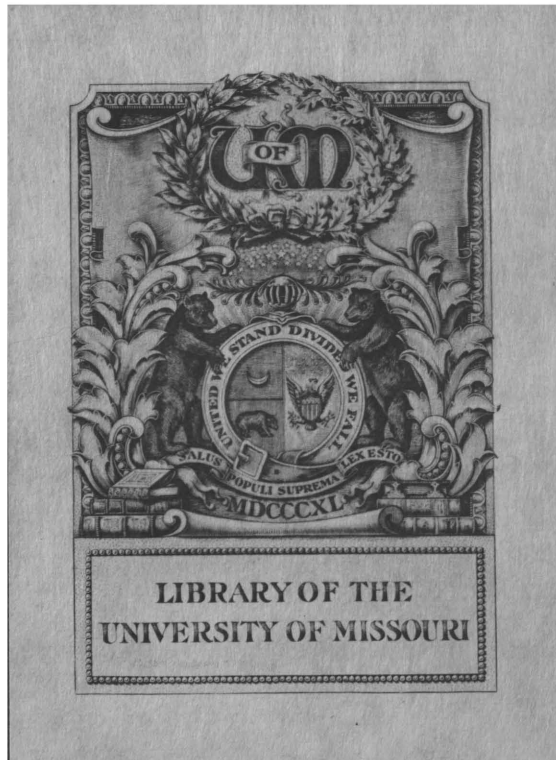


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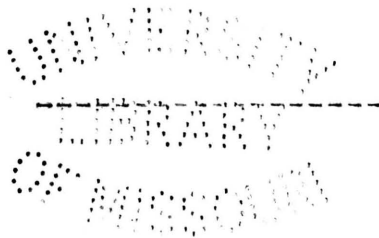
Form 26

A STUDY IN SEVENTH GRADE

SUBJECT-MATTER

by

Herman Heinrich Mecker, B. S. in Ed., A. B.



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PREFACE

Two years ago the writer came into the University Elementary School to devote about half time to teaching the seventh grade and the other half to graduate work in the University. As the writer worked along he found that the Elementary School offered as much opportunity to do graduate study as any work taken in the University. Therefore in working on the course of study for the seventh grade it seemed very feasible to embody some of this study in a Master's thesis. As a result the following thesis attempts to describe what the writer has been doing in connection with seventh grade work. The thesis does not give a theoretical discussion of what might be done, nor does it represent an experiment carried on for the purpose of a thesis. The writer decided to write this thesis only after working in the school for some time and after realizing the richness of the field. The thesis, then, describes work that is actually going on and which, it is felt, is meeting with a fair degree of success.

The writer is very gratefully indebted to Dr. J. L. Meriam, Professor of School Supervision, under whose direction this study was made possible.

TABLE OF CONTENTS

Chapter I, The General Setting -----	1-16
General statement of the University Elementary School	
Topics studied in grades V-VII	
Method used in grades V-VII,	
Content of the formal public school subjects in connection with these topics	
Purpose of the thesis	
Explanations in interpreting the outlines of these topics	
Chapter II, The Topic of Transportation in Detail ----	17-50
Part I, Transportation in grade VI	
Part II, Transportation in grade VII	
Introduction	
Outline	
Chapter III ¹ , General Outline of the Topics in Grade VII-	51-66
Chapter IV, Evaluation -----	67-84

A STUDY IN SEVENTH GRADE SUBJECT-MATTER

CHAPTER I

THE GENERAL SETTING

General statement of the University Elementary School: The University Elementary School is maintained by the School of Education of the University of Missouri for experimental purposes. It is not, however, a place where present school methods are tested scientifically, as in a psychological laboratory. Arithmetic, for example, is not taught according to different methods to see what the advantages of each may be. An attempt is made (1) to select and arrange a curriculum, which will give the chief fundamentals that are now taught in the public schools and which will include a great deal of valuable material that now has no place in the school and (2) to present this in a way that will appeal to the pupils much more strongly than in the traditional school. The course of study is outlined on the basis of seven grades; after completing these, the pupils are promoted to the High School.

The writer has been working in the school for the last two years, as a graduate student, devoting about half time to the seventh grade work. In 1911 - 1912 this grade consisted of 9 pupils - 7 girls and 2 boys, and in 1912 - 1913, of 13 pupils - 7 girls and 6 boys. One of these was a student from Japan, who had been admitted to the University, but was in the Elementary School to learn the English language.

It is felt that the public schools should meet the needs of the boys and girls more efficiently than they do at present. The content of the present curriculum is influenced too much by tradition. As society develops and becomes more complex, the curriculum of the schools ought to change to meet new conditions. This is chiefly an industrial age. A great many experiences of this age should be given a place in the elementary school. Such things as the elementary principles and conditions of manufacturing, transportation, etc., ordinarily have no place in the curriculum. Yet everybody is vitally connected with these activities. Instead of this the educational field has been divided into separate subjects as reading, writing, arithmetic, etc., having little relation to each other or to life experiences. It seems possible, therefore, that a curriculum might be formulated where these industrial activities have a place without neglecting the important processes of arithmetic, the chief facts of grammar, etc.

Four of the principles upon which the work of this school is based, and with which this thesis is directly concerned, are: first, the school should help the pupils solve problems which exist in the immediate present, rather than those of the future; second, concrete material rather than abstract generalizations should be considered; third, the pupils' experiences should be divided into two phases, work and leisure; fourth, number work, reading, writing, etc., can be learned more effectively when regarded as quite incidental to these concrete activities.

As usually stated, education is to prepare the pupils for later life. It will be taken for granted that all pupils, at whatever age we may select, have interests of some kind. These, of course, will vary at different ages. Pupils as a rule do not look into the future as much as adults; they demand that the rewards be closer at hand. If this is the case, it certainly would be better to consider these interests in outlining a curriculum. In this way, a natural, normal motive can be obtained for education. It is for this reason that the University Elementary School takes the position that education should help the pupils solve their immediate needs. It is also maintained that this method will constitute the best training for solving future problems and that it is therefore the best preparation for later life.

Concrete material, in the second principle, means that things are to be considered in their proper social setting. Arithmetics ordinarily give such problems as these: $45 \times 18 = ?$; If 3 dozen eggs cost 75¢, how much will 5 dozen cost? These are abstract because they have no real significance. So far as the pupil is concerned, they are not realities. However, if in studying the grocery stores in Columbia we wish to find out the total daily receipts and expenditures of a certain grocer, it may be necessary to find out how much 45 dozen eggs at 20¢ a dozen cost, in order to get the daily expenditure. In this case the problem has a vital significance and there is a real motive in working it.

As expressed in the third principle, the life of the child should be divided into two phases, work and leisure. In this industrial age there is a general tendency to shorten working hours and to increase the leisure time of adults. The great problem, then, is to spend this leisure time profitably. A great many difficulties arise because adults do not spend this time well. There is no doubt on the other hand, that all pupils have work to do. Dressing themselves, doing chores around the house, etc. are examples of this. All play, reading or other exercises for the sake of immediate pleasure, are here classed as leisure for children. This fact, then, means that the elementary schools ought also to help the pupils

Spend their leisure time well. Ability to enjoy and take part in wholesome games, singing, story-telling, reading, etc. will aid materially in this respect.

By the fourth principle is meant that the important and necessary content of the formal subjects can be learned incidentally by using these processes, when needed, in studying problems which are vital in the pupil's experience. The pupils feel a vital interest in the Columbia shoe factory. Any written work, number work, etc. that can be done in connection with this institution would be incidental, although concrete.⁽¹⁾

With these principles in view, certain industrial activities were more or less arbitrarily chosen, which form the basis of work in grades IV-VII. It is felt that when the pupils reach grade IV they are somewhat interested in the activities of adults. The local industries- such as the laundry, mercantile stores, ice-plant, fire department, etc. - are studied. Grades V to VII study the activities of the world such as fishing, lumbering, mining, farming, manufacturing, transportation, etc.

(1) For the effectiveness of this method, the reader is referred to the Master of Art's thesis by Ernest Horn on "An attempt to remedy some of the defects of the modern elementary curriculum", 1908.

The following is the schedule for grades V- VII. Examination of this will give the clearest idea of the apportionment of the time. This schedule is not followed rigidly, however, as circumstances often demand modifications.

