁ δὲ Παυσανίας ἐστρα-
τοπεδεύσατο μὲν ἐν τῷ Ἁλιπέδῳ καλουμένῳ πρὸς τῷ Πειραιεῖ δεξιὸν
ἔχων κέρας, Λύσανδρος δὲ σὺν τοῖς μισθοφόροις τὸ εὐώνυμον
Ἐλευσῖνι. πέμπων δὲ πρέσβεις ὁ Παυσανίας πρὸς τοὺς ἐν
Πειραιεῖ ἐκέλευεν ἀπιέναι ἐπὶ τὰ ἑαυτῶν · ἐπεὶ δ' οὐκ ἐπείθοντο,
προσέβαλλεν ὅσον ἀπὸ βοῆς ἕνεκεν, ὅπως μὴ δῆλος εἴη εὐμενὴς αὐτοῖς
ὤν.

III. Translate:

Ξενοφῶν δὲ ἔχων τῶν ὀπισθοφυλάκων τοὺς ἡμίσεις ἐπορεύετο
ᾗπερ οἱ τὸν ἡγεμόνα ἔχοντες · εὐοδωτάτη γὰρ ἦν τοῖς ὑποζυγίοις ·
τοὺς δὲ ἡμίσεις ὄπισθεν τῶν ὑποζυγίων ἔταξε. πορευόμενοι δ'
ἐντυγχάνουσι λόφῳ ὑπὲρ τῆς ὁδοῦ κατειλημμένῳ ὑπὸ τῶν πολεμίων,
οὓς ἢ ἀποκόψαι ἦν ἀνάγκη ἢ διεζεῦχθαι ἀπὸ τῶν ἄλλων Ἑλλήνων.
καὶ αὐτοὶ μὲν ἂν ἐπορεύθησαν ᾗπερ οἱ ἄλλοι, τὰ δὲ ὑποζύγια οὐκ ἦν
ἄλλῃ ἢ ταύτῃ ἐκβῆναι. ἔνθα δὴ παρακελευσάμενοι ἀλλήλοις
προσβάλλουσι πρὸς τὸν λόφον ὀρθίοις τοῖς λόχοις, οὐ κύκλῳ ἀλλὰ
καταλιπόντες ἄφοδον τοῖς πολεμίοις, εἰ βούλοιντο φεύγειν. καὶ τέως
μὲν αὐτοὺς ἀναβαίνοντας ὅπῃ ἐδύνατο ἕκαστος οἱ βάρβαροι ἐτόξευον
καὶ ἔβαλλον, ἐγγὺς δ' οὐ προσίεντο, ἀλλὰ φυγῇ λείπουσι τὸ χωρίον.
καὶ τοῦτόν τε παρεληλύθεσαν οἱ Ἕλληνες καὶ ἕτερον ὁρῶσιν ἔμπρο-
σθεν λόφον κατεχόμενον ἐπὶ τοῦτον αὖθις ἐδόκει πορεύεσθαι.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

GREEK. (*Counted as three sections.*)

THIRD SECTION: HOMER.

SEPTEMBER, 1896.

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

Translate :

