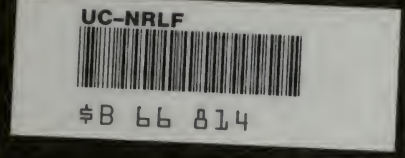

MANUAL

OF THE

FREE HIGH SCHOOLS

OF WISCONSIN

FIFTH EDITION
(REVISED.)

C. P. CARY, State Superintendent.

1906.

MADISON, WIS.:
DEMOCRAT PRINTING CO., STATE PRINTER.
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INTRODUCTION.

This *Manual* is intended to aid in interpreting the laws relating to free high schools, to furnish information regarding their establishment, organization and management and to offer suitable suggestions as to the scope and character of the instruction in such schools.

Part I contains general suggestions and the courses of study; Part II comments on the courses and suggestive methods of teaching; Part III, the laws under which the schools are organized and maintained.

The Manual of the Elementary Course of Study for Common Schools should be consulted and studied for more extended outlines and directions in connection with the work in Reading, Arithmetic, Grammar, Geography, Penmanship, Spelling, Physiology and United States History, and for tests for promotion to high schools. The completion of the course of study for common schools, or its equivalent, is required for admission to high schools.

PART I.

General Suggestions.

GENERAL SUGGESTIONS.

ORGANIZATION.

For guidance in organizing and conducting a free high school, inquirers are referred to Part III of this Manual which contains the laws relating to free high schools. Correspondence is invited by the state superintendent.

QUALIFICATIONS OF TEACHERS.

High school teachers should not neglect or fail to obtain the necessary and proper legal qualifications. *Without such qualification, no valid contract can be made with the high school board, nor is the teacher entitled to pay from the public funds.* Under no circumstances should the work of teaching be entered upon before the proper legal qualification has been obtained.

Any high school board employing a teacher without legal qualification, renders the high school district liable to loss of state aid.

Any one of the following named documents is considered a sufficient legal and educational qualification for the position of principal or assistant in any high school:

1. The Wisconsin unlimited state certificate.
2. A diploma granted upon the completion of a regular collegiate course in the University of Wisconsin, or upon the completion of the full course of any Wisconsin state normal school, *if countersigned by the state superintendent of Wisconsin.*
3. A special license good for one year issued by the state superintendent to the holder of either of the above diplomas.
4. A special license good for two years, issued by the state superintendent and based upon a diploma from a state normal school, located *outside* of Wisconsin, and whose courses of study are fully and fairly equivalent to the corresponding *advanced* courses in the Wisconsin state normal schools.

5. A special license good for two years, issued by the State Superintendent and based upon a diploma from a university or college located outside of Wisconsin and whose courses of study are fully and fairly equivalent to the corresponding courses of study in the Wisconsin State University.

6. A special license good for two years, issued by the State Superintendent, based upon an unlimited state certificate, granted to the applicant by legal authority in another state.

7. An unlimited state certificate, based upon a diploma from a college or university in Wisconsin, whose courses of study are fully and fairly equivalent to corresponding courses in the University of Wisconsin. The holder of this diploma must have successfully taught for at least *one year* in the public schools of Wisconsin, after graduation, before such certificate can be issued.

8. An unlimited state certificate, based upon a diploma from a college or university *outside* of Wisconsin whose regular and collegiate courses of study are fully and fairly equivalent to corresponding courses in the University of Wisconsin. The holder of this diploma must have successfully taught for at least *two years* in the public schools of Wisconsin, after graduation, before such certificate can be issued.

9. An unlimited state certificate, based upon a diploma from a state normal school *outside* of Wisconsin whose courses of study are fully and fairly equivalent to the advanced or four year courses of study prescribed for the Wisconsin state normal schools. The holder of such diploma must have successfully taught for at least *two years* in the public schools of Wisconsin, after graduation, before such certificate can be issued.

10. A special license will be issued by the State Superintendent when recommended by the State Board of Examiners, after said board has passed favorably on the papers, documents, credentials and testimonials furnished by the officers of the institution from which the applicant has graduated, and such other persons as may be named or called upon for reference as to learning, good moral character, ability to teach, ability to govern, and ability to conduct and supervise a school.

LIMITED STATE CERTIFICATES AND ASSISTANTS' CERTIFICATES.

A limited state certificate, gained by examination given by the Wisconsin state board of examiners, qualifies the holder during the life of the certificate for the principalship of a free high school having a three years' course of study only.

A certificate granted upon the completion of the elementary course prescribed for Wisconsin state normal schools, if countersigned by the state superintendent, legally qualifies its holder for the principalship of a free high school having a three years' course of study, but not for the principalship of a high school having a four years' course of study. A special license issued by the state superintendent for one year, to the holder of a Wisconsin normal school elementary certificate, gives like legal qualification to its holder.

Any person desiring to occupy the position of assistant in a free high school, who does not hold (a) some one of the above named documents, or (b) a county superintendent's certificate, as provided by chapter 333, laws of 1895, and laws amendatory thereto, *should first obtain a certificate from the superintendent of the city or county in which he intends to teach*, which certificate should be of the first grade and issued on a written examination.

If his position as assistant requires him to teach branches not named in the certificate thus held or obtained, he will be required to pass a satisfactory examination in such branches under the direction of the state superintendent or present satisfactory evidence of having completed the study of this branch in some accredited institution. The amount of work done and the final standings obtained in each such branch must be presented in evidence. *To enable assistants properly to qualify for their positions, the subjects they are to teach should be determined and made known to them by the high school board as early as possible. High school assistants whose certificates expire June 30th of the current year, should secure certificates for the next year before making a new contract.*

All documents described above are subject to the inspection and approval of the state superintendent, under section 494 of the revised statutes. For this reason every diploma or certificate relied upon as a legal qualification must be forwarded to the state superintendent for approval before its holder can complete a legal contract with any high school board. This requirement does not apply to Wisconsin state certificates, to properly countersigned diplomas, to licenses which have not expired, or to properly countersigned state certificates from other states.

Elementary certificates from normal schools of other states, limited state certificates or limited licenses of any kind from other states can not be given legal recognition.

Special licenses authorizing the licensee to teach a special subject or subjects, such as music, drawing, elocution, manual training or domestic science, in which said licensee has made special and satisfactory preparation, will be granted upon rec-

ommendation of the state board of examiners when complete and satisfactory evidence of such preparation is presented with the application.

For special cases see Chapter 231, Laws of 1905, as printed in this manual in statutes relating to free high schools.

MANAGEMENT.

The high school board should co-operate with the teachers in all important matters and should at all times give them strong and consistent support while exercising authority with which they have been clothed.

Respect for authority should begin with those who are given authority, and should show itself in prompt and willing obedience on the part of teachers and principal to the expressed wishes of the board of education.

All reports required by the principal from teachers, by the board from the principal, and by the state superintendent, both from teachers and boards, should be carefully prepared and promptly rendered. To this end, school records, including final standings, should be posted to date, and books, apparatus and all school material should be frequently inventoried and at all times properly classified.

The principal is responsible to the local board and to the state superintendent:

(a) For the character of the instruction given by himself and his assistants.

(b) For the habits of study, character of recitation, and intellectual and moral progress of each pupil.

(c) For the condition of the building, apparatus, library and closets, and

(d) He is required to see to it that the courses of study adopted by the board and approved by the state superintendent are not changed by omissions, additions, or alterations without the written approval of the state superintendent.

The recitation program should be prepared in accordance with the course of study; should be arranged primarily for the convenience of pupils rather than that of teachers; and should be posted in a conspicuous and permanent place.

It is recommended that all persons occupying the high school room be requested to preserve order at all times. Idle habits are formed and valuable time is wasted in schools where pupils at morning, noon and night loiter in the study room to indulge in noisy chatter and boisterous fun.

COURSES OF STUDY.

The state superintendent is authorized by law to personally supervise the free high schools, and to appoint a person to aid in such duty. Section 496a, (as amended by Chap. 439, Laws of 1901), reads: "The state superintendent shall prepare a course or courses of study suitable to be pursued in free high schools, publish the same and furnish the same upon application. * * * Each free high school shall offer at least a twelve weeks' course of instruction each year in the theory and art of teaching; in the organization, management and course of study of ungraded schools; and in the duties of citizens in the organization and administration of local school systems. Such a course of instruction shall be open to all students in the school."

In compliance with this statute, courses have been published and are commended to the consideration of boards, as recited in form hereinafter.

All courses adopted by boards must be approved by the state superintendent in order that the school may share in the apportionment of the state aid. Any changes in these courses after adoption and approval, without the consent of the state superintendent, will jeopardize the state aid, and no changes in the courses can be approved for operation during a school year. All negotiations for change should be perfected so as to inaugurate actual changes in the course on the opening of the fall term.

It has become an established rule to require every school board to adopt and offer an English course of study which shall contain no foreign language. This rule continues in force except in the case of schools offering a single course. These schools are permitted to offer not more than two years of a foreign language, when, and only when, it is shown by a resolution passed at an annual meeting that the people of the community desire it.

For the four years' English course there must be two teachers,—the principal and one assistant at least,—where in addition to the full work of an English course, two or more years of a foreign language are offered, the services of a second assistant are required. If more than six years of foreign language or other work are offered in addition to the work of the full English course, a third assistant must be procured.

Each high school having a course of three years will be required to have one teacher who shall devote all his time and an assistant who shall devote at least one-half her time to high school work.

Courses of study now in operation in free high schools and approved by the state superintendent, may continue in operation and receive the sanction of this department. The following rules outline the method of procedure of any free high school board when changes in the present courses are desired by them:

I. All proposed changes in courses of study should first be brought to the attention of the state superintendent. When approved by him, a copy of the course as adopted must be signed by the secretary of the board of education, and filed with the state superintendent.

II. New courses should go into force only at the beginning of a school year, and should be put into operation gradually, and in such manner as not to affect the plans of pupils who have already entered upon the work of a former course.

III. No courses will be approved where the teaching force is insufficient for their administration. An increase in the number of the courses of study in a school or an increase in the number of electives where a single course is offered, must carry with it an increase in the teaching force.

Core of Required Work For All Courses.

Every four year course of study shall contain at least fourteen year units of work. Of these the following units of work should be found in every course of study (a unit of work to mean one year's work of one period a day, or 180, or more, recitations). Recitation periods should be not less than 35 minutes in length and a longer period is desirable.

I. Mathematics:—
Algebra, 1 unit.
Geometry, 1 unit..... 2 units.

II. English:—
(Includes literature, literary readings, composition, grammar and rhetoric)..... 2 units.

III. Science:—
(*a*) Physics, 1 unit.
(*b*) Any one of the following sciences, or a combination of not more than two of them. Botany, zoology, physiology, physical geography—1 unit ..... 2 units.

IV. History:—
(*a*) United States history, including history of the constitution, 1 unit.
(*b*) Ancient history, or ancient and medieval, or medieval and modern and English history, 1 unit ..... 2 units.

V. Theory and art of teaching must be offered as an option for at least 12 weeks, or may be required in one or all courses. (See sec. 496a, as amended by chapter 439, laws of 1901.)

VI. In courses offering less than four years of work in a foreign language, there must be at least three units of work in English, and two and one-half units in history.

Options.

Subject to the advice and sanction of the state superintendent, and subject to the conditions herein contained, high schools have the following branches from which to choose in the construction of school courses:

1. Any foreign language.
2. Chemistry or any one of the sciences named in the "Core of required work."
3. History.
4. English.
5. Mathematics.
6. Civics.
7. Political Economy.
8. Psychology.
9. Commercial subjects.
10. Subjects found in Manual Training and Domestic Science courses.

Maximum and Minimum Time Limits.

1. No subject, as a general rule, should be offered for a less time than one-half year. Algebra and geometry should never be required for a period to exceed one and one-half years each.
2. Chemistry, if offered, should be offered for a full year.
3. Not less than two years of any foreign language may be offered.
4. No single science should extend through more than one year.
5. The maximum time for history shall be three years, or four years including civics and economics. Where instruction in American history in the elementary schools is strong, it is advisable to have United States history follow rather than precede European history.
6. Civics and Economics not to exceed one-half year each.
7. Teachers in all branches of study will be held responsible for results in English, and all teachers of Composition and Literature are urged to make an especial effort to improve the organization of this work.

Type Courses of Study.

The following type course is made in accordance with preceding rules, and should be adhered to as closely as possible. The options offered in the course are not intended to encourage or to discourage optional courses in high schools, but are to be interpreted as intended solely to indicate the various opportunities for choice which school boards have in the making of local courses of study.

I. English 1. (Includes Composition and Literary Readings.)
Science 1.
English Grammar 1, or English Grammar ½, Physiology ½, or Latin 1.
Algebra 1.

II. Ancient History 1, or Ancient History ½ and Medieval ½.
Science 1.
English 1.
Arithmetic ½, and Commercial Geography or Book-keeping ½, or Latin 1.

III. English 1, or Latin 1.
Geometry 1.
Medieval or Modern History ½, English History ½,
or
Modern History ½, English History ½,
or
English History ½ and Civics, ½.
Science 1, or Economics ½, and advanced Composition ½ or German 1, or Greek 1.

IV. United States History 1, or United States History ½ and Civics ½.
Physics 1.
Literature 1, or German 1, or Greek 1.
Algebra ½, and Theory and Art and Reviews ½, or Latin 1,
or
Psychology and Theory and Art and Reviews 1.

For guidance in the choice and arrangement of subjects in science and history, see the minimum requirements in "Core of required work." No local course should contain such indefinite terms as "Science," or "History." Indicate the particular science to be offered at any given point.

The following course of study presents a specific application of the preceding and is being, with slight variations, generally adopted. It is printed in this form for convenience and may readily be worked over into the separate English and Science courses when desired.

TYPE COURSE.

FIRST YEAR.

First Semester.	Second Semester.
Required Units.	
English.	English.
Algebra.	Algebra.
Elect Two Units.	
Physical Geography.	Physiology.
Latin.	Latin.
Spelling, Penmanship, etc.	Literary Reading.
Manual Training or Domestic Science.	Manual Training or Domestic Science.

SECOND YEAR.

Required Units.	
Ancient History.	Ancient History.
English.	English.
Elect Two Units.	
Botany.	Botany.
Latin.	Latin.
Arithmetic and Bookkeeping.	Arithmetic and Bookkeeping.
Manual Training or Domestic Science.	Manual Training or Domestic Science.

THIRD YEAR.

Required Units.	
Geometry.	Geometry.
Medieval History.	English History.
Elect Two Units.	
English.	English.
German.	German.
Latin.	Latin.
Economics.	Grammar.

FOURTH YEAR.

Required Units.	
Physics.	Physics.
American History and Civics.	American History and Civics.
Elect Two Units.	
English.	English.
German.	German.
Latin.	Latin.
Advanced Algebra.	Theory and Art.

Note.—In courses offering less than four years of work in a foreign language, there must be at least three units of work in English; English grammar in the third year may count as one-half unit.

Not less than two years of any foreign language will be accepted.

Latin students may elect Advanced Algebra IV in place of Medieval History III.

Where the term "English" appears, work in the study of literary masterpieces, library work, composition, and applied grammar is implied.

Advanced composition is often offered in place of economics.

Unless a sufficient number of students to form a class of fair size, desire to take any given elective course, it should not be offered.

An additional semester of physical geography may be substituted for physiology, and physiology taken instead of first literary reading. If physiology is not given a place in the course as a regular study, special lessons should be given in physiology and hygiene with particular reference to the effects of stimulants and narcotics. These may be a part of the general exercises for which a period of about twenty minutes is allowed in the program of many schools.

RECORDS.

Boards should provide for the high school two record books sufficiently large to serve for several years. In a form like the following, should be kept the term or semi-term standings:

	Arithmetic.			Grammar.			History.			Etc.
A. B.	75 88	83	78	98 83	79	86	88 83	84	83	.....
C. D.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

The other should record the final standings only, and may be ruled as follows:

Name.	Arithmetic	Grammar.	History.	Etc.
J. S.	83	88,	79	

The book records should be kept posted to date, so as to afford reliable references at any time, for promotions, reports, and for granting certificates of graduation.

In place of book records, many of the larger schools are using a card system of records similar to the following. For convenience arrange subjects by years.

Provide a case of two drawers with lock and key. Transfer cards to second drawer when pupils withdraw or graduate. The back of the card can be used for further data. A special card for final standings only is sometimes provided for safety.

Student _____ When born _____ Entered _____

Parent _____ Address _____

(Print here names of all subjects offered in the course, arranged in order of years.)	1	2	3	4	5	(Print here names of all subjects offered in the course, arranged in order of years.)	1	2	3	4	5	(Print here names of all subjects offered in the course, arranged in order of years.)	1	2	3	4	5

Enter Final Standings in column 5 in red ink, or Quarterly Standings in first four columns Enter Term Standings in first three columns.

STANDARD OF ADMISSION.

The standard established in the examination for the organization of the free high school, must not be lowered after the establishment of the school. The minimum of admission to all the free high schools, is the standard prescribed for completion of *The Course of Study for Common Schools.* If pupils whose scholarship is below such common school standard are taught by any high school teacher, an appropriate deduction must be made from the total amount which the board reports expended for high school instruction. This may mean reduced apportionment of state aid.

The following is the summary of the course laid down in *The Manual of the Elementary Course of Study for Common Schools* and will assist in determining the requisites for admission to the high schools. Close study of the Manual will reveal the force and meaning of this summary. References to that publication are inserted to facilitate comparison.

READING.

The pupil should have acquired:

Ability to read intelligently and expressively any selection in the Fourth Reader.

Ability to give a clear statement of the meaning of the words used.

Ability to modulate the voice in stress, volume, pitch, rate, inflection and quality.

Ability to recite with good expression choice selections of prose and poetry equal in amount to six pages of the reader.

Ability to use the dictionary intelligently.

SPELLING.

The pupil should spell correctly through force of habit whatever he writes. He should have the habit of consulting the dictionary in all doubtful spelling. He may be fairly tested by his spelling in examination papers, by a promiscuous list of fifty or more words, and by applying the principal rules of spelling.

WRITING.

The pupil should have the ability to write legibly and neatly, and to prepare papers in good form.

GRAMMAR.

The pupil should be able:

To give clear and grammatical oral and written expression to his thoughts, and to use capitals and punctuation marks correctly.

To use a vocabulary that is sufficient for the precise expression of his thoughts.

To use nouns, pronouns, adjectives, and verbs correctly in the construction of sentences, as suggested in the outline of work.

To separate easy composition into component sentences, sentences into principal and modifying elements, and to apply rules of construction.

GEOGRAPHY.

The pupil should be able:

To read maps readily.

To sketch in outline each of the continents, to state approximately their relative sizes, using Wisconsin and the United States as units of measure.

To locate the system of water-partings and drainage slopes of each continent.

To locate and tell something about some land and water forms,—some city, or other point of interest included in the course of tracing lessons.

To describe important areas of production, especially those of his own country.

To draw a map of Wisconsin from memory, with a fair degree of accuracy.

To comprehend clearly the system of reckoning standard time; also the method of surveying public lands, with practical applications.

ARITHMETIC.

The pupil should show:

Ability to analyze problems involving applications of percentage indicated in the course of study, problems in proportion, and in mensuration of surfaces and solids when geometrical formulas are not employed. This analysis should show a logical train of thought properly expressed.

Ability to indicate by arithmetical symbols the operations necessary to the solution of problems in the classes mentioned above.

Ability to extract square and cube roots by some one method.

Ability to state original practical problems of the various classes indicated in first paragraph, and to solve them.

Skill in writing the various kinds of business forms in common use, and in performing by short methods the computations required in ordinary business transactions.

Ability to define arithmetical terms used, and to state rules for performing operations.

Accuracy and rapidity in performing the work required above, are essential requisites for completion of the work of this Form.

PHYSIOLOGY.

The pupil should be able to give the general structure of the alimentary, respiratory, and nervous organs of the body—their chief functions, the well established laws of health, and the effects of stimulants and narcotics.

CONSTITUTION.

It is expected that both history and constitutions will have been studied before the pupil enters the high school. It is unnecessary to make a summary of the preliminary work that should be done in those branches, but reference is made to *The Manual for Common Schools*, under the head of "Constitutions."

AGRICULTURE.

Agriculture is now a required study in all the district schools of Wisconsin. After the year 1906 pupils graduating from these schools will be required to pass a satisfactory examination in this subject.

PART II.

Subjects and Methods.

SCIENCE.

In teaching the physical and the biological sciences in the high school, two phases should stand out strong. One is the nature side of the work, the other the science side. The nature phases should give the pupil the fullest possible acquaintance with nature in its real manifestations, its phenomena and its sequences. This part of the work can be pursued satisfactorily only in the field and the laboratory. The science side of the work should give the pupil a systematic knowledge of the laws and principles involved and of the established classification of the data of the science. A scientific knowledge of nature in any of its aspects comes from a thoughtful study of its phenomena, from scientific literature, and from instruction.

The study of the text book and scientific literature may give the pupil considerable knowledge of the science, but it will be weak and unsatisfactory unless it is supported by an intimate acquaintance with nature gained at first hand. On the other hand, it is equally objectionable for the pupil to spend his time in the laboratory peering into a microscope or performing experiments without such an accompaniment of the philosophy of things as will enable him to make a broader interpretation of nature, and to gain that culture which comes not simply from things observed but from a knowledge of their significance and relationships.