	(1)	
9:00	- 10:30	Industries- grades V-VII
10:30	- 11:00	Free play and organized games and exercises- about 15 min. for each.
11:00	- 12:00	Industries continued
12:00	- 1:30	Noon period
1:30	- 2:00	Grade VII, English Literature Grades V & VI, German
2:00	- 2:30	Grade VII, German Grades V & VI, English Liter- ature
2:30	- 2:50	Grades V-VII: (M.W.& F. Music T.&Th. Art)
2:50	- 3:00	Pause(as in German Schools)
3:00	- 4:00	Handwork

(1) Usually opening exercises occupy from 10 to 15 minutes. On Wednesday morning there is a half-hour assembly period when the entire school meets together.

The work of grades I - III is based upon four activities: observation, play, story-telling, and handwork. ~~All~~ The things in which children are interested and which are around them are observed and studied. Play here has absolutely nothing to do with recess periods; it refers to specially well directed games which are interesting and of an educational value. Story-telling refers to the reading, telling and dramatization of simple interesting stories. Handwork likewise consists of making simple things that the pupils are able to do, but things that are of practical use or are such as to contribute enjoyment to them or their parents.

Topics studied in grades V-VII: As stated above, the chief industries in which the world is engaged constitute the real center of study. The topics of grade V are (1) recreation, (2) hunting, (3) fishing, (4) lumbering, (5) mining, and (6) farming; of grade VI, (1) manufacturing, (2) transportation (including the telegraph and telephone), (3) forms of business (as banking, insurance, mercantile, etc.), (4) government and its activities (the army, navy, postoffice, etc.), (5) school life (life of the children in schools of other countries), and (6) manners and customs (chiefly the home life of other nations). Grade VII then studies these same topics in the light of the past. For example, grade VI studies manufacturing as we find it today; grade VII then takes it up as we find it among the Greeks, Romans, early English, early Americans, etc. No attempt is made to take it up chronologically, however, but merely to point out some of the interesting facts as we find them.

(Note: There is one exception to this.

The study of present-day government has been found rather difficult for grade VI and has been placed in grade VII temporarily).

No two topics are taken up at the same time. Each is studied individually. After one is completed, another is taken up. The pupil's attention is therefore centered upon only one

subject at a time. This saves a great deal of time since changing from one to another, as from arithmetic to grammar, etc., results in a loss of time, on the part of the pupils, in making proper
(1)
adjustment.

(1) See Ernest Horn's Master's thesis on "An attempt to remedy some of the defects of the modern elementary curriculum, " pp. 14-16.

Method used in grades V-VII: Method here has to do with the general management of the school and classes, rather than certain methods in the conducting of class work as such. Although the method of the school is very much alike in each grade that of grades V-VII is here pointed out, as it deals directly with this thesis.

The general spirit is that of freedom and cooperation. The pupils are encouraged to move about the rooms and talk freely of their work at practically all times of the day. For this reason free tables and chairs rather than benches fastened to the floor are used. This gives a great deal more freedom to the pupils in helping each other with their problems.

The library of about 1300 volumes furnishes practically the whole source of book information. No definite text-books are used by the pupils. References to a number of books are given by the teacher and various pupils read different books on particular topics. In this way each pupil has something to contribute which, he is reasonably certain, will not have been read by the entire class before. The class work then consists in organizing this information into a definite order. The teacher is a sort of director to guide the pupils in their work rather than a listener to recitations made by them.

Class work and study periods are not carried on in exactly the same way that we ordinarily find in the public schools nor at regular stated times. A great deal of the work is individual; time and circumstances determine to a large extent when class work is to be given. This class work consists of discussion, reading, map study, arithmetical calculations, picture study, observation and experiments for certain principles, etc. These methods are used when needed. For example: since no text-books are used a class period may open in some morning by simply reading on a particular topic; or by studying pictures, etc. The study period then consists in further reading and in the writing of reports and the drawing of pictures which are later collected into booklets and kept as a permanent report of the pupils' work. Sometimes an entire class period may be devoted to arithmetical work in making certain comparisons; at another time grammatical study may take up a large part of the period when making criticisms on the written reports.

Content of the formal public school

subjects in connection with these topics: To more clearly understand the outlines which follow, a word must be said about the method of studying "spelling", "writing", "arithmetic", etc., incidentally. The topic of lumbering is given to illustrate this. In connection with this topic a study of geographical facts is made in locating the chief lumbering sources as well as the distributing points; a study of arithmetical facts, in making comparisons of output and in the preparation of lumber for market; a study of grammatical facts, as well as spelling and writing, in the preparation of written reports on the particular topics. Reading is done chiefly in the preparation or in the obtaining of facts by the use of books. The same thing applies to the various other topics.

Purpose of the thesis: The object of this thesis is to describe what the writer has attempted to do in this industrial study in connection with grade VII. An outline of the work of the entire grade, so far as it has been developed is given, and also a more extended outline of one topic (transportation) presented to show more in detail what material is taken up. A short outline of transportation in grade VI is also given to show what preceded transportation in grade VII.

Explanations in interpreting the outlines

of these topics: In reading these outlines it should be kept in mind that they are not given as the only solution for the problem. In selecting topics, these were chosen as probably the most important ones worthy of study. No attempt is made to include everything; on the other hand some material may be included that is not relatively worthy of a place.

In the main the seventh grade topics represent an attempt to study the present activities of people as we find them in the past. In studying both the present and the past condition of any industry, it is maintained, that the important content of the formal subjects given in schools, will be inevitably acquired because this content is necessary to carry on this industrial study.

(Note: Accuracy, so far as the facts in these outlines are concerned, can not always be vouched for. The outlines were taken from such books as were available for the pupils to read. The authors cannot, therefore, always be considered as final authority. The pupils are also impressed with this fact and are encouraged to look for further information when certain data appears questionable.)

The outlines are given topically to show what industrial facts are taken up. No references are given as to when arithmetical work, grammatical study, etc. are made. The topics in themselves show when these studies can be made;

they are carried out in the class room when called for. For example, the table under no. 1 on " Railroads" indicates a need for arithmetical work without specific mention of the fact. Likewise when sentences are improperly stated or words misspelled, corrections are made without specific reference to it in these outlines. Therefore it must be remembered that these outlines show the center of study and not the opportunities when grammatical and arithmetical study is to be made. A teacher in presenting these outlines to a class must see when the "Three R's" are needed. The guiding question must always be: to what extent is it worth while now to study this topic. A study of railroad transportation is not satisfactory, without studies in quantitative problems, geographical problems, etc.

The outlines (with the exception of transportation) are very general. Only the large divisions are indicated. They are to give an idea of the general plan. This one topic (transportation) is given to show, more in detail, how the discussion is given. No outline is to be considered complete, however, as the purpose is to show how the idea can be carried out, rather than to give a full outline of the course which could be presented.

The amount of details given is not uniform; sometimes more and sometimes less is given. The object is to show the general character of the study taken up.

The references given at the end of each topic in chapter II are the ones that are assigned to the pupils. No pupil reads every reference, however.

CHAPTER II

THE TOPIC OF TRANSPORTATION IN DETAIL

PART I --- TRANSPORTATION IN GRADE VI

A brief outline of transportation in grade VI is here presented to give the reader an idea of what the pupils have studied before taking up the same topic in grade VII from another point of view. The purpose of the topic in grade VI is to give the pupils some ideas about the more important phases of transportation and its facilities, at the present time. Grade VII then takes up the same topic to find out what methods of transportation were used in the past. The topic begins with a study to show the need for transportation. The following four questions are considered:

1. Where are raw products secured?

By using maps, the location of hunting, fishing, lumbering, mining and farming centers are carefully noted. (To quite an extent this is a review of work done in grade V, though for quite another purpose).

2. Where are these raw materials prepared for use, or for market? (See directions under no. 1)

3. Where are these raw and manufactured articles used?

4. What things need to be transported, and where? (It is easily seen how no. 4 grows out of the first three questions).

The following studies are then made:

1. Animal power as a means of transportation.
 - a. The common example of moving the pen over the paper.
 - b. The number, speed, strength and endurance of the animals used in this vicinity.
 - c. The structure, uses and advantages of the vehicles used in this vicinity.
 - d. The same points in connection with the animals and vehicles used elsewhere.
 - e. The influence of good and bad roads.
2. Steam railway.
 - a. Principle of the working of the engine; drawings of different parts of the engine; comparison with horse power; cost of operation.
 - b. Vehicles drawn by engines; structure, weight, capacity, etc. of the various cars.
 - c. Roads and routes used; including location of roads, ballast, bed, ties, etc.
 - d. Managing of the traffic: switch; block system; rates of speed; duties of train crew; passenger and freight rates; standard time and its method of reckoning.
3. Electric car and automobile.