> ἔνθ' αὖ Τυδείδῃ Διομήδεϊ Παλλὰς Ἀθήνη
> δῶκε μένος καὶ θάρσος, ἵν' ἔκδηλος μετὰ πᾶσιν
> Ἀργείοισι γένοιτο ἰδὲ κλέος ἐσθλὸν ἄροιτο.
> δαῖέ οἱ ἐκ κόρυθός τε καὶ ἀσπίδος ἀκάματον πῦρ,
> ἀστέρ' ὀπωρινῷ ἐναλίγκιον, ὅς τε μάλιστα   5
> λαμπρὸν παμφαίνῃσι λελουμένος Ὠκεανοῖο ·
> τοῖόν οἱ πῦρ δαῖεν ἀπὸ κρατός τε καὶ ὤμων,
> ὦρσε δέ μιν κατὰ μέσσον, ὅθι πλεῖστοι κλονέοντο.
>
> ἦν δέ τις ἐν Τρώεσσι Δάρης ἀφνειὸς ἀμύμων,
> ἱρεὺς Ἡφαίστοιο · δύω δέ οἱ υἱέες ἤστην,   10
> Φηγεὺς Ἰδαῖός τε, μάχης ἐῢ εἰδότε πάσης ·
> τώ οἱ ἀποκρινθέντε ἐναντίω ὁρμηθήτην ·
> τὼ μὲν ἀφ' ἵπποιιν, ὁ δ' ἀπὸ χθονὸς ὤρνυτο πεζός.
> οἱ δ' ὅτε δὴ σχεδὸν ἦσαν ἐπ' ἀλλήλοισιν ἰόντες,
> Φηγεύς ῥα πρότερος προΐει δολιχόσκιον ἔγχος ·   15
> Τυδείδεω δ' ὑπὲρ ὦμον ἀριστερὸν ἤλυθ' ἀκωκὴ
> ἔγχεος, οὐδ' ἔβαλ' αὐτόν. ὁ δ' ὕστερος ὤρνυτο χαλκῷ
> Τυδείδης · τοῦ δ' οὐχ ἅλιον βέλος ἔκφυγε χειρός,
> ἀλλ' ἔβαλε στῆθος μεταμάζιον, ὦσε δ' ἀφ' ἵππων.
> Ἰδαῖος δ' ἀπόρουσε λιπὼν περικαλλέα δίφρον,   20

οὐδ' ἔτλη περιβῆναι ἀδελφειοῦ κταμένοιο.
οὐδὲ γὰρ οὐδέ κεν αὐτὸς ὑπέκφυγε κῆρα μέλαιναν,
ἀλλ' Ἥφαιστος ἔσυτο, σάωσε δὲ νυκτὶ καλύψας,
ὡς δή οἱ μὴ πάγχυ γέρων ἀκαχήμενος εἴη.
ἵππους δ' ἐξελάσας μεγαθύμου Τυδέος υἱὸς   25
δῶκεν ἑταίροισιν κατάγειν κοίλας ἐπὶ νῆας.
Τρῶες δὲ μεγάθυμοι ἐπεὶ ἴδον υἷε Δάρητος
τὸν μὲν ἀλευάμενον, τὸν δὲ κτάμενον παρ' ὄχεσφιν,
πᾶσιν ὀρίνθη θυμός· ἀτὰρ γλαυκῶπις Ἀθήνη
χειρὸς ἑλοῦσ' ἐπέεσσι προσηύδα θοῦρον Ἄρεα·   30
" Ἄρες, Ἄρες βροτολοιγέ, μιαιφόνε, τειχεσιπλῆτα,
οὐκ ἂν δὴ Τρῶας μὲν ἐάσαιμεν καὶ Ἀχαιοὺς
μάρνασθ', ὁπποτέροισι πατὴρ Ζεὺς κῦδος ὀρέξῃ;
νῶι δὲ χαζώμεσθα, Διὸς δ' ἀλεώμεθα μῆνιν."

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

FRENCH. (*Counted as three sections.*)

SEPTEMBER, 1896.—THREE HOURS.

I. GRAMMAR.

1. Give the plural forms of mal, végétal, régal, soupirail, détail, manteau, fardeau, bois, poix, cheveu, lieu, and the feminine forms of poltron, rond, rieur, extérieur, tentateur, fatal, nasal, plein, moyen, discret, net, altier, bas, rompu, pareil, fidèle, sot, mou, envieux, nouveau, grec, sec.

2. Give the following French sentence: *Je lui donne un livre.*

> (1) A plural form.
> (2) A negative form.
> (3) An interrogative form.
> (4) A subjunctive form.
> (5) A perfect or past indefinite form, (1) affirmative, (2) negative and (3) interrogative.

3. Give (1) the present indicative of placer, appeler, harceler, ressentir, ceindre, devoir, paître, cuire, abstraire.

> (2) The future of ôter, dissoudre, acquérir, percevoir, envoyer, devenir, falloir, astreindre, entrevoir.

> (3) The preterite of envoyer, savoir, devenir, moudre, coudre.

> (4) The present subjunctive of prendre, faire, devoir, dire, défendre, assaillir, maintenir, assouvir, courir, résoudre.