The laboratory is designed to make the study of nature and the observation of its laws and principles practicable and efficient. Time, however, will not permit of anything like an exhaustive study of nature in this way; hence the few things that are studied should be of the most instructive type and planned with special reference to giving the pupil the best possible knowledge of the science and the largest appreciation of nature. Just as the student of art strives to master model types of form and color, and the student of literature studies to know and appreciate model forms of literature, so the student in the laboratory should come to see and appreciate important types of scientific truth.

The aim in science teaching as in all teaching is to develop in the individual the best and most appreciative correspondence with his environment. To this end, good science teaching should secure to the pupil the following:

1. A correct knowledge of the facts of nature, and a sufficiently extensive acquaintance with these facts to furnish a suitable basis for the study of the science.
2. Skill and facility in the use of aids to the interpretation of nature, as seen in the useful instruments and apparatus of the laboratories.
3. A well grounded knowledge of the simple elements of the science as a science, that is, of the present system of classified knowledge on that subject.
4. Excellence in the use of scientific language as the medium for the exact expression of truth.
5. Training that will make for skill and efficiency in the practical applications of knowledge.
6. Culture, both intellectual and ethical. Among the elements of culture that good science teaching should impart are:
    1. Habits of correct observation.
    2. Power to visualize knowledge.
    3. Due appreciation for the nature and value of evidence as a basis for correct thinking.
    4. Love for and devotion to truth based upon scientifically established premises.
    5. A mind disciplined to presistent and unbiased search for truth.

The pupil's knowledge will be derived from three sources:

1. From observation and induction.
2. From the text books and scientific literature.
3. From instruction.

These three sources should be well balanced since each contributes elements of value not derivable from the others.

Observation and induction implies a good laboratory with good facilities for studying such types of phenomena as will contribute most to the scientific growth of the pupil. It implies also that the supervision in the laboratory will be such as to secure from the pupil the most thoughtful consideration of the phenomena observed.

The text book and scientific literature are the teacher's chief aids in furnishing a carefully collected body of information on the subject, in presenting this information in an orderly and systematic manner, and in contributing suitable material for stimulating and directing interest and observation.

Instruction, the third source, should be used to direct the pupil's mind into the right channels of effort, to correct erron-

eous impressions, and to aid in securing those broad truths and generalizations which may not be obtained without help. Good instruction will do much also to give the pupil an aptitude for the lifelong pursuit of scientific knowledge.

There should be a good reference library for every science taught, and the books should be kept in a suitable case readily accessible to the pupils in their daily work.

The teacher should generally avoid the use of the recitation period for experimental purposes; but when experiments are introduced they should be brief and should afford a simple illustration of an important and not clearly apprehended truth.

Recitations in science should be topical both in the assignment for preparation and in the class room discussion. At the close of the discussion and for review purposes, the quiz finds its proper place and is one of the most important factors in a good recitation in science. It should be sharp and searching, and should show whether the pupil has a clear and presentable knowledge of the truths in question. But the quiz should never be permitted to take the place of individual initiative on the part of the pupil in discussing the topic.

The laboratory work should be closely correlated with the class work. The experiments should be performed under the supervision and direction of a competent teacher. The pupils should be taught by instruction and by example to care for the apparatus and facilities of the laboratory, and should not be permitted to use the laboratory for any but earnest purposeful scientific work. These habits once formed contribute much toward the best scientific spirit and culture. The note book is an indispensable adjunct of good laboratory work and should contain the actual observations made by the pupil during the progress of the experiment. But laboratory work which ends with note book records is a failure. The pupil should be required to make such discussion, oral or written, of his notes and observations as will bring to his consciousness the knowledge of the significance and scientific relationships of the data thus obtained.

PHYSICS.

This subject is almost universally taken during the entire fourth year in the free high schools of Wisconsin. It is not an optional study, but is required of all pupils in all courses.

This latter fact is an especially important factor in determining both the general purposes of the study and the subject matter. The pupils vary greatly in the amount of experience and knowledge which the teacher may assume them to have as a

basis upon which to build. Some of the class may have acquired a large fund of information in regard to the physical facts around them, and may have that interest which will make them ready to do hard, effective work. Others, often a majority, are not possessed of an inquiring mind in this direction; their interest is yet to be aroused; they must be taught the simplest fundamental facts; the circle of their mental horizon must be widened, new interests awakened, and respect aroused for those workers who first found out these things. To such pupils the study is especially valuable, coming as it does just as they are leaving school to carry last impressions away with them.

To reach these results the teacher must constantly keep in mind the need of emphasizing the relations of the study to daily life and interests. Comparatively few high school students are prepared to pursue the subject by exact, scientific, quantitative methods. Perhaps no other study, however, lends itself so readily to such variations of assignment to fit individual needs; thus an experiment may be made qualitative to one pupil and quantitative to another, certain problems and demonstrations be made honorary, etc.

Of all branches in the high school course, physics has perhaps the greatest range of values as a subject for the fourth year in giving review and training in other lines, especially needed at the close of the course, while gaining knowledge of the facts of the science. Such review and training need not hinder the main work, but will rather make it more effective.

One of these secondary lines is that relating to mathematics. Many of the problems, equations, and demonstrations have a practical application which the pupil has, perhaps, never met with before. The arithmetic, algebra, and geometry called for are instruments used for a purpose,—that of securing some definite knowledge. When the student has worked out the various equations of acceleration of force as applied in the laws of falling bodies, and has acquired facility in determining any one of the factors when others are given; or when he has mathematically, graphically and experimentally proved the laws of the inclined plane, and has found that all these methods lead to the same conclusions, mathematics has a significance undreamed of before. Many of the mathematical problems can be verified experimentally. For instance, in the Torricellian experiment, the height of the column of mercury may be found by experiment, the capacity of the tube calculated, and the result verified by weighing the mercury; the accuracy of the whole may be tested by the barometer. Such work, through its definiteness and practical nature, tends to counteract the inclination toward superficiality in the study of a science, making it well-balanced, and giving

training of the highest value. On the other hand, much of the mathematical work given in the majority of the texts in use, is so difficult and deals with units so imperfectly comprehended by the pupil, that the operations become to him a mere indefinite striving after a numerical result, which when it is reached cannot be tested, and means practically nothing to him.

The study of physics also affords excellent opportunity for training in English. The subject is broken up into so many practically independent topics, each leading back to fundamental principles, that it affords the best of material for extended oral and written composition. The study of the compound microscope may serve as an illustration. This naturally begins with the fundamental theory of light, follows through refraction, lenses, and the formation of images, until the full explanation of the instrument is reached. There are many such topics which may be used as material for extended exercises likely to be needed by seniors.

If papers are required they may be written as tests in the school room; or they may be prepared entirely outside and a definite time given for their presentation, as is done in the case of a thesis. Supplementary material and all sources of information should be freely used, and, if thought best, the outline may be worked out in the daily recitation. The final form and language, however, must be the pupil's own.

(See Hall's "Adolescence," Vol. 2, pp. 148–160).

LABORATORY WORK.

From forty to fifty fundamental principles and applications should be thoroughly illustrated by experiments. These experiments should be shown by the teacher, the same or similar ones performed by the pupil, and studied until a clear understanding of their nature and purpose is gained. These do not include all of the laboratory work, but are for the *one object which should be kept steadily in view, the acquirement of an understanding of fundamental principles.* Many of them give opportunity for either qualitative or quantitative treatment, and (if the class has the proper school spirit) the abler pupils can be easily led to do more advanced work than can be done by the rest of the class.

The following list includes more than the number indicated above, and selections may be made to suit conditions:

Presence of superficial films.
Contractility of liquid films.
Diffusion of liquids.
Capillary attraction.
Composition of three forces in a plane.

The pendulum—law of length.
Pulleys.
Levers.
Pressure of liquids in all directions.
Transmission of pressure in liquids.
Pressure on bottom of vessel.
Upward pressure in liquids.
Effect on weight of a body by submerging it in different liquids.
Principle of Archimedes.
Specific gravity of a solid heavier than water.
Specific gravity of a solid lighter than water.
Specific gravity of a liquid.
Specific gravity of a substance which will dissolve in water.
To show that a floating body will sink until it displaces its own weight of the liquid.
Barometer.
Siphon.
Tension of confined gas (air).
Boyle's law.
Boiling point and pressure.
Testing a thermometer.
Dew point.
Fluid currents caused by heat.
Expansion by heating.
Heat of fusion of ice.
Number of vibrations in tone.
Vibration in segments of cords and plates.
Resonance of air column.
Vibrating strings—law of length.
Vibrating strings—law of tension.
Umbra and penumbra of shadow.
Images by apertures.
Intensity of light at different distances.
Photometer.
Regular and irregular reflection.
Refraction of ray of light in water.
Position of image in plane mirror.
To show experimentally, facts demonstrated graphically in regard to the formation of images in concave and convex mirror.
Location of image formed by convex lens
Kinds and action of electricity by friction.
Polarization by induction.
Charging by induction.
The simple voltaic cell.
Electrolysis.
Lines of force in a magnetic field.
Lines of force around a wire carrying a current.
Electromagnet.
Effect of cutting lines of force by a closed coil.
Effect on secondary coil of making or breaking circuit in primary.
Heating and lighting effect of current due to resistance.

LABORATORY EQUIPMENT.

Apparatus should be selected for service, not for show. Hence, every piece purchased should be substantially made and should be well calculated to aid in the study of some important physical principle. Generally, in purchasing a first equipment it will be best for schools to be guided in the selection by such a list as that presented below. The list includes standard apparatus that has come into use in the best high school laboratories of the country. It represents a fairly good equipment for a new high school, both for variety and for completeness, but should be added to as the school advances. The entire list named can be purchased for from $250 to $300.

List of Apparatus.

For work in general physical measurement.
- Meter sticks sufficient to supply class.
- Vernier caliper, metric system.
- Graduated glass cylinder, 500 cc.
- Graduated glass cylinder, 100 cc.
- Graduate English measure.
- Set liter measures.
- Jolly balance, cheap form.
- Harvard balance.
- Horn pan balance, 6 in.
- Spring balance, 30 lb , 15 kg.
- Three spring balances, 8 oz., 250 g.
- Set universal iron weights with hooks 10 g. to 1 kg.
- Set brass weights, in block, 100 grams to 1 centigram.
- Set avoirdupois weights, 1 oz. to 2 lbs., with hooks.
- Iron support.
- Iron tripod.

For work in mechanics of solids.
- Set pulleys—1 fixed single, 1 mov. single, 1 each double, 1 triple.
- Wheel and axle.
- Iron ball 4 in. in diameter, with hook.
- Small brass ball with hook to use for experiments with pendulum.

For work in mechanics of fluids.
- Universal Hydrometer, that is one that may be used for liquids either lighter or heavier than water.
- Boyle's law tube.
- Set capillary tubes.
- Air pump.
- Seven-in-one apparatus.
- Barometer tube.
- Pascal's vases.

For work in sound.
- Sonometer.
- Tuning fork, 256 vibrations.
- Second tuning fork of different pitch.
- Tall glass cylinder without lip, 50 cm. or more high.
- Whirling machine.

Savart wheel for whirling machine, 4 rows holes.
Chladni's plate with clamp.
Cello bow for Chladni's plate.

For work in heat.

Thermometer 3 scale.
Two chemical thermometers, double scale.
Glass bulb, about 100cc., with long stem for use as air thermometer and for study of liquid and gas expansion, etc.
Apparatus A.
Ball and ring for studying expansion of solids.
Pulse glass.

For work in light.

Lamp.
Concave and convex mirror.
Set lenses.
Glass prism.
Color discs.

For work in electricity and magnetism.

Glass rod, rubber rod, catskin, and pieces of flannel and silk cloth.
Frictional machine.
Insulated conductor.
Leyden jar.
Demonstration voltaic cell.
Battery, 6 cells.
Bar magnets in box.
Horseshoe magnet.
Electro magnet.
Primary and secondary coil.
Induction coil, ¼ in. spark, sliding coil.
D'Arsonal galvanometer, cheap form.
Magnetic compass.
Resistance box 1 to 100 ohms (cheap form).

The following are some of the pieces which should be added as soon as circumstances will permit:

Model steam engine.
Electric bell.
Telephone.
Telegraph.
Dynamo, motor, etc.

In addition to the above there should be the equipment of ordinary supplies of glass and rubber tubing, plain and insulated wire of different sizes, corks, mercury, sheet rubber, etc., and a few tools such as pincers, hammer, saw, plane, stock and bits, etc.

Some of the pieces in the list which are used in individual experiments should be duplicated, unless the school is very small.

SUGGESTIONS.

The field of original investigation is beyond the high school student; it belongs to the college post-graduate.

Experiments for display and entertainment are appropriate for evening shows, but are not productive of the best results for the student of science.

Laboratories should be provided with suitable tables and blackboards. They should be well lighted and provided with means for darkening the windows.

The pupils can, under the direction of the teacher, make much simple but useful apparatus outside of school hours. The caution here is, however, to employ the pupils as students of science, not as carpenters and blacksmiths.

PHYSIOLOGY.

The work in physiology should cover, in a general way, the work outlined in any good text-book. The study should be made as objective as possible, special emphasis being given to diagramming organs and systems at the time they are studied, and suggested experiments made when possible. Too much attention should not be given to details, but the fundamentals should be thoroughly taught.

The work should give to the student a clear idea of the living body, the divisions of bodies into organic and inorganic, into plants and animals; of what is meant by the structure of a body, anatomy, physiology, hygiene, cell tissue, membrane, gland, muscle, tendon, blood vessel, nerve, lymphatic, bone, and joint. There should also be a clear notion of the kinds of work done in the human body and of the systems by which it is accomplished.

The knowledge of the digestive system should include a knowledge of what constitutes food, and the classes of food which are taken into the system, together with a knowledge of the system as a whole, the function and structure of its organs, including the mouth, tongue, teeth, salivary glands, pharynx, esophagus, stomach, pancreas, liver, small intestine, and large intestine. There should also be a clear understanding of and ability to diagram the two routes by which the digested food goes into circulation (by blood vessels and lymphatics), as well as the ability to trace the steps in the digestion of the different classes of food, and to state the laws of hygiene for the system.

In connectfon with the circulatory system, students should be able to give the plan of the system as a whole, the function and structure of the organs of circulation, including the heart, arteries, capillaries, and veins; to show the structure, composition, and function of the blood, and to explain by diagram the pulmonic and the systemic circulation, to show the changes

which the blood undergoes in the lungs and capillaries, how animal heat is produced and how regulated, and what is meant by congestion, inflammation, a cold, and a fever.

A knowledge of the respiratory system should include a knowledge of the purpose of respiration, the structure and function of the organs of the system, the movements in respiration, the chemical changes which result from it, the consequent importance of ventilation, and Nature's provisions for keeping the air pure. The dissection of the heart and lungs of a sheep or other mammal, and a diagram of the circulatory and respiratory systems combined, would be of value to the student at this point.

The study of the secretory system should result in knowledge of the secretory organs and the functions of their secretions. The organs thus studied should include the muncus and serous membranes, synovial membranes, salivary glands, lining membranes of the stomach and intestines, liver, pancreas, oil glands, lachrymal glands, and the lining of the ear.

The knowledge of the absorbent system should include the method by which the waste matter is taken from the tissues and expelled from the body as perspiration, and by the lungs, and kidneys. In this connection, there should be a study of the skin, its structure, appendages, and functions.

As the result of the work on the osseous system students should be able to give the composition, structure, classes, and use of bones; the parts of the skeleton in the head, trunk, upper and lower extremities; means by which parts of the skeleton are united, kinds of joints, and the hygiene of bones, especially with relation to children.

For the muscular system there should be a knowledge of the structure, function, general arrangement, position, and attachment of muscles, together with rules of hygiene, in connection with exercise and rest.

As a result of the study of the nervous system, the student should be able to show the necessity of a nervous system, to diagram in a general way the cerebro-spinal and the sympathetic systems, to describe the two kinds of nerve tissue, with the function of each, to illustrate and explain what is meant by an impression, sensation, and reflex nervous action; to diagram and state the function of the parts of the brain and spinal cord, to describe by diagram the crossing of the nerve fibers in the cord and the medulla oblongata, and to show the effect of injury to either side of the brain or spinal cord, and to trace the course of the nerve current in reflex action; to show the knowledge gained through each sense acting alone, and to diagram the nerves of the ear and eye, describing by means of the diagrams acts of hearing and of seeing, and to show reasons for defective hearing and vision.

There should be a clear notion of the action of alcohol and other stimulants and narcotics upon the human body.

PHYSICAL GEOGRAPHY.

This is a branch of study that involves the elements of all the sciences. It is therefore necessary for the instructor before he begins the subject to ascertain what knowledge the pupils have of botany, physics, geology, astronomy, chemistry, etc. If they have had training in nature work and elementary science in the grades, the study of physical geography may not be found difficult.

The aim of the teacher in physical geography should be to have the pupil acquire a knowledge of the relation of earth to man, which must necessarily involve a thorough study of the immediate environment of man.

After establishing a definite aim for each recitation, the teacher should carefully ascertain what things the pupil must know in order to realize this aim; what of these things *are now known*, and proceed accordingly with the instruction, teaching what remains to be known.

As text-books differ in the subject-matter treated, it is recommended that the study of physical geography shall include the following general considerations, consuming the time allotted to the subject in the high school.

1. The earth as a planet and its relation to the solar system.
2. A brief geological history of the earth with special reference to Wisconsin and the United States.
3. The land distribution and the relief of its various divisions,—volcanoes and earthquakes.
4. The water distribution, continental drainage, erosion, waves, tides, ocean currents, glaciers, and geysers.
5. The atmospheric movements and their causes, with a careful study of climate and its causes.

If time permits, the following subjects may be pursued:

6. The human race as distributed.
7. The animals and plants as distributed.
8. The economic products, including variety of soil, distribution and use of coal, ores, building stone and natural gas.

The practical side of the subject should not be neglected. The rivers, creeks, lakes, hills, valleys, railroad cuts, storms, the sky, day and night,—all furnish an opportunity for personal observation. The laboratory will probably furnish apparatus for demonstration, such as:

A thermometer.
A barometer (its construction should be taught).
A centrifugal hoop.
An electrical machine.

Bar magnets.
Magnetic needles.
Ball and ring to show expansion and contraction.
Air pump.
A prism or spectroscope.
Relief maps, a good globe or tellurian, and a spherical blackboard are needed in this study.

BOTANY.

The work in botany in the high schools of the state is not uniform either in regard to the subject matter or to the method of treatment. Much of this difference must necessarily continue to exist, since a school thoroughly equipped with apparatus and having a special teacher naturally can undertake a more extended line of work than one not having these facilities. Authorities, too, differ widely in their views as to how the subject should be treated, and even the same author sends out several editions of his text with many changes.

Under these conditions no definite course can be outlined which will apply to all schools. Certain general conclusions may be stated; however, which will serve as a guide in the selection of texts and in determining what to take and what to omit from any given book. The work should begin with what the pupil has seen, or with what he readily can see with the simple dissecting glass. Neither the schools nor the teachers are ready for the scientific work needed in beginning with the lower forms of life. The compound microscope is not a suitable instrument for use by pupils in the first or second year of the high school in doing independent and original work in the study of the minute structure of plant life. It has a legitimate place, however, in demonstrating facts learned by pupils in regard to minute structures.

The course should include some study of the lower forms, especially of such fungi as have great economic importance such as bacteria, yeast, various rusts, and mushrooms. These should be studied in their gross forms without using the compound microscope other than as indicated above.

In localities in which farming is of great interest, agricultural botany should be made prominent. If a year is given to the subject, as is now so commonly done, during the winter some time may well be given to the definite study of agriculture using a text book as a basis; as much time will still be left for botany as has been generally given in the past. Again, instead of stock specimens for study and illustration, plants which are of economic interest as friends or foes should be used. They should be studied fully, not only as to their

anatomy and morphology, but alsotheir physiology and ecology. Some time should be given to a study of the more prominent flora of the home region including the characteristics and appearance of the trees, woods, etc.

Such work is better adapted to the smaller and medium-sized schools than the extended work in the lower forms so often undertaken. Large and well equipped city schools where agricultural interests are not prominent, may, profitably perhaps, do more with lower forms.

The following is a course adopted with more or less modification in a large number of states, and represents substantially the attitude of botanists in this country in regard to the content of a one-year course.

The division into parts is not intended to imply that each topic is to be studied separately. The morphology, physiology and ecology should be treated as needed in the study of the plant.

As stated above, it is not expected that any but the largest and best equipped high schools will undertake the extended study of the lower forms. (See Hall's "Adolescence" Vol. 2, p. p. 148–160: (Appletons), and "Lloyd and Bigelow's" "Teach- of Biology", p. p. 125–128.)

A. MORPHOLOGY.

1. *The seed.* Four representatives (dicotyledon without and with endosperm, a monocotyledon, and a gymnosperm); structure and homologous parts. Food supply; experimental determination of its nature and value. Phenomena of germination and growth of embryo into a seedling (including bursting from the seed, assumption of position, and unfolding of parts).
2. *The shoot.* Gross anatomy of a representative shoot; the arrangement of leaves and buds on the stem; and deviations (through light adjustment, etc.) from symmetry.