- a. Simple experiments with electricity.
- b. Study of the motor and dynamo, showing how electricity moves cars.
- c. Study of the principle of the operation of the automobile.

4. Water-ways.

a. General principles.

- 1) The rowboat and the principle of the lever, applying it to rowing.
- 2) Construction of boats: rudder, keel, propeller, pilot house, ~~bow~~, stern, etc.
- 3) Principles of the operation of boats; experiments for displacement.
- 4) Managing of boats: duties of the ship's crew; signaling; harbor guides.

b. Ocean travel: size, speed, routes, etc. of ocean steamers; longitude and time; international date line; compass, etc.

c. Inland water-ways.

- 1) Location of navigable rivers; length; cities connected.
- 2) The Great Lakes and their traffic.

d. Canals: location and service rendered; shape of canal boats, size, power, and speed; locks and their principle.

5. Airships: principle of operation; different kinds and sizes.

PART II --- TRANSPORTATION IN GRADE VII

INTRODUCTION

The topic of transportation is given here in detail to show how a particular study is developed. This topic is intended to give glimpses of some means of transportation used in the past and to show how some of our modern methods of transportation have developed. It is not intended in the least to be called a history of transportation. The facts are not necessarily given in chronological order. The plan followed is to begin with the present and then give the facts of the past as they are called for. In this way we can begin with the things actually around the pupils, in which they feel more interest, rather than back in history, which, in the beginning of any study, naturally appears very foreign to them. It is only by having the problems of the present in mind that we can understand the facts of the past as they are related to the present. The purpose of history is usually given as a study of past conditions in order to understand the present. The position is here taken, however, that before studying the past, we must study the present to some extent, to see what the problems of the present really are. It is only by understanding this, that we can see any relation between the past and the present. After understanding our rapid

and efficient methods of modern transportation, we can appreciate the ancient methods. The purpose of this particular topic, then, is twofold; first, to give the pupils some definite ideas of how transportation was carried on in the past and second, how some of the early methods developed into the modern.

The sub-topics need not necessarily be given in the order here presented. In general, immediacy to the pupils' interests decide which is taken up first. The interests of the pupils are usually found in the things closely at hand. In response to a vote of the class, the automobile was ^{the} first topic considered.

OUTLINE

Table of General Sub-Topics

1. Automobiles
2. Railroads
3. Street Railroads
4. Aeroplanes
5. General Transportation on Land
6. Steamships
7. General Transportation on Water

"HORSELESS CARRIAGES"(AUTOMOBILES)

1. In America.

- a. Earliest record: in 1855 Dudgeon invented one in New York City; always drew a crowd; destroyed by fire, but another built in 1860.
 - 1) Description: bench on each side; accomodated ten passengers; carried fuel and water; had a smokestack like a modern locomotive; wheels were solid cedar wood.
- b. Motive power: steam, electricity, and gasoline.
 - 1) Comparison of advantages.

2. In France; very first attempt made.

- a. Cugnot invented a steam wagon in 1770; now on exhibition in Paris.
- b. Another invented in 1780; French Revolution (1) turned interest away.

(1) In considering this the pupils should get ~~a clear~~ ^{some} conception of the meaning of the French Revolution.

3. In England.

- a. Demonstration of a steam wagon made before the House of Commons in 1834; rate of travel, 35 miles an hour; much opposition by the owners of omnibuses and coaches; automobile enthusiasts stoned; era of railroad building caused interest to decrease.

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Cochrance, C.H.- Wonders of Modern Mechanism,

pp. 136-150, Horseless Carriages.

Doubleday, R.- Stories of Inventors,

pp. 69-71, Automobiles.

White, J.- The World's Progress,

pp. 264-267, The Automobile and its development.

RAILROADS

(1)

1. Table of growth of U. S. railways.

<u>Year</u>	<u>Miles</u>	<u>Per.Cent.of Increase.</u>
1830	23	
1840	2,818	
1850	9,021	
1860	30,635	
1870	52,914	
1880	93,296	
1890	163,597	
1900	193,346	
1910	240,438	

(Note: This represents a type of comparative study. Similar comparisons may be made on the cost of passenger and freight traffic, the rates of speed, the number of cars used, etc. at different periods).

(1) The pupils are to fill in the third column of the table.

2. Early 19th century railway development.

a. Early trunk lines: very short; little cooperation.

- 1) Union of various roads; the cause of our modern great trunk lines; government aid and its importance.

b. Early inventions in the U. S.

- 1) The first road locomotive; built by Evans, at Philadelphia; did not run on tracks.
- 2) First railroad locomotive in the ^{United States} U. S.; 1802; not a commercial success.

c. Early inventions in England.

- 1) Unsuccessful attempts as in the U. S.
- 2) George Stephenson and the commercially successful locomotive in 1829: called the "Rocket"; speed with a load, 16 to 20 miles an hour. Comparison with the Twentieth Century Limited between Chicago and New York whose time is 18 hours and distance, 908 miles.

d. Peter Cooper's locomotive: first railroad locomotive built in the U.S; 1830; first one used for carrying passengers; first one adapted to curved tracks.

e. Other attempts at moving loads on tracks; use of horse and sails; steam survived all.

f. First railroad construction in the U. S.

- 1) The first one was used in connection with the Bunker Hill Monument, 1826.
- 2) First freight road: from coal mines of Manch Chunk, Pennsylvania to the Lehigh River;

material purchased from England.

- 3) Baltimore and Ohio railroad, 1828;
first railroad charter; horses served
as motive power at first.

g. Early passenger coaches: merely stage coaches on wheels that would run on tracks; engineer collected the fare; the fireman cared for the baggage and freight.

3. Earliest records of the railway: Egyptian and Roman; used to haul large blocks of stone; we know little of their operation.

4. Beginning of the modern railway; in coal mines; rails and ties out of timber.

a. Motive power.

- 1) The horse.

- 2) Ropes and pulleys in mines on hillsides; as the loaded car went down it pulled the empty one up.

- 3) Stationary engines; a rope winding around a cylinder moved the car.

5. The steam wagon; invented by Cugnot, a Frenchman, in 1770; ran on the ordinary road; was the forerunner of the automobile as well as the locomotive; similar to the inventions of Evans given under 2b.

6. Comparison of the modern with the early railroads.

a. Conveniences, comfort, and safety.

b. The effect of the use of the telegraph.

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STREET RAILROADS

1. Table of growth of mileage in *United States*

Year	Miles
1890	2,462 (includes cable)
1900	21,920
1910	40,000

2. Edison: his many inventions made the use of electricity practical; built the first practical railway in the U. S., in 1880; used no wires; the current was transferred by the two rails.
3. The first electric railway: the Union Passenger Railway of Richmond, Va. built in 1887.
4. Early attempts.
 - a. The first attempt at moving cars by electricity was made in 1835; experiment not completed.
 - b. Invention of Professor Page of the Smithsonian Institution in 1851; constructed a 16 horse power locomotive that went at a speed of 19 miles and hour; compare with present speed; electricity generated by batteries; commercially not successful.
 - c. The electric railway of Dr. Siemens: exhibited in Berlin 1789; very small; ran upon a circular track 1000 ft. long; called "Siemens' electrical merry-go-round"; third rail took the place of a trolley wire.

5. Motive power, other than electrical, used for street railways.
 - a. Use of horses and mules.
 - b. Use of cables operated by steam; first one used in San Francisco, in 1873.
6. Effect of the street railway on cities: business is congested, people live quite a distance from their work, etc.
7. Effect of the interurban upon the rural districts.

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AEROPLANES

Exp P

(1)

1. Distance and endurance flights.

Aviator	Distance Miles	Time Hrs.Min.	Rate Per.Hr.	Place	Date
Paulham	108	2 3		France	Apr 18, 1910
Curtis	150	2 50		Albany, N.Y.	May 29, 1910
Hirth	330	5 41		Munich to Berlin	June 29, 1911
Atwood	462	17 12		Boston to Washington	June , 1911
Atwood	1266	28 53		St.Louis to New York	Aug 14-25, 1911

2. Modern development.

a. In 1796 Sir George Cayley suggested the first modern aeroplane; made no model because he had no machinery; is important for the idea.

b. In 1846 Hensen and Stringfellow put Cayley's ideas to machinery.

1) Description: was a monoplane made of oiled silk stretched over bamboo; a car under the frame carried the machinery and passengers; had two propellers and a fan shaped tail with a rudder; flew a short distance but was unstable.

(1) Maule- The Boys' Book of New Inventions.

pp. 76.

The pupils are to work out the column "rate per hour!"