II. TRANSLATION.

Aux murs, le papier montrait des bouquets dénoués, des blés, des bluets, des coquelicots. Au plafond, un ciel était peint, léger, matinal, plein de vapeurs. Entre la porte et la fenêtre, un prie-Dieu en bois sculpté, avec un coussin en tapisserie, avait comme une place amie, familière et discrète dans un coin; au-dessus, brillait un bénitier en cuivre qui représentait le baptême de Jésus par Saint-Jean. A l'angle opposé, une petite étagère suspendue au mur avec des cordons de soie, laissant voir des dos de livres penchés l'un sur l'autre, et des cartonnages en toile d'ouvrages anglais. Devant la fenêtre encadrée de plantes grimpantes qui se rejoignaient en haut et trempaient dans la lumière le bord de leurs feuilles, un miroir garni de velours bleu posait sur une toilette à dessous de soie recouvert d'une guipure, au milieu de flacons à bouchons d'argent.

Il n'importe pas seulement de bien saisir un talent au moment du coup d'essai et du premier éclat, quand il apparaît tout formé et plus qu'adolescent, quand il se fait adulte; il est un second temps non moins décisif à noter, si l'on veut l'embrasser dans son ensemble: c'est le moment où il se gâte, où il se corrompt, où il déchoit, où il dévie. Prenez les mots les moins choquants, les plus doux que vous voudrez, la chose arrive à presque tous. Je supprime les exemples; mais il est, dans la plupart des vies littéraires qui nous sont soumises, un tel moment où la maturité qu'on espérait est manquée, ou bien, si elle est atteinte, est dépassée, et où l'excès même de la qualité devient le défaut; où les uns se roidissent et se dessèchent, les autres se lâchent et s'abandonnent, les autres s'endurcissent,

s'alourdissent, quelques-uns s'aigrissent; où le sourire devient une ride. Après le premier moment où le talent dans sa floraison brillante s'est fait homme et jeune homme éclatant et superbe, il faut bien marquer ce second et triste moment où il se déforme et se fait autre en vieillissant.

Si l'on présentait le tableau d'un état qui sort d'une grande crise, et qu'on dît: Il y avait dans cet état un gouvernement absolu dont l'autorité a été restreinte; deux classes privilégiées qui ont perdu leur suprématie; un peuple immense déjà affranchi par l'effet de la civilisation et des lumières, mais sans droits politiques, et qui a été obligé à cause des refus essuyès, de les conquérir lui-même; si l'on ajoutait: Le gouvernement, après s'être opposé à cette révolution, s'y est soumis, mais les classes privilégiées l'ont constamment combattue, voici ce que l'on pourrait conclure de ces données. Le gouvernement aura des regrets, le peuple montrera de la défiance, et les classes privilégiées attaqueront l'ordre nouveau chacune à sa manière.

Un jour deux pèlerins sur le sable recontrent
Un huître que le flot y venait d'apporter:
Ils l'avalent des yeux, du doigt ils se la montrent;
A l'égard de la dent il fallut contester.
L'un se baissait déjà pour amasser la proie;
L'autre le pousse et dit: il est bon de savoir
   Qui de nous en aura la joie.
Celui qui le premier a pu l'apercevoir
En sera le gobeur; l'autre le verra faire.
   Si par là l'on juge l'affaire,
Reprit son compagnon, j'ai l'œil bon, Dieu merci.
   Je ne l'ai pas mauvais aussi.
Dit l'autre: et je l'ai vue avant vous, sur ma vie.
Hé bien! vous l'avez vue, et moi je l'ai sentie.
   Pendent tout ce bel incident,
Perrin Dandin arrive: ils le prennent pour juge.
Perrin fort gravement, ouvre l'huître et la gruge,
   Nos deux Messieurs le regardant.
Ce repas fait il dit d'un ton de président:
Tenez, la cour vous donne à chacun une écaille
Sans dépens; et qu'en paix chacun chez soi s'en aille.

BRYN MAWR COLLEGE.

EXAMINATION FOR MATRICULATION.

GERMAN. (*Counted as three sections.*)

SEPTEMBER, 1896—THREE HOURS.

I. GRAMMAR.

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

Bahn (f.)	Luft (f.)	Prinzessin (f.)
Gesetz (n.)	Nachbar (m.)	Strauch (m.)
Hund (m.)	Ohr (n.)	Vogel (m.)
Kahn (m.)	Prinz (m.)	Volk (n.)