Buds and the mode of origin of new leaf and stem; winter buds in particular. Specialized and metamorphosed shoots (stems and leaves). General structure and distribution of the leading tissues of the shoot; annual growth; shedding of bark and leaves.

3. *The root.* Gross anatomy of a representative root; position and origin of secondary roots; hair-zone, cap and growing-point; origin of new roots.

Specialized and metamorphosed roots. General structure and distribution of the leading tissues of the root.

4. *The flower.* Structure of a representative flower, especially of ovule and pollen; nectar glands; functions of the parts.

Comparative morphological study of six or more different, marked types, with the construction of transverse and longitudinal diagrams.

5. *The fruit.* Structure of a representative fruit, especially with reference to changes from the flower, and from ovule to seed. Comparative morphological study of six or more marked types, with diagrams.*
6. *The cell.* Cytoplasm, nucleus, sap-cavity, wall. Adaptive modification of walls, formation of tissues.

The precise sequence of topics in the above outline is not a matter of importance. The study of the cell should not be postponed for consideration by itself after the other topics, as its position in the above outline may seem to imply, but should be brought in along with the study of the shoot or root and continued from topic to topic. Although enough study of the individual cell is to be made to give an idea of its structure (a study which may very advantageously be associated with the physiological topics first mentioned under B) the principal microscopical work should consist in the recognition and study of the distribution of the leading tissues.

B. PHYSIOLOGY.

1. Role of water in the plant; absorption (osmosis), path of transfer, transpiration, turgidity and its mechanical value, plasmalysis.
2. Photosynthesis: dependence of starch formation upon chlorophyll, light, and carbon dioxide; evolution of oxygen; observation of starch grains.
3. Mineral nutrition: ability of green plants and inability of non-green plants (fungi) to thrive upon the carbon dioxide of the air and mineral solutions.
4. Respiration: necessity for oxygen in growth, evolution of carbon dioxide.
5. Digestion: digestion of starch with diastase, and the role of digestion in translocation of foods.
6. Irritability: geotropism, heliotropism, and hydrotropism; nature of stimulus and response.
7. Growth: localization in higher plants; amount in germinating seeds and stems; relationship to temperature.
8. Fertilization: sexual and vegetative reproduction.

Although for convenience of reference, the physiological topics are here grouped together, they should not be studied

* This comparative morphological study of flowers and fruits may advantageously be postponed until it can be taken up in connection with classification of the angiosperms.

by themselves and apart from anatomy and morphology. On the contrary, they should be taken up along with the study of the structures in which the processes occur, and which they help to explain; thus photosynthesis should be studied with the leaf, as should also transpiration, while digestion may best come with germination, osmotic absorption with the root, and so on. The student should either try, or at least aid in trying, experiments to demonstrate the fundamental processes above.

C. Ecology.

1. Modifications (metamorphoses) of parts for special functions.
2. Dissemination.
3. Cross-pollination.
4. Light relations of green tissues; leaf mosaics.
5. Plant societies; mesophytes, hydrophytes, halophytes, xerophytes; climbers, epiphytes, parasites (and saprophytes), insectivora. Symbiosis.
6. Plant associations, and zonal distribution.

The topics in ecology, like those in physiology, are to be studied not by themselves, but along with, and in dependence upon, the structures with which they are most closely connected; as, cross-pollination with the flower, dissemination with the seed, etc. (5) and (6) may be studied most advantageously when the student is dealing with systematic groups under angiosperms, and are to be considered as recommended rather than as required.

In this connection field work is of great importance, and for some topics, such as (6) indispensable, though much may be done also with photographs, museum specimens, and potted plants in greenhouses. Every effort should be made to make the field work in ecology systematic and definite. The temptations to haziness and guessing must constantly be combated.

The study of systematic groups should be a comprehensive summary based upon the thorough study of the structure, reproduction, and adaptations to habitat of types from each group, supplemented by more rapid study of other forms in these groups. Where living material is wanting, some use may be made of preserved or even pictured materials. A standard text-book should be carefully read. The general homologies from group to group should be noted.

In general, in this part of the course, much less attention should be given to the lower, difficult, and inconspicuous

groups, and progressively more to the higher and conspicuous forms, and at least one-third of the time devoted to the groups should be given to the spermatophytes.

Attention should be called throughout to the economics (relations to man's good and injury) of the forms and groups studied.

Following is a list of recommended types from which selections may be made:

D. *In Classification.*

1. Algae Pleurococcus (or sphaerella), spirogyra, vaucheria, Cladophora, Fucus, Nemalion (or Batrachospermum or Chara or Polysiphonia or Coleochaete).
2. Fungi. Bacteria, Rhizopus, Yeast, Puccinia (or any Powdery Mildew), Mushroom.
   Bacteria and Yeast have obvious disadvantages in such a course, but their great economic prominence may justify their introduction.
3. Lichens. Physcia (or Parmelia).
4. Bryophytes. In Hepaticae, Radula (or Porella or Marchantia). In Musci, Mnium (or Funaria or Polytrichum).
5. Pteridophytes. In Filicineae, Aspidium (or equivalent), including of course the prothallus.
   In Equisetineae, Equisetum.
   In Lycopodineae, Lycopodium, and Selaginella (or Isoetes).
6. Gymnosperms. Pinus or equivalent.
7. Angiosperms. A monocotyledon and a dicotyledon, to be studied with reference to the homologies of their parts with those in the above groups; together with the representative plants of the leading subdivisions and principal families of angiosperms.

Classification should include a study of the primary subdivisions of the above groups, based on the comparison of the types with other (preferably) living or preserved material. The principal subdivisions of the spermatophytes, grouped on the Engler and Prantl plan, should be understood.

The ability to use manuals for the determination of the species of flowering plants is not considered essential in this course, though it is desirable. It should not be introduced to the exclusion of any other work, but may well be made voluntary work for those showing a taste for it. It should not be limited to learning names of plants, but should be made a study in the plan of classification as well.

The preparation of an herbarium is not required nor recommended except as voluntary work for those with a taste for collecting. If made, it should not constitute a simple accumu-

lation of species, but should represent some distinct idea of plant associations, of morphology, of representation of the groups, etc.

NOTE.—The classification is given here to show the entire course as published, and not with the thought that the work in the lower forms will be given except as indicated in the introductory directions.

REFERENCE BOOKS IN BOTANY.

Coulter:
Plant relations—Appleton.
Plant structures—Appleton.
Bailey, Lessons with plants—Macmillan.
Bergen, Glimpses of the plant world—Ginn.
Gray, Lessons in botany American Book Co.
Allen, The story of the plants—Appleton.
Campbell, University text-book of botany—Macmillan.
MacDougal, Experimental plant physiology—Holt.
Gray, Field, forest, and garden botany - American Book Co.
Schimper, Plant geography—Clarendon Press.
Bailey, Garden making—Macmillan.
Lubbock, Flowers, fruits, and leaves—Macmillan.
Conn, The story of germ life—Appleton.
Pruden, T. Mitchel, Dust and its dangers—Putnams.

THEORY AND ART OF TEACHING.

Section 496a (as amended by Chapter 439, Laws of 1903) requires each free high school to offer at least a twelve weeks' course of instruction each year in the theory and art of teaching; in the organization, management and course of study of ungraded schools; and in the duties of citizens in the organization and administration of local school systems. Such a course of instruction shall be open to all students in the school, and a satisfactory standing in the work of this course shall be a condition precedent to the countersignature of a diploma held by a graduate of the school as prescribed in Section 7 of this act."

It should be understood by teachers and members of school boards that this is not a study which is of value to those pupils only who expect to teach in the schools of this state. The pupils in the public schools will soon be in positions where they will be responsible for the development and maintenance of those schools. The work in Theory and Art of Teaching may be so broadened as to include a consideration of the proper organization of the public schools, the necessity for an intelligent interest in their welfare, and in what is necessary to secure that welfare.

This subject if properly taught, may afford as valuable a training for citizenship as any in the course; it is also of high value as a disciplinary study.

The best text book for use in the study of pedagogy is the Manual of the Course of Study for Common Schools issued by the state superintendent. It should be made the basis of the work in this subject. As an aid to the study of the Manual a good reference library should be provided, containing texts on school management, pedagogy, courses of study, etc.

In the study of the Manual the teacher should emphasize the following:

I. *How to study the Manual.* See that the pupils are familiar with the uses of the numbered paragraphs for cross references, and the meaning of the divisions of each subject; (a) primary form, (b) middle form, (c) upper form.

II. It will be observed that each subject has a general aim with which the pupil should be familiar. Each form has also the three following divisions:
   (a) The specific purpose in the work of each subject in each form.
   (b) A course of study with suggestions to teachers upon the same.
   (c) Tests for promotion.

III. Before leaving the study of the Manual the members of the class should be familiar with the tests for promotion of pupils from each form in all the branches taught in the public schools.

IV. Drill work with the class in pedagogy in daily recitation plans should give definite ideas of the aim to be accomplished, and the method of reaching it.

When time permits it will be advisable to take the class to observe the lower grades and to see the principles of the Manual exemplified. Some schools carry on practice work in the grades, but this proceeding is of questionable value unless it shall be directed and personally supervised by the principal.

When the study of library reading is begun it will be well for the teacher to have a copy of the List of Books for Township Libraries, prepared by the state superintendent, accessible to the members of the class. Some of the books found in this list can probably be obtained from the school library, and definite instruction as to the best use of these books should be given.

MATHEMATICS.

ARITHMETIC.

Before leaving the high school the students should be able, with *accuracy and rapidity*, to perform operations in reduction, addition, subtraction, multiplication, and division of simple numbers, of fractions, of decimals, and of denominate numbers. He should possess skill in factoring numbers; should be able to find the L. C. M. by inspection of all numbers of two orders; should be skillful in extraction of square and cube roots; measuring and finding areas of rectangles, triangles, and circles; in measuring and finding volumes of rectangular solids, cylinders, cones and spheres.

He should be able to form and solve proportions and to analyze problems giving rise to proportions.

He should know the fractional equivalents of the different per cents. commonly used, as well as he knows the multiplication table; be able to find readily any per cent. of a number; to find any number, knowing any per cent. of it; to find what per cent. one number is of another. The student should be able to change problems under each of these three general cases to problems in common fractions and in decimal fractions, and to solve them as such. He should be able to apply the principles of percentage to operations in profit and loss, commission, trade discount, insurance, and taxes, and should be master of one good method of computing interest, and be able to determine the amount due on a note on which partial payments have been made.

When dealing with small, simple whole numbers, and with common fractions whose denominators are twelve or less and with small compound denominate numbers, he should be able to secure correct results rapidly without written work.

He should be able to give a clear analysis of the work in solving practical problems, and to state in order the processes in-

volved in the solution of problems, not only when the work has all been performed, but when it is indicated without being performed.

Much time will be saved in the work in arithmetic, if the student will learn to perform the fundamental operations accurately, and in the later portions of his work, indicate or state the operations to be performed in the solution of problems without actually performing them.

Mental training arises more largely from determining what operations are to be performed under certain conditions, than in the mechanical performance of the operations which are always those of addition, subtraction, multiplication, or division.

The student should have the power to state and solve original problems, to illustrate general principles and to furnish opportunities for applying the rules for special cases.

He should be able to state clearly, concisely, and accurately, the definitions of terms commonly used in arithmetic, and to illustrate their meaning by examples or otherwise.

Unless he can improve upon the definitions given in the books, he should learn them as there stated. This statement also applies to the rules for performing operations.

It is not meant that the student should learn the words of the book without a knowledge of their meaning, but that he should understand the meaning of terms in arithmetic and know how to perform operations; then if he cannot improve upon the formulation of definitions and rules given in the books, he should learn those as the orderly statement of what is in his mind. In the solution of problems, students should be able to give reasons clearly and readily for each operation.

Good oral and written expression is as essential as the ability to solve difficult arithmetical problems.

ALGEBRA.

It is now generally recognized that the first year is not suffient time to give the knowledge of algebra which should be had by students completing a high school course, especially if they wish to attend a higher school. Accordingly, all of the newer courses provide for an additional semester in the senior year, during which a review of the fundamental principles as well as new topics may be given.

OMISSIONS.

Certain omissions may be made in the first year from the work as usually given in text-books, and the time so saved may be used in giving greater thoroughness in what may be called the fundamentals of algebra.

By this it is not at all meant that dawdling is to be permitted.

By dwelling too long at the beginning upon mechanical operations which are in constant use throughout the subject, time is often wasted. Thus multiplication and division need comparatively little time at the first reading, since there is constant practice afterward.

The principal omissions are as follows:

1. Many of the numerous definitions given at the beginning of most books may be either omitted entirely from the first year or touched on very lightly and reviewed when needed. Such for example, are the definitions of algebra, known and unknown quantities, prime quantities, signs of equality, degree of a term, homogeneous terms, reciprocals, etc. Caution: Certain other definitions are fundamental and should be memorized in an exact form and thoroughly mastered through abundant illustration and constant drills. Among these are factor, power, root, coefficient, positive integral exponent, term, the common signs, and others which will readily occur to any skillful teacher.
2. Extended explanations and proofs of laws of operations.
3. Long and involved examples.

NOTE.—Many text-books give such examples, especially in removing signs of aggregation, in multiplication and division, in complex fractions and in exercises giving practice in equations. In such work the pupil loses sight of the purpose of the example and becomes absorbed in the intricate operations necessary to get the answer.

4. All examples in addition, subtraction, multiplication, division, and factoring containing literal exponents unless they are in very simple form.
5. All unusual forms in factoring.
6. The "second method" in H. C. D. and L. C. M.
7. Certain whole classes of problems in equations, clock problems, fox and hound "leap" problems, and "train" problems may in most classes be omitted in first year work and used as fresh exercises in giving review in last year.
8. Non-practical problems whenever more suggestive ones can be found.

WHAT TO TAKE IN THE FIRST YEAR.

1. Fundamental definitions and principles thoroughly mastered as indicated in 1 above.
2. In every topic numerous short examples illustrating the principles under consideration. The teacher should make this work of such a character as will require close attention and vigorous and intensive thought on the part of the pupil.
3. Exercises throughout the work involving translation of algebraic into common language or *vice versa*. Such translations are especially valuable as exercises in English.
4. Fundamental operations, including the usual special rules. (See Note 3 in omissions.)
5. Factoring including
   (a) Trinomial squares.
   (b) The difference of two squares.
   (c) A trinomial whose first term is a square and whose last term is a product of two factors whose sum into the square root of the first term equals the second term.
   (d) The sum or difference of two cubes.
   (e) The sum of the same odd powers of two quantities.
   (f) The difference of the same powers of two quantities.
6. H. C. D. and L. C. M. by method of factoring only.
7. Fractions (See 3 in omissions.)
8. Simple equations. (See 7 in omissions.)
9. Involution and evolution. (Integral positive exponents only).
10. Radicals.
    (a) Meaning (without proof) of different exponents.
    (b) Simple work in reduction and fundamental operations. (See 3 in omissions.)
11. Solution of simple quadratic equations. Solution of affected quadratic equations by completion of the square. (Easy examples.)

The above indicates a minimum of work for the first year, and gives a sufficient knowledge of algebra for use in the succeeding years of the high school. More extended or difficult work may often be given to the stronger members of the class.

The proper assignment will always provide material suited to the varying capabilities of the class. It must give the strongest members sufficient work, and at the same time it must include a definite connected treatment of the topic in hand simple enough for the weaker pupils. The character of

the student's work in algebra depends as largely upon his ability to make correct, clear and concise statements of definitions, processes or rules, and steps in the performance of algebraic operations in the solution of problems, and in general demonstrations, as in his ability to perform operations, to solve problems, and to give demonstrations.

The advanced work of the fourth year should include

(a) A brief review of the essentials of the first year with more attention to proofs and underlying reasons.
(b) Radicals and quadratics including simultaneous quadratic equations.
(c) Ratio and proportion and variation.
(d) Arithmetical and geometrical progressions.
(e) Binomial theorem for positive integral exponents.
(f) Logarithms including use of tables in simple numerical work.
(g) Graphs introduced in connection with above advanced work.

GEOMETRY.

At the mathematical conference of the college and high school section of the State Teachers' Association held in Milwaukee in December, 1903, a committee was appointed to prepare a year course in plane and solid geometry. This committee consisted of Messrs. E. B. Skinner, chairman, C. H. Chandler, W. C. Hewitt, and J. H. Hutchison. The accompanying list of propositions presented to the conference by the committee in December, 1904, was adopted by the conference.

In making its report, the committee presented certain recommendations designed to explain and to supplement the report. What follows contains the gist of these recommendations.

1. Pupils should be carefully drilled in the matter of axioms, postulates, and definitions, and should be made to understand as early as possible the part these play in the development of the subject.
2. It is not desirable to abridge materially the work in the earlier part of the course as laid down in the best textbooks. It is necessary to go carefully over a fairly large number of elementary propositions in order to make the pupil realize the nature of demonstration.
3. The committee recommends that, so far as possible, a single fact should be stated in each theorem. The simpler the statement, the more easily its meaning will be grasped by the pupil. When some progress has been made it will be a useful exercise to attempt to combine the subject matter of several theorems into a single statement, but not before.

4. The term "corollary" should be reserved to designate a truth that really does follow from the main theorem as an obvious consequence, and not a truth requiring a more or less difficult demonstration.
5. The course as presented should be supplemented by not less than one hundred exercises and problems of a fair degree of difficulty. Too much emphasis cannot be laid upon this point. One hundred should be regarded as the minimum to be covered by the slowest members of the class. Brighter pupils will do considerably more. *It is in this way that the course can be made elastic and adapted to the varying abilities of the pupils.*
6. The solutions of many of the theorems should be merely suggested to the pupil and in other cases he should be required to furnish the demonstration without any other than brief oral directions given on the day preceding that on which the demonstration is to be presented by him. This will of course be next to impossible if a book giving full demonstrations is in his hands.
7. The wide awake principal will see to it that so far as possible, pupils should have some notion of the form of the more common plane figures and, possibly a few of their more elementary properties, before entering upon the work in formal geometry. The committee does not, however, recommend the establishment of courses in so-called concrete or inventional geometry. The required preliminary knowledge can easily be imparted to the pupil in connection with the arithmetic of the grades.
8. The teacher must never lose sight of the fact that knowing geometry does not consist in a more or less accurate knowledge of any given set of theorems, but in the ability to grasp firmly and clearly the underlying processes and concepts, and to see quickly the method of attack when a new problem is presented. For this reason teachers are urged strongly to use their own judgment in the matter of the use of this report. Other selections may be better, and the teacher who takes the time and trouble to make out his own list will surely find that the results will be better than if he were to accept without question the report of this or any other committee.

Report of the Committee appointed to select theorems for a year course in Geometry.

(Read before the Mathematics Section of the Wisconsin State Teachers Association, December 28, 1901.*)

PLANE GEOMETRY.

1. At a given point in a line, one and only one perpendicular to the line can be erected.
2. The sum of the adjacent angles which one line makes with another equals two right angles.
   - Cor. 1. The sum of all the angles having a common vertex and lying on one side of a straight line is equal to two right angles.
   - Cor. 2. The sum of all the angles formed about a point in a plane equals four right angles.
3. Opposite or vertical angles are equal.
4. Two triangles having two sides and the included angle of the one equal to two sides and the included angle of the other are congruent.
5. Two triangles having one side and the two adjacent angles of one equal to a side and two adjacent angles of the other are congruent.
   - Cor. Two right triangles are congruent if the hypotenuse and an acute angle of one are equal to the hypotenuse and an acute angle of the other.

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* To save space in printing, the theorems are in many cases merely named, and in other cases the statement is abbreviated as much as possible. The careful teacher will in every case insist on a clear, clean cut, and rigorous statement of every theorem, and in no case will he accept the form of statement here given if that statement is in any way incomplete.

6. The angles opposite the equal sides of an isosceles triangle are equal.
7. The distances from any point in a perpendicular at the middle point of a straight line to the extremities of the line, are equal, and the distances from any point without the perpendicular are unequal.
8. The locus of a point equidistant from the extremities of a right line.
9. Two triangles having the three sides of the one equal respectively to the three sides of the other are congruent.
10. Converse of 2.
11. From a point without a straight line one and only one perpendicular can be let fall to the line.
    Cor. Two perpendiculars to the same straight line are parallel.
12. Two right triangles are congruent if the hypotenuse and a side of the one are equal to the hypotenuse and a side of the other.
13. If two triangles have two sides of one equal respectively to two sides of the other, and the included angles unequal, the triangle which has the greater included angle has the greater third side.
14. If two triangles have two sides of one equal respectively to two sides of the other, and the third sides unequal, the triangle which has the greater third side has the greater included angle.
15. If two parallel lines are cut by a transversal (1), the alternate interior angles are equal; (2), the corresponding angles are equal; (3), the interior angles on the same side of the transversal are supplementary.

16–18. Two straight lines are parallel when they are cut by a transversal (1), so that the alternate interior angles are equal; (2), so that the corresponding angles are equal; (3), so that the interior angles on the same side of the transversal are supplementary.

19. If the sides of an angle are respectively perpendicular to the sides of another angle, the angles are either equal or supplementary.
20. Any exterior angle of a triangle is equal to the sum of the opposite interior angles.
21. The sum of the interior angles of a triangle is equal to two right angles.
    Cor. 1. In a right triangle the acute angles are complementary.
    Cor. 2. If two angles of one triangle are equal respectively to two angles of another, the third angles are congruent.