- c. Interest increased and books were written; a book written by Lilenthal in 1886 inspired the Wright^lbrothers.
- d. A large aeroplane was built in 1893 by Maxim.
 - 1) Description: weighed 7500 pounds; 104 feet long; driven by ~~by~~a 360 horse power engine; was very crude and cumbersome; rose a trifle but came down with a crash.
- e. Langley worked about the same time; was not successful but made many important discoveries.
- f. Significance of the work of these men: instead of meeting with success they showed what not to do.

3. Early attempts at flying.

- a. Greek myths tell of them.
- b. A Grecian is supposed to have invented a dove of wood propelled by heated air. Significance: shows that they were thinking about aviation.
- c. The flight of "Simon the Magician" in 67 A. D; was a public flight; ended in the first "smash-up" on record.
- d. The flight of a Benedictine monk in the 11th century; built a pair of wings, jumped from a high tower and ~~and~~ sailed 125 feet.
- e. In the Middle Ages, ^lOiver of Malmesbury built a glider that soared 370 feet.
- f. General plan of these attempts: was modeled after birds' wings.

4. The kite and balloon.
 - a. Used in China in time of war as early as 300 B.C.
 - b. Records show that they were used in the coronation of Fo Kien in 1306.
 - c. An important modern historical reference: Benjamin Franklin and the kite.

5. The fifteenth century the most active time in aeronautics before our time; many inventions made; failed because they lacked our modern machinery.
 - a. Leonardo da Vinci studied birds extensively to find out ^{how} their wings worked.
 - b. The glider of ~~Battista~~ Dante in 1456 sailed 800 feet.
 - c. Interest decreased for five centuries, until our present time.

References

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pp. 173-188, Air-ships.
- Chamberlain, J.F.-How We Travel,
pp. 182-187, Traveling thru the air.
- Cochrane, C.H. - Wonders of Modern Machinery,
pp. 127-136, Flying Machines.
- Collins, F. A. - The Boys' Book of Model Aeroplanes,
pp. 163-308, History of Aviation.
- Maule, H. E. - The Boys' Book of New Inventions,

Mowry, W. A. & A. M. - American Inventions & Inventors,
pp. 294-297, Aviation.

White, J. - The World's Progress,
pp. 257-260, Air-ships a success.

(1)

GENERAL TRANSPORTATION ON LAND

1. Brief consideration of the present discussion for better roads over the country.
 - a. Some incentives for better roads.
 - 1) Increased demand for farm products.
 - 2) Appeals of "Good Roads" advocates.
 - 3) The use of bicycles and automobiles.
 - 4) "R. F. D."
 - 5) The work of the Department of Agriculture at Washington, D. C.
2. Compare American with European roads.
3. The Cumberland road.
 - a. Builder: ^{United States} as a nation.
 - b. Beginning: 1806.
 - c. Location: Cumberland on the Potomac to the Ohio river and thence to Vandalia, Ill.
 - d. Reason for not extending it further: era of railroad building came on.
4. Early transportation in America.
 - a. The colonists found America covered with Indian trails; difficulty in following them.
 - b. Indian trails formed the connections between the East and West.

(1)- This topic covers the period previous to the modern inventions as railroads, automobiles, etc. or from earliest times to about 1825 A. D.

c. The Old Connecticut Path.

- 1) Location: from Boston west to the Hudson river at Albany.
- 2) Importance: the Boston and Albany Railroad follows it very closely; at an early date it was made a public highway in *Massachusetts*.

d. The Iroquois trail.

- 1) Location: from the Hudson river to the Niagara.
- 2) Importance: the New York Central Railroad follows this trail.

e. The Lake Shore Trail.

- 1) Location: Across Ohio along the route now followed by the Lake Shore and Michigan Southern Railway.

f. In general, then, the lines of transportation followed the Indian trails in the East.

g. In the West the roads followed the section lines of the "Government Land Survey".

- 1) Purpose and the meaning of this survey.
- 2) Diagram and explanation of the different parts of the sections.

See Andrews- New Manual of the Constitution,
p. 348.

h. Colonial means of travel: on foot, on horse-back, ~~by chaise~~ and by stagecoach. The first stagecoach route established was from Philadelphia to New York, in 1756; the trip required three days (distance 90 miles);

time between these two cities at present:

1 hr. 48 min. on the Pa. R.R.

i. Washington's trip from Mt. Vernon to New York to be inaugurated was on horseback.

Time of trip: seven days.

j. The first turnpike road, 1794.

1) Location: Philadelphia to Lancaster, Pa.

2) Length: 66 miles.

3) Building and maintenance: built by a private corporation; maintained by collecting tolls.

k. Mail routes about 1795.

1) From New York to Boston. Time: three days.

Distance :263 miles. Present time:

2) From New York to Philadelphia. Time: two days.

Present time:

l. Establishment of lines of freight wagons after the war of 1812; ran on schedule time as railroads do at present.

m. Trails of Conistoga wagons; followed the best available roads and were ferried across large streams.

1) Boston-Baltimore route. Time:26 days. Present time:

2) Baltimore-Richmond route. Time: 10 days.

Present time:

n. The Prairie Schooner and the settlement of the West.

s top

- o. Comparative table showing the time of travel between certain cities, in our early period and at present. (This summarizes what has been given above)

Cities	Early Time	Present Time	% of decrease in time.
New York to Boston	3 days		
New York to Philadelphia	2 days		
Boston to Baltimore	26 days		
Baltimore to Richmond	10 days		

fruit

The pupils are to work out the last column.

5. Macadamized roads; first built by Macadam in England in 1816; found throughout Europe, and to some extent in America.
 - a. Advantages: are constructed so they are not affected by rain and snow. A horse can pull three or four times as much on one of these as on an ordinary dirt road.
6. The first European toll road. Date: 1346. This revived good road building as interest had passed away since the decay of Rome.
7. Roman roads and carriages.

a. The roads were as straight and substantial as possible; some are over 2000 years old. Examination of a cross-section of a Roman road.

b. The Appian Way.

1) Location: Rome to Brandisium.

2) When begun: 312 B. C.

3) Length: 350 miles.

4) Importance: as parts of it still remain it shows how substantial the roads were; the Apostle Paul entered Rome over this road.

c. Roman carriages: carpentum, reda, and cistium.

6 f. The very earliest roads and carriages.

a. The first roads were merely foot-paths or trails; are as old as the human race; followed the lines of least resistance; streams were bridged with fallen trees or were forded; ancient Egyptians began road improvement very early.

b. Early vehicles: sledge is the earliest known; some times it had rollers; later, wheels were made out of cross-sections of logs; was the forerunner of the Egyptian and Roman chariots; the Roman chariot races.

9. Beasts of burden.

a. Man did the first carrying or toting himself; man can carry about 75 pounds 12 miles a day.

- b. Water and food were probably first transported; pitcher with head pad used.
- c. Devices to aid man in carrying: yoke, neck strap, and frame, shoulder pole, basket, porters knot, knap-sack, and Sedan chair.
- d. Methods of carrying babies.
 - 1) Indian: on back.
 - 2) Russian: in a basket cradle.
 - 3) Japanese: supported on the carriers' hips or shoulders.
- e. Pack animals; man early began to transfer the load to animals.
 - 1) The elephant.
 - a) Where used: in the Orient.
 - b) His ability to carry: 1800 to 2500 pounds.
 - 2) The camel.
 - a) Where used: in the desert.
 - b) Why adapted: feet do not sink in sand; not affected by heat; can go a long time without water.
 - c) Ability to carry: three times as much as a horse, with equal speed.
 - d) Called the palace car of the desert.
 - e) Biblical reference: selling Joseph into Egypt, Genesis Ch.38, V.28.
 - 3) The llama.
 - a) Where used: in South America.
 - b) Why adapted: can climb mountains.

c) Ability to carry: 50 to 200 pounds.

4) The burro.

a) Where used: Mexico, Europe, Western Asia and Rocky Mountains.

b) Why adapted: sure footed and faithful.

c) Biblical references.

(1) Story of the Good Samaritan; Luke X,30-36.

(2) Escape of Jesus to Egypt; Matthew II,13-16.

5) The dog.

a) Where used: Polar regions, Holland, Belgium, and Norway.

6) The horse.

a) Where used: in all temperate regions.

b) Used as a draft animal since the age of chivalry. (Nothing further is taken up on the horse as this comes in the sixth grade).

7) Some historical references where beasts of burden were used.

a) Hannibal crossing the Alps; elephants.

b) The Crusades; horses.