2. Decline " der hohe Turm " and " ein hoher Turm."

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:

benennen	liegen	verletzen
erraten	ringen	vorstellen
geniessen	schneiden	zerbrechen
helfen	übervorteilen	zurücklegen

II. TRANSLATION.

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

1.

Liebes Kind, sagte der Graf endlich, nachdem er sich etwas besonnen hatte, et thut mir leid, deinen Schlaf gestört zu haben. Aber da es doch einmal geschehen ist,

wäre es mir lieb, wenn du mich durch die übrigen Räume führen wolltest. Ich hätte nicht übel Lust, falls der Besitzer es hergeben wollte, das alte Schloss zu kaufen.

Sie sah noch immer von ihm weg und erwiederte nur: Der Vater kommt erst morgen. Sie können dan mit ihm sprechen. Er hat den Schlüssel zum oberen Stock; da ist aber nichts als die nackten Mauren.

Gehört das Schloss dem Vater?

Nein Herr. Er hat nur die Aufsicht.

Und wie lange wohnt ihr schon hier?

Wie lange?—und sie sah auf und wie nachsinnend in die dunkle Vorhalle hinaus. Ich weiss nicht. Vielleicht drei Jahr.

Und wo wart ihr früher?

Ich darf's nicht sagen; der Vater hat es verboten!—und eine dunkle Röte schoss ihr in die Wangen. Jetzt erst sagte er sich, dass ihr Gesicht vollkommen schön sei, selbst in dieser Verwilderung.

Schon drei Jahr ! wiederholte er bedauernd. Und wie alt bist du denn, liebes Kind?

Zwanzig, Herr; oder mehr.

Er hätte ihr kaum sechzehn gegeben, so schüchtern war noch der Wuchs in allen Umrissen, so kindlich herbe die Wange und der blasse Mund. Sag mir auch, wie du heissest, bat er sie.

Filomena, erwiederte sie leise.—Dann entstand eine Pause, in der ihr plötzlich eine dunkle Angst aufzusteigen schien. Sie lief hastig in den Verschlag, wo das Bette stand, und fasste die Alte am Arm. Grossmutter, rief sie ihr mit heller Stimme ins Ohr, wacht auf, es ist Jemand da, der das Schloss sehen will.

(*P. Heyse.*)

II.

Die wenigen Holzhauer rennen in Verwirrung herum und fluchen und rufen nach Hilfe. Aber der Wald und seine Hütten sind menschenleer, alles ist bei der Prozession. Bis sie nach Stunden endlich kommen, ist der Hochwald im Brande. Das ist ein Fiebern und Zittern in

der Luft, ein Krachen und Prasseln weithin; Aeste stürzen nieder, Stämme brechen zusammen und sprühen noch einmal auf in den wogenden Rauch. Neu und frisch blasen glühende Luftströme durch das Gehölz; die Flammen erzeugen sich selbst den Sturm, auf dem sie fahren. O gewaltiges, nimmersattes Element! Es zehrt, so lange es lebt, und lebt, so lange es zehrt, es verzehrt die Welt, und wenn sie erreichbar, tausend Welten, und hat nimmer genug. Keine Macht kann so in's Unendliche wachsen als das Feuer, darum stellt es der Seher als den letzten Sieger über alles dar, als den Herrscher der Ewigkeit.

(*Rosegger*.)

III.

Den Staat bedachtsam zwischen den Klippen hindurchzusteuern, bis der rechte Augenblick der Erhebung erschien, war diesem Helden des heiligen Zornes und der stürmischen Wahrhaftikeit nicht gegeben. Doch niemand war wie er für die Aufgaben des politischen Reformators geboren. Der zerrütteten Monarchie wieder die Richtung auf hohe sittliche Ziele zu geben, ihre schlummernden herrlichen Kräfte durch den Weckruf eines feurigen Willens zu beleben—das vermochte nur *Stein*, denn keiner besass wie er die fortreissende, überwältigende Macht der grossen Persönlichkeit. Jedes unedle Wort verstummte, keine Beschönigung der Schwäche und der Selbstsucht wagte sich mehr heraus, wenn er seine schwerwiegenden Gedanken in markigem, altväterischem Deutsch aussprach, ganz kunstlos, volkstümlich derb, in jener wuchtigen Kürze, die dem Gedankenreichtum, der verhaltenen Leidenschaft des echten Germanen natürlich ist.