22. If two angles of a triangle are equal, the triangle is isosceles.
23. If two angles of a triangle are unequal, the sides opposite are unequal; the greater side is opposite the greater angle.
24. Converse of 23.
25. A convex broken line is less than any other which envelops it and has the same extremities.
26. If a perpendicular and oblique lines be drawn from a point to a given line:
    I. Two oblique lines cutting off equal distances from the foot of the perpendicular are equal.
    II. Of two oblique lines the one which cuts off the greater distance from the foot of the perpendicular is greater.
27. The perpendicular is the shortest line that can be drawn from a point to a straight line.
28. Two equal lines drawn from a point in the perpendicular to a given line, cut off equal distances from the foot of the perpendicular.
29. Two unequal lines drawn from a point in the perpendicular to a given line, cut off unequal distances, the longer cutting off the greater distance.
30. The bisector of an angle is the locus of points equally distant from the sides.
31. Two parallelograms are equal when two sides and the included angle of the one are equal respectively to two sides and the included angle of the other.
32. The opposite sides of the parallelogram are equal, as are also the opposite angles.
33. A quadrilateral having two sides equal and parallel is a parallelogram.
34. A quadrilateral whose opposite sides are equal is a parallelogram.
35. The diagonals of a parallelogram bisect each other.
36. Two angles having their sides respectively parallel are equal or supplementary.
37. Problem: To determine the sum of the interior angles of a convex polygon.
38. Problem: To determine the sum of the exterior angles of a convex polygon.
39. Circles having equal radii are equal.
40. A circle is bisected by a diameter.
41. In the same circle or in equal circles, equal angles at the center intercept equal arcs on circumference.
42. Converse of 41.

43. In the same circle or in equal circles, equal cords are subtended by equal arcs.
44. Converse of 43.
45. In the same circle or in equal circles, the greater of two unequal arcs subtends the greater chord.
46. Converse of 45.
47. The diameter perpendicular to a chord bisects the chord and the two subtended arcs.
    Cor. The line joining the center of two intersecting circles bisects their common chord at right angles.
48. In the same circle or in equal circles, equal chords are equally distant from the center; and of two unequal chords, the shorter is farther from the center.
49. Converse of 48.
50. A tangent to a circle is perpendicular to the radius drawn to the point of contact.
    Cor. At a given point on a circle one and only one tangent can be drawn.
51. Converse of 50.
52. Parallel chords intercept equal arcs of a circle.
53. Through three non-collinear points one and only one circle can be drawn.
    Cor. A circle may be circumscribed about a triangle.
54. Problem: To find the greatest common measure of two commensurable lines.
55. The fundamental theorem of limits.
56. In the same circle or in equal circles, angles at the center have the same ratio as their intercepted arcs.
57. An inscribed angle is measured by one-half its intercepted arc.
    Cor. An angle inscribed in a semicircle is a right angle.
58. The angle formed by a tangent and a chord is measured by one-half the intercepted arc.
59. The angle formed by two intersecting chords is measured by the half sum of the intercepted arcs.
60. The angle formed by two secants intersecting without the circumference of a circle is measured by one-half the difference of the intercepted arcs.
61. The angle formed by a tangent and a secant is measured by one-half the difference of the intercepted arcs.
62. To bisect a given line segment.
63. At a given point in a line segment to erect a perpendicular.
64. From a given point to let fall a perpendicular to a given line.
65. Through a given point to draw a line parallel to a given line.

66–69. To construct a triangle given: (1), Two sides and the included angle; (2), one side and two angles; (3), three sides; (4), two sides and the angle opposite one of them.
70. To find the center of a circle passing through three given points.
71. To bisect a given arc.
72. To bisect a given angle.
73. To construct an angle equal to a given angle.
74. To draw a line parallel to a given line.
75. Through a given point to draw a tangent to a given circle.
76. To inscribe a circle in a given triangle.
77–82. The necessary theorems in the theory of proportion.
83. A parallel to the base of a triangle divides the other two sides proportionally.
84. Converse of 83.
85–87. Two triangles are similar: (1), When they are mutually equiangular; (2), When an angle of one is equal to the angle of the other and the sides including the equal angles are proportional; (3), When their sides are proportional.
    Cors. to 85. 1. Two triangles having two angles of one equal respectively to two angles of the other are similar.
    2. Two right triangles having an acute angle of one equal to an acute angle of the other are similar.
88. The ratio of the homologous altitudes of two similar triangles equals the ratio of similitude of the triangles.
89. If two polygons are composed of the same number of triangles similar each to each and similiarly placed, the polygons are similar.
90. Converse of 89.
91. The ratio of the perimeters of two similar polygons is equal to their ratio of similitude.
92. If a perpendicular be dropped from the vertex of the right angle of a right angled triangle to the hypotenuse;
    I. The triangles thus formed are similar to each other and to the whole triangle.
    II. The perpendicular is a mean proportional between the segments of the hypotenuse.
    III. Each side is a mean proportional between the hypotenuse and the segment adjacent to that side.
93. The Pythagorean theorem.
94. If two chords intersect within a circle their segments are reciprocally proportional.

95. If two secants intersect without a circle the whole secants and their external segments are reciprocally proportional.
96. If a secant and a tangent meet without a circle the tangent is a mean proportional between the external segment and the whole secant.
97. To divide a straight line into parts proportional to given straight line.
98. To find a fourth proportional to three given lines.
99. To find a third proportional to two given lines.
100. To find a mean proportional to two given lines.
101. Parallelograms having equal bases and equal altitudes are equivalent.
102. Two rectangles having equal bases are to each other as their altitudes.
103. Two rectangles are to each other as the products of their bases by their altitudes.
104–107. The theorems which give the areas of (1), the rectangle; (2), the parallelogram; (3), the triangle; (4), the trapazoid.

Cors. to 106. 1. Triangles having equal altitudes and equal bases are equivalent.

2. Triangles having equal altitudes are to each other as their bases; triangles having equal bases are to each other as their altitudes.

108. Similar triangles are to each other as the squares of their homologous sides.
109. Similar polygons are to each other as the squares of the homologous sides.
110. To construct a triangle equivalent to a given polygon.
111. To construct a square equivalent to a given parallelogram.
112. To construct a square whose area is equal to the sum of two or more given squares.
113. To construct a square whose area is equal to the difference of two given squares.
114. To find two straight lines having the same ratio as two given polygons.
115. If a circumference be divided into equal parts, the chords joining successive points of division form a regular inscribed polygon, and the tangents drawn at these points form a regular circumscribed polygon.
116. The tangents drawn at the middle points of the arcs subtended by the sides of a regular inscribed polygon, form a reguiar circumscribed polygon whose sides are parallel to the sides of the inscribed polygon, and whose vertices lie on the radii drawn to the vertices of the inscribed polygon.

117. A circle may be circumscribed about a regular polygon and a circle may be inscribed in a regular polygon.
118. Regular polygons of the same number of sides are similar.
Cor. The perimeters of two similar polygons have the same ratio as their radii or their apothems, and the areas the same ratio as the squares of their radii or their apothems.
119-121. When the number of sides of an inscribed polygon is increased indefinitely: (1), The apothem is a variable having the radius as its limit; (2), the perimeter is a variable with the circumference as its limit; (3), the area is a variable with the area of a circle as its limit.
122. Two circumferences have the same ratio as their radii, or as their diameters.
Cor. The ratio of the circumference to its diameter is constant and $C=\pi D$.
128. The areas of two circles have the same ratio as the squares of their radii or of their diameters.
124. The area of a circle is equal to one-half the product of the circumference by the radius.
Cor. The area of a circle equals πR^2.
125. To inscribe a square in a circle.
126. To inscribe a regular hexagon in a circle.
127. Given the sides of a regular inscribed and a similar circumscribed polygon, to compute the perimeters of the inscribed and circumscribed polygons of double the number of sides.
128. To compute an approximate value for π.

SOLID GEOMETRY.

1. A plane is determined, (1), by a straight line and a point without the line; (2), by two intersecting right lines; (3), by three non-collinear points; (4), by two parallel right lines.
2. The intersection of two planes is a straight line.
3. From a point without a plane one and only one perpendicular to the plane may be drawn; this perpendicular is the shortest line that can be drawn from the pointto the plane.
4. Through a given point one and only one perpendicular can be erected to a plane.

5. Equal oblique lines drawn from a point in a perpendicular cut off equal distances from the foot of the perpendicular; and of two unequal lines drawn from the point in the perpendicular, the greater cuts off the greater distance from the foot of the perpendicular.
6. A straight line perpendicular to two intersecting lines is perpendicular to their plane.
7. All the perpendiculars to a straight line at a point lie in a plane which is perpendicular to the line.
8. If from the foot of a perpendicular to a plane a straight line be drawn at right angles to any line of the plane, and the intersection with that line be joined to any point in the perpendicular, the line so drawn is perpendicular to the line of the plane.
9. If one of two parallel lines is perpendicular to a plane the other is also.
10. Two lines perpendicular to the same plane are parallel.
    Cor. Two straight lines both parallel to a third, are parallel to each other.
11. Planes perpendicular to the same straight lines are parallel.
    Cor. Through a point, one and only one plane can be drawn parallel to a given plane.
12. The intersections of two parallel planes with a third are parallel.
13. Two angles having their sides parallel are either equal or supplementary, and their planes are parallel.
    Cor. All plane angles of a dihedral angle are equal.
14. A dihedral angle is measured by its plane angle.
15. Every plane containing a line perpendicular to a plane is perpendicular to this plane.
16. If two planes are perpendicular, a line drawn in one perpendicular to their intersection is perpendicular to the other.
17. The intersection of two planes perpendicular to a third plane is perpendicular to the third plane.
18. Through a given straight line, one and only one plane perpendicular to a given plane can be drawn.
19. The projection of a straight line upon a plane is a straight line.
20. The angle which a line makes with its projection upon a plane is the least angle made by the line and any line of the plane.
21. A point in the bisector of a dihedral angle is equidistant from the faces of the dihedral angle.

Definitions of polyhedral angle, sphere, tangent line and tangent plane, great circle, spherical angle, and spherical triangle.

22. The section of a sphere by a plane is a circle.
    Cor. 1. The center of a great circle coincides with the center of the sphere.
    Cor. 2. The plane of a great circle bisects the sphere.
    Cor. 3. Two great circles bisect each other.
    Cor. 4. Through three points on a sphere but one circle may be drawn.
23. A plane perpendicular to a radius at its extremity is tangent to the sphere.
    Cor. All lines tangent to a sphere at a point lie in the plane tangent to the sphere at the point.
24. The angle between two arcs of great circles is equal to the angle of their planes and is measured by the arc of a great circle described from its vertex as pole and included between its sides.
25. The sum of two face angles of a trihedral angle is greater than the third.
    Cor. The sum of two sides of a spherical triangle is greater than the third.
26. Parallel plane sections of a prism are congruent.
27. The lateral area of a prism.
28. The criterion for the equality of two prisms.
29. An oblique prism is equal to a right prism having for its base and altitude a right section and an edge of the oblique prism.
30. Opposite faces of a parallelogram are congruent.
31. A plane embracing two opposite edges of a parallelopiped divides it into two equivalent triangular prisms.
32. A parallelopiped is equal in volume to a rectangular parallelopiped having an equal altitude and an equivalent base.
33. Two rectangular parallelopipeds having equal bases are to each other as their altitudes.
34. Two rectangular parallelopipeds having equal altitudes are to each other as the areas of their bases.
35. Any two rectangular parallelopipeds are to each other as the products of their three dimensions.
36. The volume of any rectangular parallelopiped.
    Cor. The volume of any parallelopiped.
37. The volume of a triangular prism.
    Cor. The volume of any prism.
38. If a pyramid be cut by a plane parallel to its base:
    I. The edges and the altitude are divided proportionally.
    II. The section is a polygon similar to the base.
    III. The area of the section is to the area of the base as the square of the distance from the vertex is to the altitude.

39. The lateral area of a regular pyramid.
    Cor. The lateral area of a frustum of a regular pyramid.
40. Triangular pyramids having equal altitudes and equivalent bases are equivalent.
41. A triangular pyramid is one-third of a triangular prism having the same base and altitude.
    Cor. 1. The volume of a triangular pyramid.
    Cor. 2. The volume of any pyramid.
    Cor. 3. The ratio of pyramids with equal altitudes.
42. Plane sections of a cylinder embracing an element are parallelograms.
43. The bases of a cylinder are congruent.
    Cor. Parallel sections of a cylinder are congruent.
44. The lateral area of a cylinder.
45. The volume of a cylinder.
46. The ratio of the surfaces and of the volumes of two similar right cylinders.
47. Plane section of a cone, containing one element, are triangles.
48. Any section of a circular cone parallel to the base, is a circle whose center lies upon the straight line joining the vertex to the center of the base.
49. The lateral area of a cone of revolution.
50. The volume of a cone.
51. The area of the convex surface of the frustum of a cone of revolution.
52. The ratio of the surfaces and of the volumes of two similar right cones.
53. All points in the circumference of a circle or sphere are equally distant from its poles.
    Cor. The polar distance of a great circle is a quadrant.
54. If the first of two spherical triangles is the polar of the second, the second is the polar of the first.
55. In two polar triangles each angle of one is measured by the supplement of the side lying opposite it in the other.
56. The sum of the angles of a spherical triangle is greater than two and less than six right angles,
57. The area of the surface generated by a straight line revolving about an axis in its plane.
58. The area of a zone of a sphere.
59. The area of the surface of a sphere.
    Cor. The ratio of the surfaces of two spheres.
60. The volume of a sphere.
    Cor. The ratio of the volumes of two spheres.

BOOKKEEPING.

In all or nearly all of the courses lately adopted, the time devoted to bookeeping has been increased from a term to a semester. Where arithmetic is followed with bookkeeping and the two together occupy a full year of work, no objection will be raised to alternating the subjects, thus concentrating attention upon bookkeeping, and such reviews of arithmetic as are necessary for a full year. Bookkeeping originally found a place on the course of study because of a demand for some practical instruction in the common affairs of business life.

The high schools of the state should keep faith with the people by devoting the best talent and teaching energy of the school to instruction in this subject when it is offered.

The value of bookkeeping as a high school study depends more largely than, perhaps, any other in the course upon the system used and the manner of treatment. Its low repute in the minds of many is due to the fact that they are thinking of the formal text-book work of earlier days, with its uniform memoranda and utter lack of anything in the nature of actual business transactions. Beyond a more or less vague idea of debit and credit, and some training in habits of arrangement, care, and neatness, it yielded little benefit, and was hardly worthy of more than a very few weeks' study.

With any one of several of the modern systems, however, the case is quite different. If treated properly, no other subject in the whole curriculum possesses a greater interest to the pupil, affords a wider range of training for practical application after leaving school, gives greater opportunity for the formation of habits of care, neatness, accuracy and the like, or aids the pupil more in determining his fitness for certain vocations in life. It is not mere surface work. It requires close, intensive business thinking which is of the highest training value.

Again, bookkeeping has an advantage over almost every other study in that it appeals so strongly to the business patrons of the schools. It popularizes the high school and overcomes the prejudices of so many in regard to some of the other branches.

The value of any special system may be said to be in direct ratio to the actual business conditions for which it provides, provided, of course, that these are within the comprehension of the pupil. It should call for transactions so varied that, while there may be a general similarity, no two books shall be alike. When such work is given, the pupil realizes as never before that his success depends upon his own individual

effort. His cash must equal the amount called for by his books, his trial balance must be correct, and he must be able to stand the test in regard to all phases of his business. If his books are not fairly well kept, not even the expert teacher can help him out of his difficulties, and he learns what it means to depend upon himself. The various forms of business paper, checks, drafts, leases, and some of the methods of business transactions assume a definite meaning which can only be given by daily use and experience. Topics of arithmetic, such as markings of goods, interest. discount and commission becomes real and tangible, and their connection with the world outside the covers of the book is comprehended. The importance of ability to do the fundamental operations is understood after hours have been spent in detecting some error in computation. A standing of 90 per cent. is not sufficient; the work must be correct or it is a failure.

The above will indicate the purposes to be kept in view in the study of bookkeeping in the high school. It is within the ability of the average second year student, and, if given at that time, will have its effect on the succeeding work. It requires a longer time, however, than the one term often given to it. A year for bookkeeping and the allied arithmetic is not too long. Not only are the transactions confusing at first and the intricacies of the double entry difficult, but time is needed for a gradual growth of the power to see relationships of the different entries and processes. But little, if anything, will be gained by using single entry as an introduction. The change makes the double entry more difficult than to introduce all parties to the transactions at once.

There should be a few weeks of introductory work with uniform memoranda in the old fashioned way. This will give opportunity to gain familiarity with forms of entry, and a knowledge of the necessary general principles of the subject before taking up the confusing details of the actual business.

HISTORY.

THE PURPOSE OF HISTORICAL INSTRUCTION IN SCHOOL.

The utility of history as a high school study is due chiefly to the training which it affords for citizenship. "To prepare the child for judgments in actual life the materials must resemble as nearly as possible the conditions of actual life. Such materials are found in history and found there in greater degree than in any other subject." Aside from the body of information acquired, the weighing of evidence, the comparative study of political systems of other countries, and the formation of judgments upon men and measures, constitute a most useful training for the future citizens. Dr. Arnold described the utility of instruction in history, civics, and economics when he said: "It is clear that in whatever it is our duty to act, those matters also it is our duty to study." In addition to the training which it affords to the judgment, history, constantly taught, also trains the perception, imagination and memory. The importance given to training the judgment should increase in the higher grades and the judgment can be best exercised when the pupil's perception, imagination, and memory supply the necessary data. It is hardly necessary to say that by the imagination, in this case, is meant the power to place one's self in the position of the people of other times and of other countries. For fuller discussion of the purpose of historical instruction see Bourne: Study of History and Civics; Report of the Committee of Seven; Hinsdale: How to Teach and Study History, ch. I–IV; Lecky: Political Value of History.

It should not be the ideal of history teaching to furnish a bare outline of names and dates, a well proportioned set of pigeonholes to be filled up in after life. Such a process, however attractive in theory, is not workable in fact; the names and dates come to have less than the value of algebraic symbols of unknown quantities. But it by no means follows that history

can be taught without accurate knowledge and careful memorization of the most significant historical landmarks. These are means to an end, and should be so illuminated with concrete detail as to be held as vital elements rather than as a bare and dead weight on the memory. Institutions and men should be made real for the student by sufficient concrete and intelligible discussion of their essential characteristics. As a part of the training in judgment, and in the interest of mental economy, they should be taught to observe lines of causation, to distinguish between the enduring and the fleeting, between the essentials and the non-essentials in history, and the important should be made clear, at whatever cost of time. To the objection that this mode of treating historical study as a training in judgment takes more time, the answer of the late Mary Sheldon Barnes is conclusive: "Good friend, it does; and it takes more time to solve a problem in arithmetic than to read its answer; and more time to read a play of Shakespeare than to read that Shakespeare was the greatest dramatist of all the ages; and more time finally to read the American constitution and the American newspaper, and make up your mind how to vote your own vote, than it does to be put into a 'block of five.' *But what is time for?*"

METHOD.

The following outline is probably inclusive of the various possible activities connected with the daily business of teaching history. A careful study of this outline, read in connection with the immediate business in hand, should prove helpful:

OUTLINE of the TEACHER'S DAILY BUSINESS in HISTORY TEACHING.

I. The Assignment.

a. Text book.
   Questions of fact.
   Questions of reasons, relation and opinion.
b. Note book work.
   1. To organize old material for thinking, relating.
   2. To store facts to be memorized.
c. Charts—for visualizing, localizing, in time and place.
   Purpose, to aid memory, and to assist pupils to grasp and to hold complex events.
d. The map, as in c.
e. Outside reading.
   1. Original sources.
   2. General reference work.
   3. Biography.
   4. Historical fiction.
f. Special topics for selected individuals, or sections of class.

II. The Recitation.

a. Review.
   Topical method.
   Question method.
b. Testing on assigned work for the day.
c. Free discussion by pupils.
d. Supplementary discussion and assignment by the teacher.

The following are some of the fundamental criticisms made on history teaching in general by inspectors of schools, and others who have observed the work in Wisconsin:

I. *The core of essential fact material which is found in a good text book is not thoroughly mastered*, for some or all of the following reasons:

(a) Because the assignment is not sufficiently specific to guide pupils to advanced work.
(b) Because the teacher does not keep clearly in mind that one of the uses of the chart and the maps is to definitely fix historical fact.
(c) Because pupils are not made to see the importance of the historical facts selected to be studied.
(d) Because the teacher has not definitely determined upon the relative value of the various historical facts which may be selected for study.
(e) Because the discussion of reasons and relations is thrust forward, before the facts, on which the discussion depends, are fixed by all members of the class.
(f) Because the topical method is employed too frequently and too early in the work.
(g) Because the assignment does not contain questions of reason, relation and opinion, to stimulate and direct thought and inquiry during the study period.
(h) Because the teacher neglects to test the student's memory of facts assigned, and invites free discussion, or volunteers a discussion herself before the facts, upon which the discussion must depend, are known by all.
(i) Because assignment of outside reading is made without sufficient reference to the core of essential fact found in the text book.
(j) Because assignment of special topics to selected individuals is made without reference to the core of essential fact, and because recitation upon special topics easily creates the illusion that the class understand the subject covered, when, in reality, it is blurred for all by a system of division of labor.