10. Peculiar devices to aid man. Besides shifting the loads to beasts of burden, man invented many devices to assist in transportation.

a. Carrying water in hollow bamboo stalks in the far East.

b. Raw hide rope bridges in India: one end is higher than the other, and the load slides across the stream.

1)- The content under numbers 9 and 10 applies to the present in some localities of the world, as well as to the past.

- c. The Elka in India: a two wheeled cart for carrying passengers and baggage; the passenger sits in the cart and the driver on the horse.
- d. The jinrickisha in Japan: two wheeled carriage for one or two persons; drawn by man.
- e. The passenger wheelbarrow in China: must contain two passengers in order to balance it; pushed by man.
- f. Street railway in Mombassa, Africa: each car contains one passenger and is pushed by man; has four wheels and runs on a track.

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pp. 1-13 Boston and the Bershires,
pp. 63-73 Old journeys from Philadelphia to the West,
pp. 86-97 The National Road.
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pp. 55-130 Travel in various parts of the world.
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pp. 278-287 Travel.
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and the Pacific R.R. -

- McMaster, J.B.
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 Morris, C.
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 pp. 161-169
 ✓ Mowry, W.A. & A.M.
 pp. 187-193
 pp. 200-206
 ✓ Rocheleau, W.F.
 pp. 5-49
 The Outlook for Oct. 28, 1908.
 ✓ Wilkinson, J.W.
 p. 271
 Additional reading on
- School History of the U.S.,
 Travel and life in the early days.
 Industrial and Commercial Geography,
 Methods of transportation,
 On land.
 Home Life in All Lands,
 Primitive roads and bridges,
 Modes of land travel.
 American Inventions and Inventors,
 Travel by land,
 Stage Coaches.
 Great American Industries,
 Transportation,
 On land.
 Camel trails by C. W. Furlong.
 Practical Agriculture,
 Macadam roads.
 Hannibal over the Alps,
 Roman roads, and
 The Crusades should be done.
 These can be found by referring
 to the index of the proper histories.

STEAMSHIPS

1. Description of modern ships as found in Rocheleau-Great American Industries, Fourth Book-Transportation, pp. 77-79, and Chamberlain-How We Travel, pp. 165-170.
2. Establishment of trans-Atlantic lines.
 - a. The first line: "The Great Western Steamship Co.", 1838. The first trip required 26 days. Present time: 5-6 days. Determine what percent the time has been reduced.
 - b. Great modern lines.
 - 1) Names.
 - 2) Date of establishment.
3. Comparison of advantages of steam over sailing ships.
4. *Fulton and the steamboat.*
 - a. Why Fulton is credited with the invention; although his was not the first attempt, it was the first to be commercially successful.
 - b. His invention: the Clermont.
 - 1) Description.
 - 2) First trip; New York to Albany, Aug 4, 1807; 150 miles in 32 hrs; rate per hour; comparison with present rate.
 - 3) Importance of: marks an important epoch in the history of commerce and transportation.
 - 4) Criticism at the time.
 - c. Attempts before Fulton.
 - 1) The use of the paddle wheel by the Romans; slaves used to operate them.

- 2) The problem: to obtain power other than human power to operate paddle wheels.
 - 3) Howell of England built a steamboat in 1736 to be used for towing.
 - 4) Rumsey operated one on the Potomac in 1786.
Rate: 4 miles per hr. Power: a jet of water forced out at the stern by means of a pump which was operated by a steam engine.
 - 5) Fitch operated one on the Delaware river in 1786. Rate: 7-1/2 miles an hour; propelled by paddles operated by an engine; very complicated.
 - 6) General shortcoming: too complicated for commercial use.
5. Stevens and the steamboat, 1807.
 - a. Importance: demonstrated that it could be used upon the ocean. First trip: New York to the Delaware river.
 6. First Steamer on the Great Lakes: on Lake Erie in 1818.
 7. First steamship in Europe: "Comet" on the Clyde in Scotland, 1812.
 8. The Savannah.
 - a. Importance: the first one to cross the ocean, Date: 1819.
 - b. Description: built in New York for a sailing ship; fitted at Savannah for a steamship.
 - c. The trip: used both sails and steam; the trip was made from Savannah to Liverpool May 26-June 20, 1819

(25 days). Fuel: pine wood.

9. The paddle wheel: used exclusively for 30 years after Fultons' time; could not be used entirely successfully on the ocean, however; reason.
10. Perfection of the screw propeller by Ericsson, 1840-1845; advantage.
11. Modern improvements.
 - a. Greater power for the fuel consumed.
 - b. Use of *coal* /? steel instead of wood.
 - c. Devices for greater safety and comfort. Example: wireless telegraphy.
12. Comparative table of rates of speed.

Great modern ships	30	mile per hour
Fulton's Clermont	4-11/16	" " "
Rumsey's boat on the Potomac	4	" " "
Fitch's boat on the Delaware	7-1/2	" " "

Comparison of these various rates with that between N.Y. and Liverpool.

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| ✓ Chamberlain, J.F. | How We Travel, |
| pp. 161-181 | Steamships. |
| ✓ Champlin, J.D. | Cyclopedia of Common Things, |
| pp. 782-784 | Steampship. |
| ✓ Champlin, J.D. | Cyclopedia of Person & |
| | Places, |
| pp. 319-329 | Fulton. |

(1)
GENERAL TRANSPORTATION ON WATER

1. Transportation upon the ocean.
 - a. Phoenicia: first to make extensive use of the sea for commerce.
 - b. Greece and Rome: had warships before commercial ships; very similar; sometimes used interchangeably.
 - c. Comparison of these ancient with modern ships: the former clumsy and slow.
 - d. Motive power: rowing and sailing.
 - e. Early records: sailing vessels shown on Egyptian monuments; discovery of a sailing vessel of a date not later than 3000 B.C: Genesis VI, 14-16, Noah's Ark.
 - f. Navigation neglected after the downfall of Rome, for centuries; transportation carried on early only on the Mediterranean and on the coast of Western Europe, for 1000 years after Christ.
 - g. Norsemen's visit to America, 1000 A.D.
 - h. Trade between the Orient and Europe; search for a shorter route; reasons.
 - i. Columbus and his discovery of America, 1492; his ships typical of the 15th century.
 - j. Trade between America and Europe; started soon after the discovery.
 - 1) Shipbuilding in America.
 - 2) Advantages of American ships: more strength, speed and space.

1)- This topic covers the period previous to the invention of the steamboat, or from earliest times to about 1812.

- 3) War of 1812, effect upon shipbuilding.
 - 4) Establishment of packet ship routes:
 first line between Liverpool and New York,
 1816; sixty-three days for the round trip;
 distance 3540 miles; carried freight, mail and
 passengers; became a steamship line later;
 steamship rate:-- percent of decrease in time.
 - k. Voyage of Savannah, 1819, used both steam and sails;
 route terminated at Savannah and Liverpool.
 Importance: first steamer to cross the ocean.
2. Inland transportation. People living near streams always have some means of water transportation.
- a. Simplest boat: log.
 - b. Raft: made of logs.
 - c. Dugout: large log hollowed out by stone and fire.
 - d. Canoe: usually made of bark; Indians excelled in its use; French used them extensively in explorations.
- 1) Use of, today: in different localities;
 extensively in pleasure resorts; by barbarous tribes.

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- | | |
|-------------------|-----------------------------|
| Chamberlain, J.F. | How We Travel, |
| pp. 140-160 | Traveling on the water. |
| Johnson, E.R. | Elements of Transportation, |
| pp. 201-206 | The sailing vessel. |
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- pp. 13-25
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- pp. 194-199
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- pp. 50-65
Webster, W.C.
- pp. 1-34
- Transportation,
The sailing vessel.
Industrial and Commercial
Geography,
On Water,
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The boat and the ship.
American Inventions and
Inventors,
By water.
Great American Industries,
Transportation,
Waterways: introduction and
and sailing vessels.
A General History of Commerce,
Ancient commerce. (omit sections
1, 2, 3, 5, 7, 14, 15, 19, 20 & 28.)

CHAPTER III

GENERAL OUTLINE OF GRADE VII

The purpose of this section is to give some idea of how the other topics in grade VII are developed. No attempt at completeness is made. Each topic is outlined in a general way and a few suggestions given to show the trend of the development. It might be said here that before beginning the study of these topics the work of grades V and VI is reviewed to get the problems clearly before the pupils. For example, before studying manufacturing in the light of the past, the present condition of manufacturing as studied in grade VI, is reviewed. Then by having the problems of the present in mind, it can more easily be seen how the past contributed to the present.