(*v. Treitschke*.)

IV. Nach dem Gewitter.

Erst eben Donnergerolle
In flammender Wolkenschlacht,
Und nun die zaubervolle
Selige Stille der Nacht!

Es flohen die Ruhestörer
Des Tages vor ihr hin,
Wie die besiegten Empörer
Vor ihrer Königin.

Hell schwimmt im Wasserspiegel
Der ganze Himmelsdom—
Es drückt sein **Sternensiegel**
Der Himmel auf den Strom.

Nur matt am Himmelssaume
Leuchtet's noch ab und zu,
Wie sich der Geist im **Traume**
Noch regt in Schlafesruh.

(*Bodenstedt.*)

BRYN MAWR COLLEGE.

EXAMINATION FOR ADVANCED STANDING

SOLID GEOMETRY.

SEPTEMBER, 1896.—TWO HOURS.

[N.B.—When this paper is taken with Trigonometry, the time allowed is one and a half hours. Questions 1 and 2 are then to be omitted, and the reason for this omission is to be stated.]

1. Prove that the complete intersection of two planes is a straight line. Discuss the intersection of *three* planes in all the possible arrangements.

Into how many portions is space divided by three planes? By four planes?

2. Prove that if two straight lines are cut by three parallel planes, they are cut proportionally. Illustrate by two diagrams, one for the case of non-intersecting lines, the second for the case of intersecting lines.

3. Prove that to two non-intersecting straight lines one common perpendicular can be drawn, and that this will be the shortest line joining the given lines.

4. Define a pyramid, and prove that parallel sections are similar polygons, whose areas are proportional to the squares of their distances from the vertex.

A pyramid is cut into two parts by a plane parallel to the base; the volume of the lower part is seven times the volume of the upper part. Find the area of the section by the cutting plane, it being given that the area of the base is four square feet.

5. Explain the process by which properties of the right circular cylinder are deduced from properties of a prism. Determine the lateral surface and volume of a cylinder.

6. Define a sphere. Prove that through four points not in the same plane one sphere and only one can be described.

7. State and prove the relation of the volumes of a hemisphere, the circumscribing cylinder, and the inscribed cone.

8. Explain what is meant by polar triangles on a sphere. State and prove the relation between the parts of a pair of polar triangles.

BRYN MAWR COLLEGE.

EXAMINATION FOR ADVANCED STANDING.

TRIGONOMETRY.

SEPTEMBER, 1896.—TWO HOURS.

(*N.B.—When this paper is taken with Solid Geometry, the time allowed is one hour and a half; questions 1 and 3 are then to be omitted.*)

1. Express all the trigonometrical ratios in terms of the tangent. Given $\operatorname{Sin} \theta = \dfrac{5}{6}$, find $\operatorname{Cos} \theta$ and $\operatorname{Cot} \theta$.

2. The shadow of a tower standing on a level plane is $30\sqrt{3}$ feet longer when the sun's altitude is $30°$ than when it is $60°$. Find the height of the tower.

3. What is meant in Trigonometry by a negative line, a negative angle, and the trigonometrical ratios of an angle of any magnitude? Write down the values of $\operatorname{Sin} -45°$, $\operatorname{Cos} 240°$, $\operatorname{Tan} 315°$.

4. Prove that
$$\frac{\operatorname{Sin} A - \operatorname{Sin} 3A}{\operatorname{Cos} 3A - \operatorname{Cos} A} = \operatorname{Cot} 2A.$$

Simplify
$$\operatorname{Sin}(A + B) \operatorname{Cos}(A - B) + \operatorname{Cos}(A + B) \operatorname{Sin}(A - B).$$

5. Prove that
$$\operatorname{Tan} 3A = \frac{3 \operatorname{Tan} A - \operatorname{Tan}^3 A}{1 - 3 \operatorname{Tan}^2 A}.$$

6. Prove that

(i.) $\log_a \dfrac{m}{n} = \log_a m - \log_a n$

(ii.) $\log_a m = \log_b m \times \log_a b.$

Find the value of $\log_4 128$.

7. The sides of a triangle are 47.3 feet, 32.1 feet, and 30 feet; calculate the area of the triangle.