II. *Pupils do not learn to read history thoughtfully; neither do they learn to plan and direct their own study, that is to say, to grow steadily more and more self-reliant in the use of books*, for some or all of the following reasons:

(a) Because lessons are not assigned in a detailed and logical manner, and in such form that all will be able to recollect the assignment.
(b) Because they are not slowly but surely made conscious of the teacher's method of directing their work; that is to say, they are not led as they should be, to gradually assume responsibility for making the assignment themselves. If they

become conscious of the value of the teacher's question, of the help it renders them in study, then they will gradually acquire the power to ask questions of themselves when they study. They should be tested steadily for this power.

(c) Because for some of the reasons enumerated in number one they have never absolutely mastered the core of essential fact and because they have not learned that thinking rests back upon fact.

(d) Because they are permitted in the recitation to make random discussion of things, the elements of which are not known; because they are called upon in recitation to render judgment on things not previously analyzed or thought out during the study period; that is to say, because the assignment did not direct them to do thinking while they studied, they grew accustomed to rendering snap judgments in the recitation, or to accepting the snap judgments of their fellows.

(e) Because the teacher, before entering upon a discussion herself, does not review and test thoroughly the knowledge of the pupils. Occasionally the work of a history class is completely blurred because the teacher tells too much.

THE CURRICULUM.

The work in the high school should consist of the history of the United States (to be given in the last year, if possible) and one or more of the following blocks:

1. Ancient History (Oriental Greek, Roman and Early Medieval) to 800 A. D. One year.
2. Medieval and Modern History, 800–1900 A. D. One year.
3. Medieval, one-half year, and English History, one-half year.
4. English History. One year.

The topics to be treated in each "block" are discussed at length in Bourne's book and in volume by the Committee of the New England Association. In Bourne, too many topics are suggested if less than five periods a week are given to history. The teacher should remember that it is wiser to teach a few subjects in such a manner as to train the judgment, rather than to attempt to cover the field. The latter is an impossible task, and the value of the study will be best secured by selecting only the most important topics for careful study. In ancient history, for example, much attention should be given to the biographical side and to the civilization of the different ages, rather than to the dynasties of Egypt or the laws of early times. In medieval history the elements in the civilization which have influenced modern life and thought should be emphasized. In modern history the pupils should learn the more important features of the governmental systems in the chief European countries. They should be taught to contrast the federal systems in Germany and in the United States and

the party systems in France, England and this country. In English history the pupils should study the elements which have been important for the history of our own country.

REFERENCE BOOKS FOR TEACHERS.

Bourne: Teaching of History and Civics.—Longmans.
Practical Recommendations, with excellent bibliographies.

The Study of History in Schools. Report to the American Historical Association by the Committee of Seven. Macmillan. A very valuable discussion; should be studied by all history teachers.

Channing and Hart: Guide to the Study of American History. Ginn. Essential to every teacher of the history of the United States.

A report of the Committee of Six, on Practical Methods and Courses, to the New England Teachers' Association, submitting a plan of a syllabus for a four years' course in history. D. C. Heath & Co.

See High School Library lists for reference works for pupils.

CONSTITUTIONAL HISTORY OF THE UNITED STATES.

In the high school, the history of the United States should be taught with stress upon the political, constitutional and economic aspects, as a preparation for the exercise of citizenship. The emphasis should be laid upon the period following the Revolution. The survey of the confederation and the formation of the new constitution should make clear the difficulties which led to the compromises of the constitution, and the colonial and early state institutions should be sufficiently described to show how the new constitution derived its material from these earlier political institutions. In connection with the formation of the constitution the main features of the instrument should be studied, thus enabling the student to see the result of the work of the constitutional convention. The struggle between the systems of Jefferson and Hamilton in Washington's administration will serve to reveal the organization of national political parties, and the beginning of the long struggle between the strict and loose construction of the constitution. In connection with Hamilton's plans for the bank, funding, the tariff, the currency, etc., the fundamental ideas of political economy in respect to currency, finance and banking should be elucidated. Throughout the course this inter-relation of civics, economics, and American history should be preserved.

In cases where civics is taught as a separate study constant reference should be made to concrete historical examples in the civics class, and equally constant attention should be called to the economic and constitutional bearings of an event, in the class in history.

CONSTITUTION OF THE UNITED STATES.

Provision is made by statute for the teaching of the Constitution of the United States and of Wisconsin in the public schools.

A knowledge of the fundamental laws of the land is indispensable to every citizen, and with this end in view the constitution should be taught, the more important clauses being memorized. The error, however, should not be made of treating the subject in a meaningless, routine manner, for every section and every clause possesses a life which more or less affects our every-day existence. Let the teacher make the branch a practical one, losing no opportunity of bringing out its full meaning by the application of current history or local events. In this way an interest will be excited, and more than all, the great object in teaching of civil government will be more nearly attained, viz., to create law-abiding citizens. The young people must early learn the duties of the citizen and the individual responsibility of that citizen toward maintaining a stable government for the nation.

CONSTITUTION OF WISCONSIN.

The Constitution of Wisconsin should be treated in its analogies to the national constitution, at the time of consideration of the leading topics of that branch. It will therefore not be necessary to spend much time in a special study of the Wisconsin constitution. In general, the two are much alike. The principal study should be put upon the important parts of the state constitution not already considered in connection with the constitution of the United States. Omit unimportant facts. It will be well to deal with the different forms of governments, as administered in the county, town, village, city and school districts. These governments come within the immediate knowledge of the children or their parents, and a study of details will be found profitable. It will be well also to take up the subject of elections. The present system of voting, known as the "Australian" method, may be illustrated by securing samples of the ballot. The method of nominations through primary elections is important.

If there is a literary society in connection with the school, much assistance can be given to the subject of civil government by providing for debates upon important national questions, for moot courts, and mock legislative deliberations. Every opportunity to visit the state legislature, the county board of supervisors, the town meeting, and other assemblages of governmental character, should be improved. Throughout the entire work on this subject an attempt should be made to have pupils realize the essentials of good citizenship. A knowledge of constitutions and of the details of governmental activities may make more intelligent citizens, but it does not necessarily make better ones.

ECONOMICS.

A high school course in economics should be made the essential part of the training for citizenship by giving pupils a definite understanding of the leading facts and principles which underlie the present social order, by inculcating habits of independent investigation and clear reasoning with respect to the facts entering into such investigations, by cultivating that attitude of mind which will always be tolerant without sacrificing personal convictions, and, in general, by introducing pupils to the great problems which affect the industrial world, without prejudice and without dogmatism.

In schools where only a half year is devoted to this study one of two lines of work may be pursued; where economics runs through a whole year, both lines of work may be attempted. It is doubtful whether both can be made a success if together they occupy only half of one year.

One line of work embraces a study of industrial history. Beginning with the family methods of production, the growth of the present industrial order may be traced through the guild, domestic and factory system, to the present system of combination. Material for the first three stages of industrial evolution must be drawn chiefly from European sources, while for the last two,—the factory and combination or consolidation systems,—American history abounds in illustrations. The causes which produced successive stages of industry should be analyzed and the relation of each system to its contemporary social order pointed out. Pupils will thus gradually learn to realize that our industrial, social, political and other institutions differ with time, circumstance and place.

The other line of work involves a study of the production, exchange, distribution and consumption of wealth. Pupils should gain definite conceptions of terms like production, capi-

tal, labor, value, interest, etc. Special care should be taken not to leave pupils with the impression that great world-wide problems can be expressed and solved in dogmatic definitions. Nowhere is a largeness of view and open-mindedness more essential than here. The United States census and other statistical works afford ample illustrative material by means of which class discussions can be made concrete. The publications of the state and federal departments of labor and many other government publications can be used with profit. Roscher's statement that the point of departure, as well as the aim of economic science, is man, should not be forgotten. The final test of economic life is human welfare.

Useful text and reference books can be secured for both lines of work, and neither can or should completely exclude the other.

GERMAN AND LATIN.

In teaching the foreign languages in the high school, the teacher should never lose sight of their value as a means of giving a thorough training in the use of English. In fact this value in itself is a strong justification for their place in the high school course, and for this purpose they are among the most practical of all the studies.

This training is along three lines:

1st. In giving ability to get the exact thought from the printed page; in other words, in learning to read. Under the instruction of a capable teacher the pupil can be held to a definiteness and exactness in this respect, closely approximating that which the professional man must reach in mastering his difficult reading.

When this close work is attempted with the familiar English, it is difficult to prevent the substitution of mere superficial reading, giving a vague comprehension of a few of the more prominent ideas, for the intensive study necessary to understand the foreign language. Teachers, too, are often inclined to accept this slipshod work in English when they would not think of doing so in German or Latin.

2nd. In enlarging the pupil's vocabulary through the selection of the proper English word to fit the thought. This affords an excellent opportunity for a close study of the meaning of words and may be made more profitable than the formal word analysis so often taken.

3rd. In training in the mechanics of English expression. The translation of what is to the pupil a confused and unnatural arrangement of ideas into clear readable English is the test by which the teacher may know how thoroughly the thought has

been mastered by the pupil. The absurd and ridiculous hodge-podge of words so often allowed to pass as translations cannot be too strongly condemned. Not only is the disciplinary value of the study almost wholly lost, but the effect upon the pupil's English must be distinctly bad in every way except in so far as the translation is an example of what is to be avoided. The translation should be criticised and worked over until it becomes good, idiomatic English. When pupils understand that this is to be always demanded, they will prepare for it and there will be growth accordingly. There should be considerable written translation. An excellent exercise is to write a translation upon the board and have the class criticise it until it is satisfactory. In this way the laws of English composition, grammar. and rhetoric may be practically applied. Of course all this will take time, but results can be reached which will amply justify the extra time and effort. The added power which will come from the thorough work will probably make up for the loss, and the teacher may find the class easily completing the usual amount. In any case, the great object should be quality of work; and good English should always be the outcome of the study of the foreign language. By insisting on this the other great benefits usually ascribed to such study will be realized in the fullest measure.

GERMAN.

It should be continually borne in mind by the teacher that German, as every other subject, should be taught in the interest of sound results and not merely in the interest of the most expeditious preparation for college. The colloquial side of this subject has been much neglected in high schools, and the aim of teachers should be to secure, by the end of the second year, not only a ready reading of easy German texts but also a fair ability to understand easy German when spoken and to carry on a very simple conversation based upon the ordinary occurrences of daily life or upon the texts set for translation.

The following outline of a course of study is largely based upon the report of the Committee of Twelve of the Modern Language Associations of America, which may be found in the proceedings of the National Educational Association for 1889, page 732 ff. Neatly bound copies of the report can be procured, at the price of sixteen cents, from D. C. Heath & Co., Boston. Teachers are strongly advised to secure a copy of this report.

The "elementary," "intermediate," and "advanced" courses outlined in the Report correspond approximately to high school courses of two, three or four years, respectively.

THE ELEMENTARY COURSE IN GERMAN.

A. *The aim of the instruction.* At the end of the elementary course in German, i. e., at the end of the second year's work, the pupil should be able to pronounce and translate at sight (into good idiomatic English) simple German prose, help being given on unusual words and constructions, to prove his knowledge of elementary grammar by putting easy English sentences into German, and to carry on a very simple conversation in German.

B. *The work to be done.*

First Year.

During the first year the work should comprise: (1) careful drill upon pronunciation; (2) drill upon the rudiments of grammar, that is, upon the inflection of the articles, of such nouns as belong to the language of everyday life, of adjectives, pronouns, weak verbs, and the more usual strong verbs; also upon the use of the more common prepositions, the simple uses of the modal auxiliaries and the elementary rules of syntax and word order; (3) the memorizing and frequent repetition of easy colloquial sentences, and short suitable poems; (4) abundant easy exercises designed not only to fix in mind the forms and principles of grammar, but also to cultivate readiness in the reproduction of natural forms of expression; (5) the reading of from 75 to 100 pages of graduated texts from an introductory reader, with constant practice in translating into German easy variations upon sentences selected from the reading lesson (the teacher giving the English), and in the reproduction from memory of sentences previously read.

Second Year.

During the second year the work should comprise: (1) the pronouncing and translating of from 150 to 200 pages of literature in the form of easy stories and plays; (2) accompanying practice, as before, in the translation into German of easy variations upon the matter read, and also in the off-hand reproduction, sometimes orally and sometimes in writing, of the substances of short and easy selected passages; (3) continued drill upon the rudiments of the grammar, directed to the ends of enabling the pupil, first, to use his knowledge with facility in the formation of sentences, and second, to state his knowledge

correctly in the technical language of grammar; (4) daily conversation from five to ten minutes on suitable passages selected from the reading lessons:

THE INTERMEDIATE COURSE IN GERMAN.

In addition to the work outlined for the two years of the elementary course, students during the *third year* should read from 300 to 480 pages of moderately difficult prose and poetry, with constant practice both oral and written, upon portions of the texts read. Of the latter, about one-half should be taken from modern prose, and the other half from poetry and the easier plays of Schiller, Goethe or Lessing. The work in grammar, accompanied by exercises in composition, should include the less usual strong verbs, the more idiomatic uses of prepositions, conjunctions, and modal particles, and the essentials of syntax and word formation. In this year the teacher should make a systematic effort to use German in the class room for all exercises suitable for such treatment.

THE ADVANCED COURSE IN GERMAN.

The work of the fourth year should comprise the reading of from 400 to 500 pages of standard literature in prose and poetry, with reference reading in the history of German literature, especially upon the lives and works of the authors studied. Students should write numerous short themes upon assigned subjects, mostly relating to the text read. With exception of the periods devoted to grammar and composition, the work of the class room should be conducted in German and students should be required to answer in that language the questions asked by the teacher.

SUGGESTIONS.

(1) *Pronunciation.*

The first matter of importance for the beginner is the acquisition of a reasonably accurate pronunciation. Daily drill upon the subject should be kept up inexorably until right habits are fixed. It is far easier to learn right than to unlearn the wrong. In all oral practice, i. e., in all exercises in which the student has to pronounce German words, correct pronunciation should be insisted on. The teacher will find a careful treatment of pronunciation in Thomas's German Grammar

(Henry Holt & Co., N. Y.), in Victor's German Pronunciation (Lemcke & Buechner, N. Y.), and in Hempl's German Orthography and Phonology (Ginn & Co., Boston.)

(2) *Grammar.*

As the present tendency in modern language teaching is a wholesome reaction against the former excessive emphasis on purely theoretical grammar, the teacher should beware of falling into the opposite mistake of trying to build up a sound knowledge of a foreign language without grammar. Although the study of grammar is not an end in itself, it is a most important means to the right end, and during the elementary course, especially during the first year, there should be constant and careful drill in the principles of elementary grammar. Much repetition will be needed, even though at times it may become tedious; for the time spent upon a thorough drill in elementary grammar will greatly facilitate satisfactory subsequent progress in reading and speaking. Especially students who do not study a classical language should receive a thorough grammatical training in their study of German.

The following points should be observed: (a) A small amount of elementary grammar thoroughly mastered is far more valuable than a large amount of more advanced grammar superficially acquired. All the grammar needed may be found in the "first parts" of the larger grammars, or in a good introductory book. (b) Whatever is regular and of common occurrence is far more important than the rare and unusual. Elementary students should not be burdened with long lists of exceptions or with rules for which they have no practical use. (c) The teacher's maxim should be: Little theory and much application. The work in grammar should be made as practical as possible. Glib reciting of rules and paradigms should never be accepted as a substitute for the actual use of the forms in short phrases and easy sentences. Most of the grammar drill should be in the form of oral elementary composition.

(3) *Memorizing.*

The proper starting point in teaching a modern language is the familiar language of everyday life. The student must begin to feel at home in it before he can begin to appreciate literary and poetic forms of expression. For creating this Sprachgefühl, one of the best kinds of drill is the memorizing and frequent repetition of easy colloquial sentences. Such sentences, taken from some phrase book or carefully selected from suitable texts, can be dictated to the students. The drill on them can either take the form of a dialogue, the teacher asking questions in German, or the teacher can give the thought

in English and call for a translation. The customary memorizing of poems is less useful in this regard as poetry often contains rare and archaic expressions. Its value in other directions, however, is sufficiently great to warrant its continuance, provided that the poems are carefully chosen, with reference to simplicity and naturalness of their language. During the intermediate and advanced courses the memorizing of poetry can be used to good advantage. The first year's work does not call for many poems.

(4) *Reading.*

Aside from the German-English exercises and anecdotes of the grammar, the reading matter of the first year should be in a very elementary reader, as Guerber's "Märchen und Erzählungen," or Seligmann's "Altes und Neues." During the second year one of the larger readers may be taken up, or special editions of good stories and plays can be used. One or two of these should be provided with exercises based on the text. For suitable reading material for the second year, as well as for the third and fourth years, see pp. 63–4, 71, and 73 of the Report.

Very easy parts of each lesson need not be translated in class, and especially in the intermediate and advanced course translation should be confined to test passages here and there in the lesson to gain time for oral work. But students should then always be given an opportunity to ask questions on the parts of the lesson left untranslated. The less routine translation is done in class, the more possible is it to insist *on a really careful* and idiomatic rendering of the parts chosen for translation. Valuable time can also be saved in the more advanced years by assigning some relatively easy text for additional outside reading, testing the amounts assigned by occasional short written examinations. In this way, shorter lessons can be assigned for the daily recitations and be treated more thoroughly. To show what a really good translation means, and to cultivate the pupil's literary sense, a passage of the German text should occasionally be given out for a carefully prepared written translation, with instructions to make the work just as good as possible. Such translations should then be criticised by the teacher and compared with one another in the class. Attention should then be called to the more delicate points of idiom, choice of words, word order, etc.

A short and carefully chosen passage of each reading lesson should be assigned for "intensive study." The student should be required to practice pronunciation on this passage especially, to memorize all the words and idioms in it, to learn the principal parts of all the nouns and verbs, to look up all the gram-

mar rules involved, to be so familiar with it generally, as to be able to give its contents either verbatim or in his own language. This passage will then form a very good basis for conversational drill.

(5) *Oral drill.*

As the course progresses, the student should be given more and more opportunity for hearing and speaking the foreign language. This refers by no means merely to conversation in the ordinary sense of the word. The latter should certainly not be emphasized unless the teacher has a fairly good practical command of the language. But dictation, oral composition, free retranslation of parts of the texts read, recitation of memorized or prepared work, expressive reading of certain passages by the teacher and other similar exercises can also be used to good advantage in training the student in readiness to understand and express himself in the foreign tongue. In all of these exercises, to make them really valuable, careful pronunciation and grammatical correctness must be rigorously insisted upon. Oral work, when thoroughly done, is of the greatest value; when superficially treated, it is likely to become worse than useless. No part of the work calls for greater vigilance and alertness on the part of the teacher who desires to gain the best results.

(6) *Books for Reference.*

The Teaching of German in Secondary Schools—Elijah W. Bagster—Collins. Macmillan Co. N. Y.

Methods of Teaching Modern Languages (by thirteen different authors). D. C. Heath & Co., Boston. 90 cents.

Bahlsen: New Method of Teaching Modern Languages. Translated by Dr. M. B. Evans. Teachers' College Record, Vol. 4, No. 3. 30 cts.

Bruel: The Teaching of Modern Foreign Languages in our Secondary Schools. Cambridge (England), 1898- 50 cts.

Rippmann: Elements of Phonetics. English, French and German. Translated and adapted from Prof. Victor's "Kleine Phonetik." London, Dent & Co. $1.00.

Grandgent: German and English sounds. Boston. Ginn & Co. 50 cts.

Francke: History of German Literature. N. Y. Holt & Co. $2.00. (Does not extend much beyond Goethe's death.)

Robertson: History of German Literature. N. Y. Putnam's Sons. $3.50. (Has an adequate treatment of 19th century literature.)

Hosmer: A Short History of German Literature. St. Louis. G. I. Jones & Co. $2.00.

A fuller list of reference books has been prepared by the German department of the State University and can be had by applying to the Secretary of the University or any member of the German department.

LATIN.

COURSE OF STUDY.

First year.—Latin lessons, accompanied from an early stage by the reading of simple selections. From twenty to thirty pages of an easy, consecutive text should be completed by good classes. Selections from Nepos, Viri Romae, or Eutropius may be used. In all written exercises the long vowels should be marked, and in all oral exercises pains should be taken to make the pronunciation conform to the quantities. The student should be taught to read the Latin aloud with intelligent expression. Sanity in First Year Latin—by H. W. Johnson —Classics Journal, vol. I, No. 3, February, 1906.

Second year.—Selections from Caesar's Gallic War equivalent in amount to four books. Selections from other prose writers such as Nepos, may be taken as a substitute for the Caesar. The equivalent of at least one period a week should be devoted to grammar, syntax, and prose composition. Reading aloud and translating, both prepared and unprepared passages, should be made a part of the work. A little pamphlet by H. W. Johnston, entitled, "Second Year Latin," published and furnished gratis by Scott, Foresman & Co., should be read by all teachers of Caesar.

Third Year.—Six orations of Cicero. Selections from the letters may be substituted for two orations. The equivalent of at least one period a week should be devoted to grammar, syntax, and prose composition. Special attention should be given to the translation into English, and to the study of Cicero's life and personality.