FARMING

1. In the American Colonies.
 - a. Among the early settlers.
 - 1) Farming among the Indians;
tools and methods; influence on the colonists.
 - 2) Colonists' methods and tools.
 - 3) Difficulties met with.
2. Development after the formation of the nation.
 - a. New implements and inventions by 1800: improved plow, seed-sowers, drills, etc.
 - b. Mowers and reapers about 1830.
 - 1) Inventions of Manning and Hussey.
 - 2) Comparison with earlier methods.
 - c. McCormick and his harvester.
 - d. Threshing machine.
 - e. General introduction of labor saving machinery.
 - f. Improved methods of cultivation.
 - g. General improvement in condition of farm life.
 - h. Comparative study of increased amount and value of farm crops, land, etc.
3. Among the Ancients.
 - a. Methods used by the Egyptians, Greeks, etc;
influence of tradition and superstition.
 - 1) Sowing by hand.
 - 2) Reaping with a sickle.
 - 3) Threshing by tramping the grain.
 - b. Description of tools used; plow, sickle, etc.

- c. Grinding; use of mortars and rude millstones.
4. Mediaeval farming.
- a. Differed little from Ancient times.
 - b. Description of tools and methods when different from Ancient Days.
 - c. Feudalism and method of holding land.
 - d. General life of the peasants.

MANUFACTURING

1. Textile manufacturing.

a. Wool.

- 1) First records.
- 2) Early methods; household industry.
- 3) Modern inventions and their effects; spinning jenny, power loom, etc.
- 4) Introduction of improved machinery and factories in America.
- 5) Laws and regulations concerning the wool industry; Schedule K.

bt. Silk.

- 1) First record.
- 2) Position of China in early silk culture.
- 3) Introduction into Europe.
- 4) Use of silk confined to church and nobility for centuries.
- 5) A hand industry until about 1800.
- 6) Inventions; Jacquard, etc.
- 7) Silk culture in America.
 - a) Introduced 1622.
 - b) Increase in the industry.

c. Linen.

- 1) Early records: Ancient literature, Bible, Mediaeval European records.
- 2) Household industry; implements used.
- 3) A factory industry after 1812.
- 4) Ireland important since 1333.
- 5)

- 5) Development in the U. S.
- d. Cotton.
- 1) Great increase in the 19th Century.
 - 2) Early records; Herodotus, Chinese.
 - 3) Cotton in India.
 - 4) Discovery of cotton in America; of little value because of difficulty in preparation.
 - 5) The age of inventions; influence of the cotton industry.
 - 6) Changes in methods of manufacturing; from a household to a factory industry.
 - 7) Cotton surpassing all other textiles in use.
 - 8) Comparative studies of amount produced, value, etc.
2. Iron manufacturing.
- a. Implements and tools used by people in early stages of civilization; consideration of the stone and bronze ages.
 - b. Early records of iron: Bible, Egypt, China, Rome, etc.
 - c. American records.
 - 1) Probably unknown to the Indians.
 - 2) Discovered in N.C. in 1608.
 - d. Development of the iron industry in the U.S.; general concentration; influence of location of coal; numerous inventions.
 - e. Comparative study of output.
 - f. Smelting or preparation of iron.
 - 1) Among the Ancients; practically no equipment.

- 2) Introduction of Persian furnaces.
- 3) Development of the modern furnaces.
- 4) Making steel.

3. Glass.

- a. Early records; story of Pliny regarding the Phoenician discovery of glass; found in ruins of Pompeii and Herculaneum.
- b. Little used during Mediaeval Ages.
- c. Greased paper instead of glass for windows in the American Colonies.
- d. General development and increase in glass manufacture during 19th Century.

4. Pottery.

- a. An Ancient Art; found among the savages.
- b. Hand industry among the early peoples; artistic designs.
- c. General methods of making.
- d. Modern glazing, painting, etc.

GOVERNMENT

(1)

1. Present forms of government.
 - a. Local government in Columbia.
 - b. State government in *Missouri*.
 - c. National government in the *United States*.
 - d. " " in England.
 - e. " " in France.
 - f. " " in Germany.
 - g. International law; Hague.
2. Forms of government in the past.
 - a. Early local government in America.
 - 1) Township ~~form~~ in the New England colonies.
 - 2) County form in the South.
 - 3) Township-county form in the the middle colonies.
 - 4) Nature of local government in the western states.
 - b. Early colonial and state government in America.
 - 1) Legislatures usually bi-cameral.
 - 2) Change from appointive to elective officers.
 - 3) Change from colonial to state governments; constitutional conventions and constitution.

(1) As was stated in chapter I, the present forms of government were also given in grade VII during 1912-1913. This is an exception to the rule and may not be permanent.

c. Early national government in America.

- 1) Albany plan of union, 1754.
- 2) Stamp Act Congress, 1765.
- 3) First Continental Congress, 1774.
- 4) Second " " , 1775-1781.
- 5) Articles of Confederation; chief characteristics and defects.
- 6) Making the present constitution.
 - a) The convention and its purpose.
 - b) Relation of national to state governments.
 - c) Question of representation in Upper and Lower House; result.
 - d) Ratification.
 - e) Amendments.
 - f) General characteristics of the constitution.

d. Early characteristics of national government in England.

- 1) During the Saxon period.
- 2) " " Norman period.
- 3) " " later period.
 - a) Judicial reforms: grand juries; trial by jury.
 - b) The Great charter.
 - c) House of Commons.
 - d) Absolutism of the Tudors.
 - e) Divine Right of Kings.



- f) Petition of Right, 1628.
 - g) Bill of Rights, 1689.
 - h) Union of England and Scotland, 1707.
 - i) " " " " Ireland, 1800.
 - j) Parliamentary representation and reforms between 1832 and 1884.
- e. The chief governmental characteristics of the nations of the Ancient East, Greece and Rome.
- f. Government among the tribes in earlier stages of civilization.
- 1) The Germanic tribes.
 - 2) The American Indians.
 - 3) Inesavage lands.

GOVERNMENT ACTIVITIES

1. The army.
 - a. Comparative table showing the increase of the U. S. army since 1789.
 - b. Organization and effectiveness of the army(1) during the American Colonial and Revolutionary period, (2) during the Civil War period.
 - c. Egyptian army; organization and equipment.
 - d. Grecian " " " " ; phalanx; rewards; Spartan military education.
 - e. Roman army; organization and equipment; legion; military roads.
 - f. Army of the Germanic tribes; organization and equipment; bravery.
 - g. Feudal armies; organization and equipment; orders of knights; the crusaders.
 - h. English army; general development during the Anglo-Saxon and Norman periods; battle of Crecy and Hundred Years' War; English archers and French cross-bowmen; use of cannon to scare horses; heraldry; general downfall of feudalism after use of gunpowder.
 - i. Development of means of fighting during Modern Age.
 - 1) Various guns: matchlock; wheellock; flintlock; muzzle loader; and breechloader.
 - 2) Artillery.
 - a) Hurling machines and battering rams among Ancients.

- b) First cannon at battle of Crecy.
- c) Modern development in lightness, durability, etc.

2. The navy.

- a. Development of the American navy during the War of 1812, Civil War, Spanish War and since.
- b. First record of navies: Egyptian accounts,
- c. Phoenicians the greatest sailors of antiquity.
- d. Early method of fighting: dashing ships together and fighting hand to hand as on land.
- e. Rome; control of the seas at the Battle of Actium, 31 B. C.
- f. Mediterranean Sea the scene of naval struggles to the 15th Century.
- g. Change of scene during the age of discovery.
- h. England: Alfred the Great, "father of the English navy", one of the leading sea-powers since 1500.
- i. Motive power of ships.
 - 1) Rowing.
 - 2) Sailing.
 - 3) Steam.
 - 4) Comparison of advantages, and influence on methods of fighting.

3. The postoffice.

- a. Early records: Assyrian and Persian couriers; Roman "positum."
- b. In England; royal messengers from early times.

- 1) Government monopoly by James I.
 - 2) Beginning of city delivery, 1680.
 - 3) General condition of service: rates high, irregular, etc.
 - 4) Changes by Sir Rowland Hill, 1837: uniform postage, advance payment, invention of postage stamp, etc.
- c. In the American Colonies: beginning and general condition of the service; Franklin, postmaster general in 1753.
- d. In the ^{red} ~~U.S.~~ States.
- 1) Development in the methods of carrying mail.
 - 2) Development and changes in stamps and rates of postage.
 - 3) Postal savings.
 - 4) Development of rural and free delivery.
 - 5) Parcels post.
 - 6) Comparative study of number of offices in relation to population.
4. Government finances.
- a. A study of revenue and expenditures of the leading nations for a certain number of years.
 - b. Comparison of population and finances, to show per capita revenue and expenditures, for certain years.

c. Type table.

(1)

Table of U. S. revenues for 1911.

Sources	Amount	o/o of total
Customs	\$314,497,071	
Internal revenue	322,529,200	
Sales of public lands	5,731,636	
Profits on coinage, etc.	5,272,348	
Revenue of D.C.	7,086,080	
Sales of Indian lands	7,463,516	
Immigration fund	3,669,816	
Other sources	32,123,707	
Total		

(1) From Statesmans Yearbook for 1912, page 378.

(1)
MANNERS AND CUSTOMS

1. The American Indians.
 - a. Houses and furniture.
 - b. Cooking utensils; food.
 - c. Tools and weapons.
 - d. Dress.
 - e. Duties of both men and women.
 - f. Communication; sign language; picture writing.
 - g. Money; wampum.
2. American colonies.
 - a, b, c, and d, same as under no. 1.
 - e. Special table manners and rules.
 - f. New England Sunday.
 - g. Southern hospitality.
 - h. Slavery.
 - i. Plantation life.
 - j. Dutch life in the Middle Colonies.
 - k. Telling time without a clock.
3. Ancient Germanic tribes.
 - a. Importance of considering them.
 - b. Appearance and dress.
 - c. Duties of both men and women.
 - d. Food.
 - e. Weapons and tools.
 - f. Houses.

(1) This topic gives some of the interesting customs of earlier peoples as they differ from our present civilization.

4. Life of the village and town in the Mediaeval Ages.
5. Egypt.
6. Greece.
7. Rome.

(The following topics are considered under each country mentioned under 5-7.)

- a. Appearance of the people.
 - b. Dress.
 - c. Food; table manners; cooking utensils.
 - d. House and furniture.
8. Primitive tribes (This refers to tribes that existed in the past and to those that are now in primitive stages of civilization.)
 - a. Use of fire.
 - 1) Man's condition without fire.
 - 2) Methods of producing fire.
 - b. Food; how it is obtained and prepared.
 - c. Dress.
 - d. Use of animals.
 - e. Occupations: food-getting; basketry; pottery.
 - f. Utensils, weapons and tools; importance of stone; metal working.
 - g. Various forms of writing; picture writing; Egyptian hieroglyphics; Phoenician alphabet, etc.
 - i. Tales, traditions, and myths; influence of superstition.

TRANSPORTATION

This topic has been outlined in detail in chapter III.

Besides mentioning the following topics, nothing further will be said about them, as they have not been worked out to any great extent.

Recreation

Hunting

Fishing

Lumbering

Mining

Forms of Business

School Life of Other Nations Including that of
our Early Nation

CHAPTER IV

EVALUATION

It must be remembered that this scheme is not an attempt at correlation. Too many of these attempts are forced. Often arithmetical work is brought in because it can be, and not because it is needed. In this experiment the traditional curriculum was not considered at all when the subject-matter was outlined. By looking into the experiences of life it seems that the great industries as given above are the centers of activity. Therefore these ought to be the centers of school life. With this point in view they were put into grades V-VII of the University Elementary School. It must not be thought however that the facts of the "Three R's" have no place in this curriculum. In studying the great industries, these facts are normally used in carrying on the study. They are used merely as tools when called for; they are not put in when an opportunity arises to teach them for their own sake. The use of them, however, is inevitable in this kind of a study.

In the light of these facts, this chapter will attempt first, to point out very briefly how this traditional subject-matter is actually used in the seventh grade as outlined in the two previous chapters; and second, to indicate, to some extent, in terms of the formal public school subjects how much of this formal sub-

ject-matter is actually used.

Reading: A representative course in reading is Baldwin's Eight Leader, consisting of 233 pages. In this school the reading of literature is one of the "leisure" studies and is not done in connection with the industries. During the past year over 1300 pages from such works as Dickens' "Christmas Carol" and ~~Irving's~~ ^{Hawthorne's} "The Great Stone Face", were read; many short poems were also memorized.

Note: Compare this amount with the following quotation from Huey- "The Psychology and Pedagogy of Reading", p. 367. "The amount of time given to reading and the study of the English language through the spelling-book and the little grammar which are used in that school(an average Massachusetts Grammar School), and through a variety of other aids to the learning of English, is thirty-seven per cent of all school time during six years'. Yet he found by actual test that a high school graduate could read aloud at a moderate rate ' everything that the children in most of the rooms of that school have been supposed to read during their entire course of six years', in forty-six hours."

Besides this the pupils read, on an average, one library book of fiction in about two weeks. The following table shows how much of this was done by grade VII of 1911-'12.

Pupil	Number of books read	Number of pages (1)
1 (excused from extensive reading)	6	1475
2	19	6015
3	22	6821
4 (excused from extensive reading)	5	1022
5	24	7397
6	17	3753
7	20	5356
8 (did not attend the first two months)	17	5391
9 (entered the second semester)	6	2332

(1) This large amount does not, of course, indicate critical reading. This reading is done for the sake of the story, as an adult would do. It represents an amount and a kind of reading, however, which is usually not done by elementary school pupils.

Aside from this there is the general reading on the industries, which corresponds to the reading of history, physiology, etc. in other schools. The reading on this material amounts to about 160 pages on "Transportation" (see chapter II). This occupied about one month. This rate means over 1400 pages during the ~~year~~^{year} term. The writer has been convinced that these pupils read a great deal more and read with a more genuine spirit than we ordinarily find.

Writing: In most schools writing exercises are given for the purpose of learning to write. Nothing of this kind is done in this school. No special attention is given to writing as such. From the following two pages the reader can judge as to the pupils' ability to write.

These clippings are taken from the pupils' written work. The pupils were not asked to write them as samples of their handwriting. This writing is thus fairly representative of the work of this class where the pupils write only as their studies occasion writing. The reader is left to judge of its quality: he may use the Thorndike standards if he wishes.

1 | the women. The men preferred to hunt
2 | there were no sewers. If you walked the
3 | food they made out of milk. Their food
4 | after and a day in the town
5 | himself. They used spears and
6 | the city, for they will make you give
7 | shape. They use strings of it for money.
8 | no policemen but they have a city
9 | very active, and accomplished much.
10 | Mostly meat. They did not drink
11 | One reason why they were so
12 | and leave the town without hindrance

These clippings are from the pupils' writing when they have been asked to write their best, paying special attention to writing and not content. This is not normal in this school.

1 The maple strews the embers of its
2 Although a complete tale in itself this story
3 "Set it be," said Akes, thrusting his
4 The range lines and the town-
5 dumb animals, not only because
6 For the moon is in the keeping of the
7 Marley was dead to begin with. There is no
8 They all stood still, and gazed upon
9 Years rolled on and on. The hunter
10 fence and stood beside the negro.
11 Though the weather had been cold,
12 "I don't see how that can be," said Dick,

Arithmetic: The Southworth Stone Arithmetic,

book III, is a characteristic book on this subject completed by public schools. The following is a list of topics given in it.

- (1)
- b a 1. Notation
 - b a 2. Addition
 - b a 3. Subtraction
 - b a 4. Multiplication
 - b a 5. Division
 - b a 6. Use of signs
 - b a 7. Equations
 - 8. Ratio
 - b a 9. Denominate numbers
 - b a10. Fractions. L.C.M. and G.C.D.
 - b a11. " Addition
 - b a12. " Subtraction
 - b a13. " Multiplication
 - b a14. " Division
 - b a15. Decimals, notation
 - b a16. " Addition
 - b a17. " Subtraction
 - b a18. " Multiplication
 - b a19. " Division
 - b 20. Interest
 - b a21. Measurement, linear
 - b a22. " surface
 - b 23. " solids

(1) Taken from Mr. Horn's Master's Thesis referred to above.

- b a 24. Percentage
- b 25. Insurance
- b 26. Commission
- b 27. Promissory Notes
- 28. Commercial Discount
- 29. Partial Payments
- b a 30. Taxes
- 31. Compound Interest
- b 32. Bank Discount
- 33. Stocks
- a 34. Government Revenues
- 35. Bonds
- 36. Exchange
- 37. Bank Collections
- 38. Proportion
- 39. Involution and Evolution
- 40. Square Root
- 41. Cube Root
- b 42. Mensuration, curved surfaces
- 43. Similar surfaces
- b 44. Mensuration
- b 45. Longitude and time
- 46. Simple Algebra

The topics that are marked "a" represent the specific operations used in connection with the seventh grade work. It will be noticed that some of the very important ones have found no place. The work of grades V and VI, however, which consists of a greater variety of method, has used , in addition to those marked "a"

those indicated by "b". Considering the number of processes checked, it will be seen that practically all of the important ones have found a place. Suffice it to say that all of the problems have grown out of real needs and were solved to aid in understanding some particular fact that was under consideration.