Fourth Year. Six books of Virgil's Aeneid. The student should acquire the ability to read metrically hexameters at sight. The equivalent of at least one-half period a week should be given to the study of mythology. Gayley's Classic myths in English Literature is very helpful.

The foregoing course represents the minimum amount of Latin to be read in four years. Many an ambitious teacher will do at least from one-third to one-half more than this amount. During the first and second years many easy selections should be read. This plan will not only enlarge and fix

the vocabulary but it will add greatly to the pupil's enjoyment and give him increased facility in translation. In the last months of each year, when the pupil has acquired considerable facility in translating the author of that year, much rapid reading can be done. Caesar may be used for sight reading in the third and Cicero in the fourth year.

SUGGESTIONS TO TEACHERS.

Pronunciation.—The Roman method of pronunciation should be used. Peck's, The Roman pronunciation of Latin, Henry Holt & Co., will be useful to teachers. In pronouncing proper names in translation the English pronunciation should be used. Otherwise the systems used by the history and Latin students will be at variance. The pronouncing vocabulary and rules given in the appendix to Webster's International Dictionary will serve as a guide.

Vocabulary.—The acquisition of a good vocabulary necessarily demands much of the student's time. While the learning of new words and attention to word study is of the utmost importance and should receive attention daily, it is largely by much reading that the vocabulary is kept fresh and increased. Ambitious and thoughtful teachers will strive, in every way possible, to increase the amount of Latin which the pupils read daily. This can be done by reading rapidly several pages in review, by translating at sight in advance, and by requiring pupils to give the substance of selections which have been assigned for outside reading. In the earlier stages of the study of an author the teacher and the pupil should frequently work together, the teacher leading the way and opening up the advance lesson, sometimes merely rapidly translating. See Prof. Friedrich Paulsen's article in the educational Review, November, 1899, on Changes in Latin Teaching in Germany, for a description of this method of teaching languages.

Grammar and Syntax.—The necessity of a thorough acquaintance with the forms of the language is so obvious that it will seem superfluous to call attention to it here. Yet the fact is that no part of Latin preparation is more defective than this. The forms as contained in the lesson book or as referred to in the grammar must be mastered absolutely. Well-directed memorizing, followed by written exercises, dictation, oral practice and frequent reviews, ought to produce good results. There should be definite and systematic grammar and syntax lessons throughout the four years, the topics being selected ac-

cording to the needs of the pupils and the text read. This work and the practice in composition should be done largely in the fall and winter months.

Composition.—The purpose of this study as pursued in the high school, is not to make pupils skillful in writing Latin, but to enable them by use to make the forms and syntax of the language more completely their own. The composition of a single Latin sentence, illustrating certain constructions or idioms of the language, will do more to impress these upon the mind of the pupil than half a dozen parsing exercises involving the same points. Latin composition may be pursued by devoting one or more exercises of each week exclusively to this work; or, by means of daily exercises based upon limited portions of the Latin read in class. Many teachers believe that it is well to supplement the practice in connected-discourse-composition based on Caesar and Cicero, with lessons in which the sentences are selected with reference to illustrating some important principle in grammar or syntax.

Preparation for Caesar.—A good class with a good teacher ought to finish a lesson-book in time to do some work preparatory to Caesar in the first year; for in most cases the transition from an elementary book to Caesar is too abrupt. If Caesar is to be read immediately, the teacher must exercise great diligence in anticipating the difficulties of the advance lesson and striving by every means to make smooth the somewhat uneven path. Extracts from Roman history, Fabulae Faciles, Viri Romae and extracts from Eutropius have been used as a preparation for Caesar with good results.

Translation.—An exact and idiomatic rendering into English of the thought of a difficult Latin sentence is perhaps the chief visible result of Latin instruction, and teachers who are not working to secure that end have in a measure lost sight of the goal. Literal translations are often indispensable by way of explanation and for purpose of illustration, but if they are not at the same time idiomatic, they should always be accompanied by idiomatic renderings. "Translation English" is not only painful to hear but it destroys the linguistic sensibility which all instruction should foster and gives most grotesque conceptions of Roman literature.

Not only should good English be insisted on always, but some effort varying with the maturity of the class or of the individual pupil, should be made to produce the style of the author translated. The succession of Latin authors read in school is all that could be desired in this regard. The straightforward

narrative style of Caesar may be reproduced without difficulty by pupils who have not read much in English. In connection with Cicero, translations may be improved and made more spirited by bringing out some characteristics of oratorical English, with examples from speeches of American orators. Milton and Spenser studied in the high school ought to contribute to better translations in Virgil.

Roman life, literature and history.—The Latin authors read in the high school afford a considerable field for the study of literary form and historical events. This should not be neglected. For example, in Cicero the pupil should be required to analyze the argument of the speeches read and thus to obtain some conception of the form of an ancient oration. It is a good plan to call upon some member of the class each day to give orally a synopsis of the review or advance lesson, and at the conclusion of any work the argument should be carefully read, so that each pupil should carry away a definite idea of the work as a whole, both in respect to form and content. Every high school library should be provided with a copy of Ward's Fowler's (G. P. Putnam's Sons) Caesar, Strachan—Davidson's Cicero and Sellar's Virgil (G. P. Putnam's Sons)—the last perhaps more especially for the teacher. By judicious reference to them much can be done to stimulate and maintain a living interest in the men whose works are read. Many topics relating to Roman life may be worked up by the pupils and presented to the class in such a way as to increase the interest in Latin.

JOURNALS, MAPS, ATLASES, AND REFERENCE BOOKS.

Journals.—Teachers of Latin should subscribe for one or two good periodicals like the Classical Journal and the School Review.

Maps and Atlases.—Good wall maps of the Roman Empire and the Italian peninsula are needed in every school for the classes in Ancient History and Latin. Kiepert's maps (Rand, McNally & Co.) are excellent in every way. Johnston's maps are less expensive but very serviceable.

A classical atlas should be upon every reference table. The best are Kiepert's (Benj. H. Sanborn & Co.), Ginn & Co.'s Classical Atlas, and Benj. H. Sanborn's Classical Atlas.

Books for teachers.—The following books relate more particularly to methods of teaching Latin:

Bennett, C. E., and Bristol, Geo. P., The Teaching of Latin and Greek in the Secondary School; Longmans, Green & Co.

Hale, W. G., Aims and Methods of Classical Study; Ginn & Co.
Hale, W. G., The Art of Reading Latin; Ginn & Co.
Lodge, Gonzales, Helps for the Teaching of Caesar; Teacher's College Record, Columbia University.
Tolman, H. C., The Art of Translating; B. H. Sanborn & Co.

Reference books.—The following books are indispensable where Latin is taught. Histories of Rome are not included in this list:

Becker, W. A., Gallus: or Roman Scenes of the Times of Augustus; Longmans, Green & Co.
Church, Alfred J., Roman Life in the Days of Cicero; Dodd, Mead & Co.
Forsythe, William, Life of Cicero; Scribner's Sons.
Froude, J. A., Caesar: A Sketch; Scribner's Sons.
Fowler, H. A., A History of Roman Literature; D. Appleton & Co.
Gayley, C. M., Classic Myths in English Literature; Ginn & Co.
Gow, J., A Companion to School Classics; The Macmillan Co.
Harper's Dictionary of Classical Literature and Antiquities; American Book Co.
Harper's Latin Dictionary, Edition of 1895; American Book Co.
Johnston, H. W., The Private Life of the Romans; Scott, Foresman & Co.
Judson, H. P., Caesar's Army; Ginn & Co.
Nettleship, Henry, Virgil; D. Appleton & Co.
Sellar, W. Y., The Roman Poets of the Augustan Age: Virgil; The Macmillan Co.
Shumway, E. L., A Day in Ancient Rome; D. C. Heath & Co.
Strachan, Davidson—Cicero; Warde Fowler, Caesar; G. P. Putnam's Sons.
Trollope, Anthony, The Life of Cicero; Harper & Brothers.

GREEK.

The suggestions here made with regard to the study of Greek in high schools are all to be found in the Report on College Entrance Requirements made to the National Educational Association, 1899.

The first principles should be learned from some good beginner's book. * * * It cannot be said too plainly that a thorough knowledge of forms is absolutely necessary not only for entrance to college, but as a basis of any accurate reading. The Greek grammar must be carefully and constantly and persistently studied. Special emphasis must be put upon the

mastery of forms, which are to be repeatedly written as well as said; the elements of syntax are necessary, but will not seem difficult after some study of Latin.

From the beginning systematic instruction in writing Greek sentences should be given, and this should continue throughout the preparatory course, as auxiliary to and indeed a part of grammatical study. Its main object is to train the pupil to read Greek readily and accurately. In the hands of a skillful teacher the most efficient means of teaching connected discourse is turning back into Greek passages of Attic prose that have been translated by the pupil. If the teacher cannot find time always for this, text books embodying this idea can be had from several of the publishers of Greek books.

The practice of reading Greek aloud with intelligent expression and careful attention to the quantity of syllables must be insisted upon. This should be a part of every recitation, just as translation, that the pupil may be taught to appreciate the beauty of form and sound and to feel the rhythm of the sentence. Metrical reading should commence as soon as Homer is begun.

Sight reading, or the reading of unprepared passages of easy Greek, is an exercise which should be early begun and continued throughout the course. This may be so managed as to enliven a part of every recitation and at the same time to quicken the pupil's confidence in his own knowledge and skill.

What has been said in the Latin section about translation applies quite as much to the Greek. Really good translation, accurate and idiomatic, is not simply an intellectual feat and of great disciplinary value; under the direction of a skillful teacher translation from Latin and Greek contributes as perhaps nothing else can to the mastery of style in English.

The teacher should insist that the Classical Atlas (e. g. Kiepert's) be constantly used, and no question that is important in history or antiquities or social life or mythology should be left unexplained. Gulick's *Life of the Ancient Greeks* (Appleton's) or Gayley's *Classic Myths* (Ginn & Co.) are not only serviceable but interesting.

It is practically universally agreed that Zenophon and Homer are the Greek to be read in the high school. (The amount required is four books of the Anabasis and three of the Iliad or four of the Odyssey.) Text books in these authors, for high school pupils, are provided with vocabularies.

Course of Study Recommended in Greek.

First Year.

First and second terms: Introductory lessons.
Third term: Xenophon's Anabasis (20 to 30 pages).
Practice in reading at sight and in writing Greek.
Systematic study of grammar begun.

Second Year.

Zenophon's Anabasis (continued), either alone or with other Attic prose (75 to 120 pages).
Practice in reading at sight, systematic study of grammar, thorough grammatical review, and practice in writing Greek, based on study of Books I and II of the Anabasis.

Third Year.

Homer's Iliad i–iii (omitting ii, 494–2nd), or Odyssey i–iv.
Attic prose (30 to 40 pages) with practice in writing Greek; grammar; practice in reading at sight.

Note: If only two years can be given to preparatory work in Greek, at least one book of the Anabasis, better two, should be read the first year. The remainder of the Anabasis and the Homer may then be read in the second year; but this will require some extra time and very steady work.

ENGLISH.

There are three great purposes in the work in English in the high school:

1. To give the pupil ability to think clearly to the end of a topic and to express his thought in clear, concise and correct oral and written language.
2. To train him so that he can understand what he hears and reads.
3. To give him an appreciation of literature.

The first two of these purposes should not be confined to the exercise of English proper, but should be distinctly kept in mind in every recitation. Clear, correct expression is a test of clear understanding of any subject. While it may perhaps not always follow that a pupil does not understand an idea because he cannot express it, it is almost certain that he has a fairly good comprehension of it if he can state it well in his own language. The work in the different mathematical studies, for instance, which give such an abundant opportunity for thought, would be greatly strengthened if more attention were given to the exact expression. The same fact is in a great measure true of the other studies of the course. The teacher should never lose sight of the form of even the short recitation, while the topical recitations now so commonly required, supply excellent opportunity for more extended oral composition.

COMPOSITION AND RHETORIC.

Little aid can be given in the matter of method of teaching composition. In no work in the high school are the tact and ability of the teacher more clearly shown than in the interest and results obtained in this study. A few fundamental facts and principles should, however, be kept in mind.

First. The aim as stated above should be to give ability to the pupil to express his own thought in clear, concise and correct language.

Second. That if the work is to be effective, the pupil must be interested in what he is writing; pupils as a rule like to express that which they understand and in which they are interested.

Formal exercises, written according to a mechanical standard, are likely to be distasteful, irksome, and productive of little good. Topics relating to the pupil's interest outside of school and to his everyday work in the school (his present business), should be used to a much greater extent than they usually are. History and the different studies in science have in them very valuable material which will aid both in composition and in the studies themselves. Physics, taken as it generally is, in the last year of the high school, lends itself especially well to this use. Topics such as a steam engine, compound microscope, pumps, capillarity, inclined plane, and many others, treated fully from their fundamental principles, afford material for long or short compositions requiring a definite, logical outline. These will appeal to the student as being closely connected with his daily work so that he looks upon them as very practical and useful. The preparation of para-

graph and theme outlines of the daily lessons in such subjects as admit of this treatment, is a very valuable exercise in composition, and at the same time gives definite training in ability to study in a systematic and intelligent way.

Third. Rules and forms of rhetoric according to which compositions must be written should not be given. The expression of the pupil should be that which is natural to him, and if it is not rhetorical it should become so as a result of growth through reading the works of masters and the study of their characteristics. The discriminations of the kinds of discourse into narrative, expository, and descriptive, should not be made the test of his composition, especially in the first years of the course. The formal study of rhetoric by means of lessons assigned from a text-book day after day is of very doubtful value; the principles of the subject should be taught inductively, in connection with the reading and composition.

A text-book in grammar and one in composition and rhetoric should be in the hands of the pupil for reference and occasional assigned lessons throughout the course. About one-half the time of the work in English in the first and second years should be given to composition, and about one-fifth in the third and fourth. All written work should be promptly and carefully examined by the teacher, and errors indicated by some system of signs which shall leave the pupil to make his own correction. Criticisms made in conference with the pupil are, perhaps, the most effective of all. The longer themes written by the pupils should be filed by the teacher in some systematic way so that they may afterward be referred to in case it is desirable to do so for any purpose. At stated times these may be returned.

READING OF MASTERPIECES.

The most common criticism on high school work made, not only by authorities in higher schools but by the general public, is that the pupils are not able to read. The idea is too common with teachers of English that the close, intensive study necessary to comprehend the thought of a difficult passage is likely to detract from the interest necessary to secure the proper appreciation as a piece of literature. While there is a measure of truth in this, especially if the teacher has not a full appreciation of the proper relations of the different purposes of the study of English in the high school, yet the danger is much greater in the opposite direction, that the interest aroused is merely theatrical, superficial, and really weakening in effect. Far too many of the questions asked are not such as will call

out real study and thought on the part of the average high school pupil; they are too general and require too great maturity for their answers; in other words, they are college questions. Questions for high school pupils should be very specific and within the ability of the class.

The first duty of the high school is the very practical one of training the pupil to read. Teachers of English may well learn from the teachers of Latin in this respect. The greatest practical value of Latin in the high school lies in the fact that it gives a training in the power to read closely, and to express clearly the thought of what is read. The capable teacher questions closely, applies grammatical principles, and uses all possible means to compel the pupil to get the exact thought of the author. The final test comes in the correct, readable translation.

In English as in Latin the material for this training must be the matter read. This should be of so difficult a nature as to require close study to get the thought. Some selections recommended for high school reading, give little opportunity for this intensive study; their construction and meaning are perfectly clear. Such have their place in the course, but their value lies in other directions. Others are nearly as difficult as Latin itself. Not only should the thought of the selection be mastered, but this mastering should be done in so systematic a way that power is given to apply to fresh difficulties. This study should give the ability clearly to express the thought by oral reading.

The following list of books contains nearly all of the masterpieces commonly approved for use in literary readings. The figures set opposite indicate the year or years of the high school course in which they are commonly offered:

Addison—Spectator Papers, 2.
Sir Roger de Coverly, 2.
Arnold—Sohrab and Rustum, 2.
Bacon—Essays, 3.
Burke—On Conciliation, 3-4.
Burns—Cotter's Saturday Night, 2-3.
Carlyle—Essay on Burns, 4.
Heroes and hero worship, 4.
Chaucer—Prolog. Knight's Tale, 4.
Coleridge—Ancient Mariner, 3-4.
Cooper—Last of the Mohicans, 1.
Dickens—Tale of Two Cities (outside), 4.
David Copperfield (outside), 3.
Christmas Carol, 1.
Eliot, George—Silas Marner, 1-4.
Emerson—Lincoln, 3.
American Scholar, 4.
Self Reliance, 4.
Compensation, 4.
Fortunes of the Republic, 3,

Franklin—Autobiography (outside), 1-4.
Goldsmith—Deserted Village, 2-3.
Gray—Elegy, 2-3.
Hawthorne—Twice Told Tales, Part I, 1.
Irving—Sketch Book (selections), 1.
Tales of a Traveler (selections), 1.
Lamb—Essays of Elia, 2-3.
Lincoln—Gettysburg Speech, 1.
Second Inaugural, 3.
Longfellow—Tales of a Wayside Inn, Part I, 1.
Evangeline, 1 or 8th grade.
Lowell—Crisis, 1-4.
Essays, 4.
Vision of Sir Launfal, 2.
Milton—Shorter Poems, 3-4.
Paradise Lost, 4. (Usually a failure in high school classes.)
Macaulay—Essay on Addison, 4.
Life of Johnson, 4.
Lord Clive, 3.
Milton, 4.
Warren Hastings, 4.
Palgrave—Golden Treasury, 1st series, 1-4.
Poe—Gold Bug, 1.
Poems, 2-4.
Pope—Essay an Man (outside), 4.
Iliad, Books I, IV, XX, 2.
Ruskin—Sesame and Lilies, 3-4.
Scott—Lady of the Lake, 1.
Ivanhoe, 1.
Schurz—On the Death of Lincoln, 3.
Shakespeare—Julius Caesar, 1-2.
Merchant of Venice, 1-2.
Midsummer Night's Dream, 3.
Tempest, 3-4.
Macbeth, 4.
Stevenson—Treasure Island, 1-4.
Tennyson—Enoch Arden, 1.
Idylls, 2.
Warner—Essays, 1-2.
Hunting of the Deer, 1-2.
Washington—Farewell Address, 4.
Webster—First Bunker Hill Oration, 3.
Adams and Jefferson, 3.
Whittier—Snow Bound, 1-2.
Wordsworth—Intimations of Immortality, 3-4.

GRAMMAR AND RHETORIC.

In English as in Latin the great instruments for reaching the above results are grammar and rhetoric; the former through syntax and analysis, and the latter through the paragraph and the theme. When the pupil definitely comprehends the relations of the different elements of the sentence, and when he knows the topic sentence and the relation of the other sentences of the paragraph to this topic sentence, he is in a condition to appreciate the value and the appropriateness of the setting of the thoughts as a whole.

A caution may be necessary here. The thought in the above is emphatically not to teach grammar as an end, but to use it as an instrument in getting the thought of what is being read. It should be made use of only when necessary for this. English grammar should continually be used in all of the years of the course as a means of criticism and interpretation. The fact is, that today, in many schools, it is almost never referred to outside of the grammar classes.

Every pupil, upon entering a high school, should be able to define the various terms employed in elementary grammar, to give the principal rules of syntax, rules for spelling and rules for use of capitals. It is especially necessary that pupils have some definite knowledge of the parts of the sentence, and ability to analyze and parse plain English.

The study of formal grammar as such, should have no place in the high school before the third or fourth year. The amount usually given in the grades is enough for use as an aid in the mastery of thought in reading, and in the correction of compositions, and it should be so used throughout the entire course. If pupils are found deficient and a special class is necessary, it can hardly be considered high school work.

If occasional weaknesses are found, it may be well to teach special topics as needed, with the distinct understanding that this is done that they may be afterward applied throughout the course.

A semester of formal grammar not earlier than the third year will prove an excellent disclipine as a training to distinguish niceties of thought and language with their appropriate modes of expression. By that time the pupil will have gained sufficient maturity to understand something of grammar as the science of language, and will be able to apply its laws in dealing with the difficult selections indicated for use in the fourth year.

The following syntactical and rhetorical rules, or a similar list, should be known in such form as to be readily reproduced at any moment.

RULES.

1. A noun or pronoun used as the subject of a finite verb is in the nominative case.
2. A noun or pronoun used to modify another by denoting possession is in the possessive case.
3. A noun or pronoun used as the direct object of a transitive verb or verbal is in the objective case.
4. A pronoun agrees with its antecedent in person, number and gender.
5. A verb agrees with its subject in number and person.
6. The tense forms and infinitives in subordinate elements should indicate time that shall correspond with the time denoted by the sentence.
7. Never use the past participle for the past tense, nor the past tense for the past participle.
8. The objective complement of a verb agrees in case with the object of the verb.
9. Modifying elements should be placed as near to the words they modify as other requirements will permit.
10. The parts of a sentence should be alike in form if they express like relations in the thought.
11. When a verb has two or more subjects, or a pronoun has two or more antecedents connected by or, or nor, it agrees with the nearest.
12. To express futurity use *shall* in the first person and *will* in the second and third. To express promise, purpose, determination, obligation or inevitable action which the speaker means to control, use *will* in the first person and *shall* in the second and third.
13. When a verb affirms something of many as individuals, it must be in the plural number.
14. The word *number* followed by *of* with a plural noun, meaning many or several, must have a plural verb; but *number* preceded by *the* takes a singular verb.
15. The comparative is used when two things or two classes of things are compared.
16. Do not use the adverb in place of the predicate adjective after verbs of incomplete predication.
17. Avoid the use of double negatives.