Grammar, composition, and language: These are usually given as special subjects in public schools. They are carried on generally without special relation to other studies of the child. As with the other formal content subjects, they are carried on incidentally in this school. No special time is set apart for "grammar", and the technical terminology is not stressed. The chief grammatical and language study is carried on in discussing written reports on the industrial activities mentioned. These written reports represent the work in composition. No abstract compositions are written for the sake of giving an opportunity to express one's-self. These reports grow naturally out of the industrial study. The pupils feel a real purpose in writing them. As opposed to other schools, more time is here spent in actually expressing one's self than in studying abstract terminology. A test was carried on during the latter part of 1912-'13 to see how long it would take the pupils to acquire this terminology after being able to express themselves clearly in written form. This test covered class work amounting to 12 hours. The pupils were able to grasp the terminology in this time as satisfactorily.

if not more so, than we ordinarily find. If grammar is to help one express one's self more clearly it seems that a whole year's course as ordinarily given is not nearly as effective as the incidental scheme here described. The following tables showing the number of errors in grammatical and language construction and the amount of written work done, will surely indicate that more time should be spent in actual writing, growing out of normal experience, and less in studying forms and terminology.

The following table shows the number and kind of grammatical errors made by each pupil while writing the reports on "transportation" (see chap.II).

Grammatical error	Pupil												
	1	2	3	4	5	6	7	8	9	10	11	12	13 ⁽¹⁾
Incomplete sentence								5			1	1	
Disagreement of subject and verb in number	3	2		1		2		1	1	2			2
Wrong tense to agree with the preceeding		2		1	1	2		1					
Ommission of pronoun	1	1											
Ommission of verb	1	2					1	2					
Ommission of conjunction			1			2							
Ommission of object					1	1				1	1		
Ommission of preposition						1							
Number of pages written by each pupil.	22	25	22	15	15	23	11	22	22	17	18	17	

Note: These few errors do not seem to indicate that an extensive study of grammar as such is necessary.

(1) Pupil no.13 will not be considered as he came in late and for other reasons was not a normal case. (The Japanese student referred to in chapter I).

The following table shows the amount of written
(1)
work done on the industries during the year.

Pupil	(2) Number of Pages
1	132
2	137
3	121
4	105
5	121
6	138
7	104
8	131
9	137
10	109
11	130
12	114
13 (see note p. 77)	

(1) Aside from this each pupil must write a one page report on each library book read. The total average for the seventh grade in 1911-'12. was 18 pages. Therefore the total written work is larger than indicated in the table above.

(2) The paper used is the ordinary 10 R paper. The sheets are 8X10-1/2 inches containing 26 lines. There is a margin of 1-1/2 inches at the left.

Spelling: According to Mr. Horn's thesis referred to above, "Spelling" is given on an average about 54 minutes a week in the seventh grade. The following table shows the number of misspelled words found in the written reports on "transportation".

Pupil	Number of misspelled words	Number of pages in the report
1	2	22
2	18	25
3	7	22
4	19	15
5	37	15
6	7	23
7	44	11
8	28	22
9	4	22
10	20	17
11	16	18
12	20	17
13 (see note p.77)		

Note: The number of misspelled words here indicated does not represent the pupils' real ability to spell. They were taken from written reports and a great many were misspelled on account of carelessness rather than a lack of knowledge. The writer convinced himself of this by giving the words orally to the pupils and having them spell. Finally it might be said that the limited number of misspelled words in relation to the

number of pages written does not seem to indicate that the usual spelling lessons are worth while.

Geography: The occasions for making geographical study can best be seen by examining the outlines. The subject as given in texts ordinarily includes much that is not necessary. From the nature of its presentation it does not attract the pupil. When the facts are given incidentally in solving some problems, as in these outlines, the pupils feel a real reason for finding out certain geographical facts. A few examples will show how the facts are used. In studying the government of various nations as Greece, Rome, England, France, Germany, etc. these countries must be pointed out- to get an idea of their location. In studying the location of railroad and steamship routes their location as well as their terminals are carefully noted on the map. In studying the improvements in smelting in connection with manufacturing, made by the Persians these people must be located.. From this it can be seen that numerous references are necessary. It would be difficult to say how much of this geographical work is done as it is constantly called for.

History: While the amount of history studied in the seventh grade does not include as much American History as we ordinarily find, it covers a more general field. No period or section of history is given any preference. Any period is drawn upon when it is necessary. The actual number of Historical facts considered is quite large; in fact it should be remembered that the whole

seventh grade course is largely historical. The history is of an entirely different sort, however, from that of the traditional course. No special attention is paid to wars or political development, but life activities are considered. The following list of historical books, to which the pupils are referred, will indicate to some extent what kind of historical work is done.

1. Ancient histories, by such authors as Botsford, Morey, Myers, West, and Wolfson.
2. Mediaeval and Modern histories by such authors as Harding, Munro & Whitcomb, Myers, Schwiel, and West.
3. English histories by such authors as Cheney and Montgomery.
4. American histories by such authors as Eggleston, Fiske, Mace, McMaster, Morris, Scudder, and Sparks.

It must be remembered that the pupils read only certain parts of these as they are called for.

There are also numerous other kinds of histories that are read. These have nothing to do with political development. The following list shows a few of this kind.

Bogart, E.L.-Economic History of the U.S.

Coman, K. -Industrial History of the U.S.

Webster, W.C. General History of Commerce.

Wright, D.C.-Industrial Evolution of the U.S.

Civics: A great deal more is done on this topic than is usual in public schools. It is classed as one of the industries and is studied under the name of "Government". The topic begins with a study of local

government in Columbia and in Boone County and broadens out to include Missouri, as an example of state government, and finally the ^{United States} U. S. as a nation. After this is completed a brief study of the government of England, France, and Germany is also made. Certain comparisons, which are then made, give the pupils an idea of the chief forms of government. This study is then carried into the past and the American Articles of Confederation, the early government of England, and the government of Greece, Rome, and peoples in earlier stages of civilization, as the American Indians, are briefly considered. Thus the topic of "Civics" is given much more attention than we ordinarily find in the public schools.

Drawing: With the exception of a little art study done in connection with the leisure period as described in Chap. I, no drawing is done for its own sake. A great deal is carried on, however, for illustration. This is all freehand. For example, numerous drawings are made of the early and later vehicles used for transportation. The following table shows the number of drawings made by each pupil while studying "Transportation" (covering a period of 4 weeks).

Pupil	Number of drawings.
1	19
2	17
3	18
4	15
5	14
6	18
7	15
8	13
9	16
10	17
11	17
12	19
13	(see note P. 77)

So far the work of the seventh grade here presented has been discussed in terms of the traditional subjects. This is not a conclusive proof of the effectiveness of any curriculum, however, as there are other results which should be obtained and which may be even more important than the ones here indicated. These are certain traits as: initiative, self-direction, ability to handle books, etc., which the school should develop in the child. The ordinary school by its very "system" however, curbs many of these characteristics. To develop

these abilities is one of the chief purposes of this school.

Although not all of the content of the traditional subjects has a place in this work it is claimed that the really necessary parts have ^a prominent place. Furthermore this is taught in a natural way in solving real problems which the pupil feels in his present experience; therefore these facts are acquired through a natural motive. On the other hand the pupils by studying these industries get a wealth of information which the ordinary school under the present scheme cannot give.

The pupils acquire the ability of finding material from certain books without having been given the page references, which is as important as learning certain facts. That is, the ability to know where and how to find certain facts is as important as knowing the facts. This is one of the chief abilities developed by this Elementary School. Other traits as initiative, self-direction, ability to realize and see large problems (as developed by a study of methods of transportation), etc. are also developed.

The free and informal method of conducting the work also develops many desirable traits. If pupils acquire the ability of self-direction they can go from one problem to another without special direction from the teacher. This creates ~~a~~ "busy" atmosphere in the school room. This develops in the pupils habits of industry and application which insure success in times of work and in times of leisure.



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~~This thesis is never to leave this room.~~
~~Neither is it to be checked out overnight.~~