Note: A few simple but sufficiently adequate rules for the use of the comma and semicolon should be taught in connection with the study of grammar, and much practice in applying them to writing other than their own should be given; this, in connection with the study of grammar or with the study of composition.

HISTORY OF LITERATURE.

In many schools altogether too much time is spent in text-book study of the history of literature. In a majority of classes such study is uninteresting and unprofitable. It is likely to consist in the mere acquirement of a store of facts and book statements memorized for the occasion, and beyond the power of appreciation of the pupils. Such work does more harm than good, since the facts are forgotten long before the power to apply them in their proper relation is developed, and at the same time a dislike for the whole subject is formed.

When a student becomes so filled with the writings of any author that his personality becomes of interest, then the biography may be read with profit, but the biography of an author should usually be approached through his writings. In rare cases it may happen that the life of an author is so interesting as to arouse an interest in the masterpiece to be read. In such cases the teacher may be justified in approaching his work through his biography.

The writings of certain typical authors should be studied in class and accompanied by such a study of history and biography as to give the student, in an orderly manner, some definite ideas of the growth of literature, its relations to the time in which it is produced, and some notion of the growth of ideas. The history should serve as a frame work to systematic reading, and assist in giving some idea of the entirety of literature.

The above would imply that more or less of biography and history should be given throughout the course as a part of the study of English. The formal knitting together of this into a connected whole would, perhaps, naturally come in the fourth year. Inasmuch, however, as all students cannot take fourth year English under the present arrangement of courses, it would seem that the third year will best suit the conditions. A course of study should accordingly be so arranged that the classics read may be made the basis for the necessary grouping to give the brief general survey of literature adapted to high school work. An amount of time equal to not more than one period per week should be given to this formal study. If a text is used it should be rather for reference and arrangement of matter presented than as material for formal study.

If this work is taken in the third year as suggested, there will be opportunity in the fourth year for students who are not taking two foreign languages, to make an intensive study of some difficult English classics in a way which will give a training nearly or quite equal in value to that given by a foreign

language. The lack of this training is now one of the weak points in our English courses and it is very desirable that these courses be strengthened in this direction.

BOOKS FOR TEACHERS.

How to Teach Reading in the Public Schools—S. H. Clark. Scott, Foresman & Co.
The Teaching of English—Carpenter, Baker & Scott. Longmans, Green & Co.
Talks on the Study of Literature—Arlo Bates. Houghton, Mifflin & Co.
Talks on the Writing of English—Arlo Bates. Houghton, Mifflin & Co.
The Teaching of English—Chubb. Macmillan.
Lectures on Language—S. S. Laurie. Macmillan.
Education, Vol. XXV., No. 1., Sept. 1904.
First Steps in English Composition—Patterson. Flanagan.

MANUAL TRAINING.

The law provides that the courses of study, and the scope and character of the work shall be such as to meet the approval of the state superintendent. Up to the present time no definite general requirements in these respects have been made, but the work of each school has been individually considered.

The limit of twenty schools to receive state aid has been reached, and the status of manual training in Wisconsin is such that it is deemed best to establish a minimum amount of time and scope of work in such departments, the same to go into effect for the school year 1907–1908. It is highly desirable that schools receiving state aid for the year 1906–1907 shall approximate this limit, and in case any school falls considerably below, aid will be refused and the school taken from the list.

Scope of the Work.

The scheme of work should require at least seventy minutes daily for two years in the high school, preceded by preliminary preparation equivalent to one period weekly for one year. It should provide for two optional courses: (1) Instruction and

exercises in wood work and drawing. (2) Instruction and exercises in domestic science.

Specifically, course one should include:

(a) Instruction and exercises in free-hand and mechanical drawing of objects used as exercises.
(b) Instruction and exercises in bench work in wood-sawing, planing, tenons, mortises and joinery.
(c) Instruction and exercises in lathe work in wood, wood turning, face-plate, and center turning, polishing and simple designing.
(d) Project work.
(e) Lessons in kinds and qualities of woods, care of tools, etc.

While it is not intended that the following list shall be an arbitrary one, it includes in a general way what should constitute suitable work with tools for a course as indicated above. In schools which provide for a part or all of this in the grades more extended work in carpentry should be given.

Bench Work.

1. Exercise in squaring, gauging, chamfering, and rounding with plane.
2. Pointer.
3. Bench hook.
4. Plate mat.
5. Bill file.
6. Coat hanger.
7. Plant pot stand.
8. Pen tray.
9. Hatchet handle.
10. Broom holder.
11. Bracket shelf.
12. Towel rack.
13. Coat rack.
14. Knife box.
15. Half splice.
16. Mortise tenon.
17. Double tenon.
18. Mortise and tenon.
19. Keyed tenon.
20. Dovetail.
21. Half miter frame.

LATHE WORK.

1. Plain cylinder. Involving: Use of gouge in roughing and finishing; centering and preparing stock for lathe; sharpening tools; speed of lathe.
2. Use of turning or skew chisel.
3. Concave turning with gouge.
4. Convex aud concave turning. Practice with chisel and gouge.
5. Chisel handle. Polishing in lathe.
6. Turning tool handle.
7. Mallet.

8. Bracket. Relation of bench and lathe work.
9. Egg.
10. Rosette. Face plate work.
11. Additional face plate work.
12. Ring. Making and use of chuck.
13. Plate. Practice in chucking.
14. Goblet. Inside turning.
15. Napkin ring. Finishing on mandrel.
16. Hat rack. Practice in assembling.
17. Towel rack. Plain and face plate work combined.
18. Candelabrum. Same as above.
19. Mirror frame. Built up work.

Course two should include:

(a) Instruction and exercises in sewing—forms of stitches, piecing, hemming, darning, mending, patching, cutting, fitting, and making garments.

(b) Instruction and exercises in cooking—study of foods, dietetic values and combinations, uses and processes of cooking, invalid cooking, preparation of common foods—soups, meats, vegetables, bread, tea, coffee, cocoa, cakes, pies, puddings, etc.

(c) Serving of food, study of markets, food materials and their preservation, etc.

(d) Household management—drainage, water supply, ventilation, heating, lighting, etc.

PART III.

Laws and Forms.

STATUTES RELATING TO FREE HIGH SCHOOLS.

How established. Section 490 (as amended by Chapter 258, Laws of 1905). Any town, village or city school district or sub-district which contains within its limits an incorporated village or which has a graded school of not less than two departments may establish and maintain not exceeding two high schools in the manner and with the privileges herein provided; but no such school shall be established or maintained unless twenty-five persons of school age, resident of the town, city or village or school district, or sub-district, pass a satisfactory examination in the branches required to be taught in the common school and are prepared to begin a high school course. The question of establishing such schools may be submitted by the town, district, sub-district, village board or common council to the legally qualified voters at any annual or special meeting or election upon written resolution therefor proposed for adoption; provided that ten days' notice of such purpose embodying such resolution be given by posting five copies thereof in five different public places in such town, village, city, school district or sub-district, or by publishing such notice in any newspaper published in any such town, village, city, school district or sub-district, ten days prior to the time set for holding such meeting. In the case of a sub-district the meeting may be called by the clerk thereof. The vote shall be taken by ballot and canvassed according to the statutes for conducting elections in such municipality, those ballots in favor being written or printed "for high school," those opposed, "against high school." If the resolution be adopted such town, district, sub-district, village or city shall constitute a high school district. But this section shall not apply to high schools already

established. No action heretofore taken by any town, village, city, school district or sub-district in voting to form a high school or joint high school shall be invalid by reason of any defect in the form of notice given or the time such notice shall have been given, posted or published; but all steps heretofore taken by any town, village, city, school district or sub-district in forming a high school or joint high school are hereby validated, and declared to conform to law.

Joint high school districts. (Chapter 345, Laws of 1903, amending Section 491, Statutes of 1898, as amended by Sec. 1, of Ch. 57 of the Laws of 1899, and also amending Section 492 of the Statutes of 1898.) Section 491. Two or more adjoining towns or school districts, or one or more towns or school districts and an incorporated village or city, when the same together will make a district of contiguous territory, may unite in establishing and maintaining any such high school. The resolution proposing the same shall be approved and submitted and the notice of election signed by at least a majority of the supervisors of each town, the directors of each school district, the common council of such city and trustees of such village, if any, and the election shall be notified and conducted in each town, school district, city or village as provided in the preceding section. Such resolution shall not be adopted unless a majority of the votes cast in each such town, school district, city or village, be in favor thereof. The votes shall be canvassed at the first election, and all subsequent elections in the several towns as at town meetings, in the several school districts as at annual school district meetings, in the city, if any, as at a charter election, and in the village, if any, as at village elections; and the supervisors of the several towns, directors of said school districts, common council of such city and trustees of such village shall, within one week after such election, meet and canvass the votes and certify the result to the town clerk of each town, the clerk of each school district, the clerk of such city and to the village clerk of such village. If such resolution be adopted, the town, or towns, school district or school districts and city and village, so voting, shall constitute a joint high school district. The creation of a new town or incorporation of a village out of the territory included in a free high school district shall not dissolve nor otherwise affect such district but such towns or town and village shall

thereafter constitute a joint high school district. A town school district, incorporated village or city contiguous to a free high school district may become joint with such district upon the approval and submission of a resolution proposing the same and the terms thereof, and notice of election signed by a majority of the supervisors of each town, directors of each school district, common council of each city, and trustees of each village, if any, to be affected and the adoption of such resolution by a majority of all the votes cast in each such town, school district, city or village, the election to be had and the result canvassed and determined in the manner provided herein for the organization of a joint high school district in the first instance.

Certificate. Section 491a. (Statutes of 1898, as amended by Chap. 214, 1899, as amended by Chap. 345, Laws of 1901.) Whenever a free high school shall have been established and maintained as provided in sections 490 and 491 for at least three months, and the proper board shall have made the report required by section 496 in order to obtain the aid furnished by the state in maintaining free high schools, they shall append thereto a certificate that such school is established and maintained in a district composed of a town; of a town and an incorporated village within the town; of two or more towns; or of two or more towns and an incorporated village in one or in each of them.

State aid. Section 491b. (Statutes of 1898, as amended by Chap. 214, Laws of 1899, as amended by Chap. 345, Laws of 1901.) Upon receiving the reports and appended certificate provided for in section 496, it shall be the duty of the state superintendent to make a separate and distinct class of the schools thus established and maintained in the districts designated in section 491a as amended by this act, and each such school shall be entitled to receive from the general fund of the state, annually, one-half the amount actually expended for instruction therein; and said superintendent shall fix the amount to be paid to each of said high schools and certify the same to the secretary of the state at the time and in the manner he is now required to fix and certify to him the amount to be paid to high school districts. On such certificate, at any time after the first day of December, the same shall be paid to the district treas-

urer out of the state treasury; but the whole amount so paid shall not exceed twenty-five thousand dollars in any one year to this class of free high schools, and if more is demanded by such districts they shall be paid proportionally. The secretary of state shall annually include and apportion in the state tax all such sums as shall have been so paid, in addition to the amount authorized to be paid in aid of free high schools by section 496 and in addition to all other sums to be levied for the year.

Secton 491c. (Chapter 174, Laws of 1905.) It is hereby made the duty of the town, village, city or school district board to submit any resolution proposed in pursuance of section 491 as amended by section 1 of chapter 57 of the laws of 1899, as amended by section 1 of chapter 345 of the laws of 1903, to the voters of such town, village, city or school district upon the filing with said board of a petition in writing, praying for such submission, signed by at least ten per cent. of the qualified electors who voted at the last preceding gubernatorial election in such town, city, village or school district.

District officers. Section 492. (Statutes of 1898, as amended by Chapter 329, Laws of 1905, amending Chapter 345, Laws of 1903.) The officers of each free high school district shall be a director, treasurer and clerk, whose terms shall be each three years beginning with the annual town meetings, and until his successor shall have been chosen; provided that at the first election the clerk shall be chosen for one year, the treasurer for two years and the director for three years, and all of said officers may be chosen first at the same election at which the question of establishing a high school is submitted, to take their offices if the resolution therefor be adopted. Thereafter such officers shall be elected at the annual town meeting or charter election. The votes cast shall be canvassed and the result declared and certified as provided in the preceding sections. But in all cities not under a county superintendent which now constitute free high school districts or which shall hereafter adopt the resolution provided for in section 490 and become free high school districts, the board of education in each such city shall be the high school board and the city treasurer shall be ex-officio the treasurer of the high school district unless the board of education embrace a treasurer; and in all districts maintaining a graded school of not less thn two departments which

now constitute free high school districts or which shall hereafter adopt said resolution, the district board in each shall be the high school board and the district treasurer shall be the treasurer of the high school district. Whenever a sub-district shall vote to establish and maintain a free high school, such sub-district shall constitute a free high school district, shall elect a free high school board, the clerk for one year, the treasurer for two years and the director for three years; thereafter one officer shall be elected annually in place of the one whose term expires at the annual meeting of such sub-district, and such high school board shall perform all the duties and have the same authority as high school boards in towns or districts. The clerk shall certify all taxes levied for high school purposes to the town, city or village clerk, who shall apportion the same upon the taxable property of the sub-district, and the treasurer of such municipality shall collect the taxes thus apportioned and pay over the same to the high school treasurer and return the delinquent taxes to the county treasurer as in other cases. Where a high school district consists of two or more towns or school districts, or one or more towns or school districts and an incorporated village or city, the officers thereof shall be elected for the same terms as in other districts by joint vote of the town boards of such towns or the board or boards of the school district or districts ,town or towns, and three members elected by the board of the village or council of the city which have united in forming such district; except that in all cases where the free high school district is composed of one town and an incorporated village only, the election of a high school district officers shall be held at the time of the annual town meeting on the first Tuesday in April of each year at the usual polling places for holding such elections; provided that in cases where such usual polling places are outside the village limits and no village election is held on that day an additional and convenient polling place shall be provided for within the village limits. Separate ballots and a separate ballot box for school district officers shall be provided. The names of the candidates for school district officers voted for shall be printed or written on a ticket separate from the town ticket and the ballots cast at this election for school officers shall be canvassed and counted at a joint session of the canvassing boards of the town and village. Such town boards shall hold their first meeting to elect officers at two o'clock p. m. on the first Tuesday following

the town meeting, at the office of the clerk of the town having the largest population, and thereafter shall meet for such purpose at the same time at such place as may be determined upon. The first meeting of the board or boards of the town or towns or a school district or districts with the members elected by the board of any village (with the above exception) or council of any city which forms such a district shall be held at two o'clock p. m. on the first Tuesday next following the village or city election at the office of the clerk of such village or city; all subsequent meetings shall be held at the same time at such place as may be determined upon. A majority of all the members representing such town or towns, school district or districts, and such village board or city council shall be necessary to constitute a quorum. The secretary of the meetings of such boards shall certify the names of the officers of the district elected thereat to all the clerks of the towns, school districts, village or city in the district. The officers so elected shall have the same authority, be charged with the same duties and be under the same liabilities as other officers of such districts.

High school board—Township system. Chapter 253, laws of 1901. Section 1. (492a.) The town board of school directors in any township now organized or which may be hereafter organized under the township system of school government,shall be and is hereby constituted the free high school board for the town as a free high school district. In such cases the secretary of the town board of school directors, shall be ex-officio clerk, the president of the board shall be ex-officio director, and the town treasurer shall be ex-officio treasurer of the free high school board of said district. Said board is hereby authorized to perform all and singular the duties prescribed by law for free high school officers and boards, and the function and duty of free high school boards heretofore organized and acting as such in a free high school district consisting of a town having the township system of school government ,shall cease and be of no effect on and after the lawful surrender of records, papers, moneys and other property as hereinafter provided. The records and accounts of the board created by this act shall be kept separate and distinct from the records and accounts which the said board are required to keep as a town board of school directors. The free high school board in any

existing free high school district composed of a single town organized under the township system of school government, is hereby authorized and directed immediately upon the passage of this act, to deliver to the care and custody of the free high school board herein provided for in such cases, all records, papers, money, and other property of the free high school district, and the free high school board herein provided for shall accept the care and custody of such records, papers, money and other property and use them for and in behalf of the free high school district in conformity to law.

Officers' duties; other statutes apply. Section 493. Such officers shall constitute the high school board, and shall conduct the affairs of the high school district on the same general plan provided for a school district, and possess, with respect to such high school district, all the powers and be charged with all the duties conferred and imposed by these statutes on the district officers and district board of a school district applicable to such high school district; the treasurer shall give a like bond, to be approved and filed in a similar manner. The high school district clerk shall make a similar report to that required by section 462, omitting the first subdivision. The board may grade such school and establish the branches of study to be taught therein, under the advice of the state superintendent. Every forfeiture and punishment for neglect or violation of duty in a school district officer shall apply to a high school district officer for like neglect or violation. The reports of free high schools in cities not under a county superindent shall be included in the reports from such cities to the state superintendent.

Schools free; teachers' qualifications. Section 494. All such high schools shall be free to all pupils resident in the district. Every principal of such school shall, in addition to his qualifications as teacher of a common school, be a graduate of some university, college or normal school, hold a state certificate or pass an examination in the studies required to be taught in any such school; provided, the state certificates authorized by law and the certificates authorized by section 496a shall qualify their holders both as principals and as teachers of common schools; and each principal and assistant teacher in a free high school shall be eligible to teach only on approval of his certificate

by the state superintendent; and the high school board or boards of education having charge of such schools shall determine, with the advice and consent of such superintendent, the course of study and minimum standard of qualification for admission to the same.

Residents of towns and villages without free high schools may attend free high schools in other districts—Tuition, how paid. (Chap. 329, Laws of 1903, amendatory of Ch. 188 of the Laws of 1901.) Section 1. The free high school board of any free high school district organized under the laws of this state, shall admit to the high school under its control, whenever the facilities for seating and instruction will warrant, any person of school age prepared to enter such school, who may reside in any town or incorporated village, but not within any free high school district, and who shall have completed the course of study in the school district in which he resides, or one equivalent thereto. Persons so admitted shall be entitled to the same privileges and be subject to the same rules and regulations as pupils of the school who are residents of the free high school district.

Tuition fee, statement of. Section 2. Whenever persons, not residing in any free high school district and having completed the course of study in the school district in which they reside, or one equivalent thereto, as herein provided, enter any free high school, the free high school board of that district shall be entitled and is hereby authorized to charge a tuition fee for such pupils not to exceed fifty cents per week. On or before the first day of July in each year, the secretary of the free high school board shall make a sworn statement to the clerk of the city, town or village from which any person may have been admitted to said free high school. Said statement shall set forth the residence, name, age and date of entrance to such school, and number of months' attendance during the preceding school year of each person so admitted from such city, town or village; this statement shall show the amount of tuition which, under the provisions of this act, the district is entitled to receive for each person reported as having been a member of the school from such city, town or village, and the aggregate sum for tuition for all persons so admitted fom each city, town or village, which statement shall be filed as a claim against the town,

city or village where such person resides, and allowed as other claims are allowed.

Evidence of completion of course of study, what is sufficient. Section 3. The usual diploma issued by any school or school district organized under the laws of the state, shall be sufficient evidence of the completion of the course of study hereinbefore mentioned, and it shall be the duty of the state superintendent, in all cases where a course of study is not already prescribed, to prescribe a course of study and designate what shall constitute a completion thereof under this act. A duplicate of such diploma or a copy thereof duly certified as such, by any of the persons signing the original, shall be delivered upon request to the persons named therein, and shall be filed by him with the secretary of the free high school board of the free high school district, upon his admission to its high school. A certificate from the county superintendent of the completion of such course, or that the diploma hereinbefore referred to has been properly issued to the person named therein, shall have the same effect as such diploma, as evidence of the completion of the course of study. All duplicate diplomas, or certified copies thereof, or certificates of county superintendents so filed, shall be attached to the sworn statement of such secretary hereinbefore provided for.

Tuition, how collected in villages. Section 4. The village clerk shall enter upon the tax roll of the village for the ensuing year such sums as may be due for tuition on account of residents of the village who have attended such free high school or schools, and the amounts so entered shall be collected when and as other taxes are collected, and shall be paid when so collected, to the treasurer of the free high school district or districts, where such persons have attended the free high school or schools.

How collected in towns. Section 5. The clerk of any town not having within its territory a free high school district, shall enter upon the tax roll of the town for the ensuing year such sums as may be due for tuition on account of residents of the town who have attended such free high school or schools, and the amounts so entered shall be collected when and as other taxes are collected, and shall be paid when so collected, to the

treasurer of the free high school district where such persons have attended the free high school or schools.

How collected in portion of town or city not in district. Section 6. The clerk of any town or city, a portion of which constitutes or forms a part of a free high school district, shall enter upon the tax roll for that part of the town or city, not within a free high school district, such sums as may be due for tuition on account of residents of that portion of the town or city, that have attended such free high school or schools, and the amounts so entered shall be collected when, and as other taxes are collected and shall be paid when so collected, to the treasurer of the free high school district or districts where such persons have attended the free high school or schools.

Taxes, apportionment of. Section 495. The high school board shall annually, on or before the second Monday in September, meet and determine the amount necessary to be raised by tax for the support of such high school, and certify the same to the proper town, city or village clerk; if a joint high school district they shall certify to the clerk of each town or to such clerk and the village clerk the proportionate amount thereof to be raised by such town or village, such proportion to be determined according to the total valuation of all the taxable property therein as equalized by the boards of review, statements of which shall, as soon as the assessment is complete, be sent by the respective town or village clerks to the clerk of such district. Such tax shall be apportioned on the next tax roll by such clerk or other officer making the same, and collected and returned as other taxes, and paid to the high school district treasurer. Such moneys shall be paid out only on orders drawn and countersigned as prescribed in case of school districts. Any town which is a single high school district may, by resolution adopted at the annual town meeting, limit the amount to be raised for high school purposes during such year. In case of a joint high school district, the town boards of the several towns or of the town and village or towns and villages embraced may by joint resolution adopted by all such boards before the first day of July, likewise limit the amount to be raised therein.

Providing for town free high school buildings. (Chapter 123, Laws of 1903, amending Chapter 27, Statutes of 1898, by the addition of a new section to be known as Section 495a.) Section 495a. The electors of any town organized as a town free high school district are authorized at any annual town meeting or special town meeting, regularly called, to levy a tax upon the real and personal property of said town free high school district for the purpose of purchasing a site, erecting a suitable school building thereon, and furnishing said building with the necessary furniture, and heating and ventilating apparatus.

Powers of electors—Buildings for town free high school districts. (Chapter 351, Laws of 1905.) Section 1. Upon the filing with the town clerk or clerks of each town included in any town free high school district and with the village clerk of any village included therein, a petition in writing signed by at least ten per cent of the qualified electors of such town high school district as determined by the last preceding gubernatorial election asking to have submitted to a vote of the electors of said district the question of erecting a new school building therein or building an addition to a school house or furnishing such building with necessary furniture and heating and ventilating apparatus, the supervisors of the several towns and the trustees of any village included in any such joint free high school district, shall give notice of an election to be held in such towns or town and towns and village for the purpose of voting upon such question, which shall be submitted to be voted upon in the form of a resolution embodying the question to be submitted and the amount of money proposed to be raised for such purpose upon which the electors shall vote aye or nay, and such resolution shall be adopted if a majority of the total vote in the entire joint free high school district be in favor thereof. Before issuing notice of such election the town clerks of the several towns and villages if any, included in such school district, shall meet and determine on a time for holding such election, which shall be held in each town and village upon the same day, and within ten days after such election shall have been had the clerks of the several towns and villages included in such district shall meet and canvass the returns of such election and announce the result thereof and make a written report thereon and file the same with the clerks of the several towns

and villages included in such school district. Such election shall be noticed and conducted and the votes counted in the several towns as at town meetings and in a village, if any, as at village elections.

Borrowing money. (Chap. 342, Laws of 1901.) For the purposes expressed in section 474 of the statutes of 1898 and chapter 40 of the laws of 1901, any high school district board is hereby authorized and empowered to borrow money whenever directed by the electors of such high school district assembled at a meeting regularly called and held for that purpose, pursuant to the provisions of section 427 of the statutes of 1898. The payment thereof shall be provided for by said board by a tax to be raised and certified as provided in this section.

State aid, how obtained. Section 496. (Statutes of 1898, as amended by Chap. 214, Laws of 1899, as amended by Chap. 345, Laws of 1901.) Any high school district which shall have established a free high school according to the provisions of these statutes, and shall have maintained the same for not less than three months in any school year, shall be entitled to receive from the general fund of the state annually one-half of the amount actually expended for instruction in its high school during such year over and above the amount required by law to be expended for common school purposes, but not to exceed in one year five hundred dollars to one district: provided, this limitation shall not apply to the class of high schools designated in section 491a, as amended by this act. To obtain such aid the high school board, or in cities not under a county superintendent, the president and secretary of the board of education and the treasurer, shall on or before the first day of November, report in duplicate to the state superintendent, under their oaths the amount actually expended for instruction during the previous school year, specifying the several items thereof, with the date and the object of each fully. Thereupon said superintendent shall fix the amount to be paid such district and certify the same to the secretary of state with one of such reports annexed; provided, the state superintendent may withhold such certificate from any district for reasons based upon failure to comply with the law relating to free high schools which reason he shall transmit to the school board thereof on

or before the thirteenth day of the next succeeding June. On such certificate, at any time after the first day of December, the certified amount shall be paid to the district treasurer out of the state treasury. The secretary of state shall annually include and apportion in the state tax all such sums as shall have been so paid. Whenever, by any neglect or omission, any free high school shall fail to have apportioned to it its share of state aid, the state superintendent may, after the time hereinbefore fixed for such apportionment by him, fix an amount ten per centum less than the amount which such school would have been entitled to had it complied with the provisions of this section, and certify the same to the secretary of state with the report of such district annexed thereto, and the secretary of state shall thereupon draw his warrant for such amount or amounts in favor of such district. The whole amount annually paid under the provisions of this section shall not exceed seventy-five thousand dollars, and if more be demanded by such districts they shall be paid proportionally; provided, that if the whole amount authorized to be paid annually in aid of free high schools as provided by section 491b as amended by this act, is not demanded or expended under the provisions of that section then the unexpended balance of the amount therein annually authorized to be paid in aid of such schools may be added to and apportioned among the free high schools provided for in sections 490 and 491; but no more than one hundred thousand dollars shall be apportioned to both classes of schools in any one year.

Supervision and course of study. Section 496a, (as amended by Chap. 429, Laws of 1901). The state superintendent shall prepare a course or courses of study suitable to be pursued in free high schools, publish the same and furnish the same upon application. He shall exercise such personal supervision and make such personal inspection of the work of all such schools as they seem to require and the other duties of his office may warrant; he shall examine or cause to be examined all teachers of high schools, required by law to pass special examinations to qualify them for teaching in high schools, and grant certificates to such as pass examinations satisfactorily, which certificates shall be in such form and for such time as he may prescribe, and shall authorize the holder to teach in such special place or places, or in the whole state, as the qualifications of

the candidate may warrant. Each free high school shall offer at least a twelve weeks' course of instruction each year in the theory and art of teaching; in the organization, management, and course of study of ungraded schools; and in the duties of citizens in the organization and administration of local school systems. Such a course of instruction shall be open to all students in this school and a satisfactory standing in the work of this course shall be a condition precedent to the countersignature of a diploma held by a graduate of the school as provided in section 7 of this act. Said superintendent shall furnish suitable blanks for annual and special reports for all such schools, which shall require returns as to the number, age and sex of all pupils enrolled, the number in each class or year in the course of study, the number pursuing English branches only,the number completing the course of study each year and such other statistics as may be deemed necessary.

Manual training. Section 496b. Any board having charge of a free high school or of a high school having a course of study equivalent to the course or courses prescribed by the state superintendent for such schools may establish and maintain a department of manual training in connection with the school under its management. The expense of maintaining such department shall be provided for in the same manner as other expenses of maintaining high schools, and such department shall be under the management, direction and control of such board. The state superintendent shall, so far as his other duties may warrant, give such information and assistance as may seem necessary in organizing and maintaining such departments, and in arranging schemes and outlines of work; and with the aid of the inspector of high schools shall have the general supervision of all manual training departments established under this section; shall from time to time inspect the same, make such recommendations relating to their management as he may deem necessary, and make such report thereon as shall give full information concerning their number, character and efficiency. The state superintendent shall establish a standard of qualification for all teachers in such department, and may grant special certificates to such applicants as are fully qualified to instruct in special lines of manual work, which certificates shall be in such form and for such time as he may prescribe, and shall be regarded as qualifying the holders thereof to teach in any manual training department.

State aid for manual training department. Section 496c, (as amended by Chap. 273, Laws of 1899). Any high school whose course of study or outline of work in manual training has been approved by the state superintendent, and whose teacher has been qualified may, upon application, be placed upon an approved list of schools maintaining manual training departments. A school once entered upon such list may remain there and be entitled to state aid so long as the scope and character of its work are maintained in such manner as to meet the approval of such superintendent. On the first day of July in each year the clerk of each school board maintaining a school on the approved list or the city superintendent of any city where such an approved school is maintained, shall report to the state superintendent in such form as may be required, setting forth the facts relating to the cost of maintaining the manual training department thereof, the character of the work done, the number and names of teachers employed, and the length of time such department was maintained during the preceding year. And upon the receipt of such report, if it shall appear that the department has been maintained in a satisfactory manner for a period of not less than six months during the year, the said superintendent shall make a certificate to that effect and file it with the secretary of state. Upon receiving such certificate the secretary of state shall draw his warrant for two hundred and fifty dollars payable to the treasurer of the district or corporation maintaining the school; provided, that the total amount expended for such purpose shall not exceed five thousand dollars in any year.

Certification of manual training and domestic science teachers. (Chapter 64.) Section 1. A diploma granted by the board of regents of normal schools to any person who completes the training course for teachers of manual training or of domestic science, established by said board in any of the state normal schools, shall be regarded as a certificate legally qualifying the holder thereof to teach manual training and domestic science respectively for one year in any school forming a part of the public school system. The state superintendent may, after such examination as to moral character, learning and ability to teach, as to him may seem proper, countersign such diploma if, since receiving it, the holder has taught manual training or domestic science in a public school in this state one year, and thereafter

such countersigned diploma shall qualify the holder as a teacher of manual training or domestic science as the case may be, until the same shall be annulled.

Other diplomas; special license. Section 2. The holder of a diploma granted by any manual training school or school of domestic science, upon the completion of a training course for teachers in either subject fully and fairly equivalent to the course of instruction for teachers in the same subjects prescribed by the board of regents of normal schools, may present such diploma, together with the evidence of the required standing of the training school issuing such diploma, to the state board of examiners. The applicant shall furnish therewith testimonials of good moral character and of two years' successful teaching of manual training or domestic science, as the case may be, in the public schools of the state after the date of such diploma. The holder of any such diploma, recommended favorably by the board, shall be entitled to receive a certificate issued by the state superintendent, qualifying the holder as a teacher of manual training or of domestic science, until the same shall be annulled. The holder of a diploma granted upon the completion of a course of study, accredited as herein provided, upon which a state certificate has not been issued, upon the recommendation of the board of examiners made in pursuance of such examination as to learning, moral character and ability to teach as said board may require, may be given a special license by the state superintendent to teach manual training or domestic science as recommended by the board, for two years in the public schools of the state.

Countersignature of high school diploma by county superintendent. Section 452a. The free high school board shall make out and deliver to each graduate of the high school at the time of graduation, a certificate of his standing in the branches pursued by him in such school; and if such graduate of a high school, having a four years' course, receive a first grade certificate from any county superintendent, and furnish to him or to any other county superintendent, a certificate from the free high school board that includes a satisfactory standing in theory and art of teaching, based on a study of this subject in a free high school for at least twelve weeks and furnish also satisfactory proof of having taught success-

fully at least one school year, under such first grade certificate, such county superintendent may countersign his certificate of graduation or diploma at any time before the expiration of the first grade certificate, and affix the date of such signature thereto. The diploma so countersigned shall have for the period of five years thereafter, the force and effect of a first grade certificate. It shall be lawful for more than one county superintendent to countersign the diploma, but no countersignature shall have the effect of extending the diploma as a first grade certificate beyond the expiration of the five years immediately following the date of its first countersignature.

State superintendent; special licenses; state certificates; diplomas. (Chapter 231, laws of 1905.) Section 458i. The state superintendent is authorized and empowered to countersign diplomas and issue state certificates to persons who are engaged in supervising work in the public schools or teaching in colleges or normal schools, otherwise legally qualified under existing statutes or are recommended by the state board of examiners.

Section 458j. The state superintendent may issue a special license good only until the next meeting of the state board of examiners in cases where the applicant gives satisfactory evidence that his qualifications and credentials shall meet the requirements of the board of examiners; said temporary license to be issued only in urgent cases and in order that the school board, or board of education may be legally authorized to pay the salary of said teacher from the funds of the district for services rendered.

Section 458k. The state superintendent may upon the recommendation of the state board of examiners, grant a special certificate legally qualifying the holder to teach such special branch or branches in the public schools as may be named on the face of the certificate.

Section 458l. Upon the recommendation of the state board of examiners an applicant may be granted a limited special certificate qualifying him to teach not more than one special branch in the public schools, said certificate being limited to one particular school or district to be named in the certificate, said certificate to be null and void in any other school or district.

FORMS FOR ESTABLISHING FREE HIGH SCHOOLS.

No. 48.

Form of resolution proposing establishment of a town free high school.

In order that the question of establishing and maintaining a town free high school in the town of ———— may be properly submitted to the electors of said town for consideration and final determination, the following resolution is proposed for adoption:

Resolved, by the undersigned town board of supervisors of the town of ————, that a town free high school be established, organized and maintained in said town and the town clerk is hereby directed to give due notice that this resolution will be submitted to a vote of the duly qualified electors (men and women) of the town of ———— at the annual town meeting, (or at the general election on the first Tuesday after the first Monday in November; or at a special town meeting or election) to be held in said town of ———— on the ——— day of ————, 190—.

Dated this ——— day of ————, 190—.

Signed:

————,

————,

————,

Board of Supervisors.

Form of notice that the foregoing resolution will be submitted to vote.

Notice is hereby given in accordance with a resolution adopted by the board of supervisors, to the duly qualified electors (men and women) in the town of ————, county of ———— that at the annual town meeting, (or at the general election on the first Tuesday after the first Monday in November; or at a special town meeting or election) to be held in the said town of ———— on the ——— day of ————, 190—, the following resolution will be submitted to the vote of the electors of said town:

Resolved, that a town free high school shall be established and maintained in said town of ————, and further that at said election there shall be chosen a town free high school board consisting of three persons who shall take their offices if said resolution shall be adopted, the clerk for one year, the treasurer for two years and the director for three years, the time elapsing between their election and the next annual town meeting to be considered as one year.

Dated this ——— day of ————, 190—.

————————,

Town Clerk of the Town of————.

No. 48a.

Form of resolution proposing the establishment of a school district free high school.

In order that the question of establishing and organizing a school district free high school in (joint) district No. —— of the town (or towns) of ————, ———— county, Wisconsin, may be properly submitted to the electors, men and women, of said district for consideration and final determination, the following resolution is proposed for adoption:

Resolved, by the undersigned board of education (or school district board) of (joint) school district No. ———, ———— county, that a district free high school shall be established, organized and maintained in said district. The district board is hereby authorized and directed to give due notice that this resolution will be submitted to a vote of the duly qualified

electors, men and women, of said school district (joint) No. ————, at the regular annual district meeting (or at a special school meeting) to be held in said district on the ——— day of ————, 190—.

Dated this ——— day of ————, 190—.

Signed

————,

————,

————,

Board of Education (or School District Board).

Form of resolution proposing the establishment of a school district free high school.

Notice is hereby given to the duly qualified electors, men and women, of (joint) school district No. —— of the town (or towns) of ————, ———— county, Wisconsin, that in accordance with a resolution adopted by the board of education, (or school district board) the following resolution will be submitted to the vote of the electors of said district at the annual meeting (or at a special district meeting) to be held on the ———— day of ————, 190—:

Resolved, that a district free high school shall be established and maintained in said district No.——, town (or towns) of ————.

Dated this ——— day of ————, 190—.

————,

District Clerk of District No.————

No. 50.

Form of certificate to be forwarded to the State Superintendent preliminary to securing the certificate of establishment and organization of a town free high school.

This certifies that on the —— day of ————, 190—, the legally qualified voters, men and women, of the town of ——— ———, assembled at the annual town meeting (or at the general election held the first Tuesday after the first Monday in November; or at a special town meeting or election) voted and adopted the following resolution submitted by the town board

of supervisors, having for its purpose the establishment, organization and maintenance of a town free high school in said town of ————————, ———————— county, Wisconsin:

Resolved, that a town free high school be established, organized and maintained in said town of ————————, ———————— county, Wisconsin. —

It is hereby further certified that this election was held pursuant to law and after due notification and that the electors of ———————— voted by ballot as follows:

Males	(For town free high school————	
	(Against town free high school————	
Females	(For town free high school————	
	(Against town free high school————	

Total votes for town free high school———

Against town free high school———

It is further certified that the following persons were voted for as officers of said town free high school and were declared duly elected and that each of said officers has each for himself given his signature hereto:

Clerk————————Term expires————————

Director————————Term expires————————

Treasurer————————Term expires————————

No. 50a.

Form of certificate to be forwarded to the State Superintendent to secure a certificate of establishment and organization of a district free high school.

This certifies that on the ——— day of ————————, 190—, the legally qualified voters, men and women, of (joint) school district No. ——— town (or towns, or village) of ————————, county of ————————, assembled at the annual school district meeting (or at a special district meeting) held on the ——— day of ————————, 19—, voted upon and adopted the following resolution submitted by the school district board (or board of education) of said school district No.————————.

Resolved, that a district free high school be established, organized and maintained in (joint) school district No.——— town, (or towns, or village) of ————————, ———————— county, Wisconsin.

It is hereby further certified that said election was held pursuant to law and after due notification and that the electors voted by ballot as follows:

Males	(For district free high school————	
	(Against district free high school————	
Females	(For district free high school————	
	(Against district free high school————	

Total votes for district free high school————

Against district free high school————

In accordance with the above facts we the undersigned school district board (or board of education) do hereby request you as State Superintendent to issue a certificate establishing a district free high school for said school district No. ————.

Signed:

————————, Director.
————————, Clerk,
————————, Treasurer.

———

The following method of procedure is suggested to school boards in the case of non-resident pupils attending Free High Schools, as a means of preventing friction and misunderstanding in applying the new law relative to tuition. A printed blank similar to the following, is signed by the applicant, county superintendent, and a supervisor of the town in which the pupil resides and presented in duplicate by the applicant shortly after entering school would serve to give notice to all parties interested, and would also be sufficient evidence thereafter, when attached to the bill for tuition, that the pupil has completed the course of study for common schools.

Let the principal issue these blanks to pupils upon entering school. When the candidates have filled them out and signed them, the principal should then forward them in duplicate to the county superintendent. When signed by him, let them be returned to the principal who in turn may send them by the applicant, to be signed by a supervisor of the town, and to be returned by him to the clerk of the school board.

Ths certifies that ——, age ——, is a resident of the Town of ——, County of ——, State of Wisconsin, and that —— has completed the course of study prescribed for common schools, and is entitled to all privileges granted in Chapter 329, Laws of 1903, amending Chapter 188, Laws of 1901, for the school year beginning ——.

—— ——,
County Superintendent.

—— ——
Applicant sign here.

—— ——
Supervisor,
Town of——.

Dated——.

The above blanks will not be furnished by this office, but would need to be prepared by the High School Board.

No. 51.

The following form is intended to show what items are to be prepared by the principal at the close of the school year, as a part of his report to the free high school board:

STATISTICAL REPORT OF THE FREE HIGH SCHOOL AT.....
FOR THE SCHOOL YEAR ENDING JUNE 30, 190—.

	Male	Fem'le	Total
1. Number of teachers employed including principal.....	.....	.....	.....
2. Number of pupils registered not over 20 years of age..	.....	.....	.....
3. Number of pupils registered over 20 years of age.....			.....
4. Average daily attendance			.....
5. Number of days of High School (including holidays).....			.....
6. Number of pupils in English branches only.....			.....
7. Number of pupils in German.....			.....
8. Number of pupils in Latin.....			.....
9. Number of pupils studying both Latin and German.....			.....
10. Number of pupils in Greek			.....
11. Number of pupils studying both Latin and Greek.....			.....
12. Cost of instruction in German $..... In Latin $..... In Greek $.....			.....
13. Average age of pupils entering the High School. Males..... Females			....
14. Average age of pupils at leaving the High School. Males..... Females.			.....
15. Number of persons who graduated in 190—. Male..... Female.....			.....
16. Number of these who have taught at any time since graduation. Male..... Female.			.....
17. Number of graduates this year. Males..... Females.....			.....
18. Number graduates since organization of school— Males..... Females..... Total.....			.....
19. Number years required to complete the course of study.....			.....
20. Is the school on the Univ. Wis. accredited list.....			.....
21. Number of non-resident pupils during year.....			.....
22. Rate of tuition for non-residents per month.....			.....
23. Total amount received and due for tuition.....			.....
24. Average yearly salary of the high school assistants.....			.....

25. Total amount of salaries of principal and assistants.....	.....
26. What portion of the principal's service is given to the actual supervision of the grades below the high school?.....	.....
27. Name the high school branches actually taught by the principal....	.....
28. Give total number of pupils enrolled in each grade in the high school, 1st year....., 2d....., 3d....., 4th (or senior).....	.....
29. Does the high school district furnish the text books? If so, are they free, rented, or sold to the high school pupils?.....	.....

Name of Principal .....

Salary of Principal .....

Names of assistants .....

....

Is the Principal Superintendent, also? .....

I hereby certify that the above is correct.

....., Clerk.

NOTE.—Two copies of this report are sent, one of which should be returned to the State Superintendent on or before July 10, and the other filed among the clerk's records. Statistics relating to High School departments *only* should be given. Do not omit to fill out *every* blank space by some mark, words or figures. Write the first name of each assistant in full.

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