

Central Washington University ScholarWorks@CWU

All Master's Theses

Master's Theses

1966

Concepts Which May be Used in a Study of Transportation in Elementary School Social Studies

Flora Jean O'Neill

Central Washington University

Follow this and additional works at: <http://digitalcommons.cwu.edu/etd>

 Part of the [Curriculum and Instruction Commons](#), [Curriculum and Social Inquiry Commons](#),
and the [Educational Methods Commons](#)

Recommended Citation

O'Neill, Flora Jean, "Concepts Which May be Used in a Study of Transportation in Elementary School Social Studies" (1966). *All Master's Theses*. 571.

<http://digitalcommons.cwu.edu/etd/571>

This Thesis is brought to you for free and open access by the Master's Theses at ScholarWorks@CWU. It has been accepted for inclusion in All Master's Theses by an authorized administrator of ScholarWorks@CWU. For more information, please contact pingfu@cwu.edu.

CONCEPTS WHICH MAY BE USED IN A STUDY OF TRANSPORTATION
IN ELEMENTARY SCHOOL SOCIAL STUDIES

A Thesis
Presented to
the Graduate Faculty
Central Washington State College

In Partial Fulfillment
of the Requirements for the Degree
Master of Education

by
Flora Jean O'Neill
December 1966

LD
5771.3
058c

SPECIAL
COLLECTION

144917

APPROVED FOR THE GRADUATE FACULTY

Donald J. Murphy, COMMITTEE CHAIRMAN

Dan A. Unruh

E. E. Samuelson

ACKNOWLEDGMENTS

The writer wishes to express her indebtedness to those who so generously contributed of their time and thoughts to this study.

Gratitude is particularly expressed to Dr. Donald J. Murphy, Chairman, and to the other members of the faculty committee, Dr. Dan Unruh and Dr. E. E. Samuelson, who were very helpful during the completion of the study.

Appreciation is due to Mrs. Mona Stacy for her inspiration and assistance.

Special thanks are given to Arthur and Sharon O'Neill, husband and daughter of the writer, for their encouragement and patience.

TABLE OF CONTENTS

CHAPTER	PAGE
I. INTRODUCTION.	1
The Problem	3
Importance of the study	4
Definitions of Terms.	5
Concepts.	5
Generalization.	6
Spiral curriculum	7
II. REVIEW OF LITERATURE.	9
III. RESEARCH DATA	19
Concepts Which May Be Developed During the Study of Transportation in Elementary School Social Studies	21
Transportation in General	22
Economic Aspects of Transportation.	35
Roads and Highways.	38
Water Routes.	40
Availability of Resources	48
Specialization of Production.	50
Transportation and Industry	52
Transportation Demand	58
Transportation and Trade.	61
Human Transportation.	64
Animal Transportation	65

CHAPTER	PAGE
Water Transportation, General.	66
Air Transportation, General.	76
Highway Transportation, General.	87
Railroad Transportation, General	96
Pipeline Transportation.	100
Urban Transportation	105
Socio-Cultural	109
Urban Developments	109
Cultural Diffusion	112
Distribution of Population	116
Political Aspects of Transportation.	120
Geographic Aspects of Transportation	122
Climate.	122
Surface Topography	123
Location of Settlements.	126
IV. SUMMARY AND IMPLICATIONS	128
Implications	129
BIBLIOGRAPHY	135

CHAPTER I

INTRODUCTION

Man has constantly tried to reach the pot of gold at the end of the rainbow--always journeying a little farther in a little less time. Whether man desires that pot of gold or the journey to it may be unanswerable; but for whatever motivations, man's fundamental concern with overcoming the vastness of distance and time has resulted in a magnificent achievement in transportation. Transportation remained essentially the same for five thousand years. Only within a brief span of the past few years has man been able to accept as commonplace such modes of transportation as automobiles, jet airplanes, and spacecraft that orbit the earth at speeds up to 17,500 miles per hour.

Ever advancing modes of transportation have played a key role in the everchanging way of man's life on earth, especially in the Twentieth Century. It may be the most important story in our lives as man moves on toward the stars.

To the modern child, the study of transportation is of immediate and powerful interest. Many children have not only traveled extensively in the United States, but abroad as well. Through the medium of television, the child's home is transplanted into the environments of all

parts of the world. The historic development of transportation with its tremendous impact on men and nations, and the expectations for the future presents challenging study.

The topic of transportation introduces a bewildering variety of facts. It is, therefore, important that essential concepts be identified and used for guide lines in the study of transportation.

The concepts within the study of transportation are not facts to be presented to the child. They are functional meanings and understandings which a child should acquire during a study of transportation. They provide the teacher with a framework for the unit.

The concepts should have a place in the sequential spiral pattern of the social studies curriculum. The concepts are reinforced from grade to grade as the scope of the social studies curriculum broadens and the experiences of children become more mature.

Children need opportunities to develop ideas; these ideas may be checked in a variety of ways to see if they are understood. Social studies experiences provide significant opportunities for children to look at the various elements of a situation, to be selective in choosing the important ones, and to seek multiple answers to problems. A major responsibility of the teacher is to provide a stimulating environment for children enabling them to participate in decision making in their daily experiences. As a

child matures, he profits from past experiences and utilizes old learnings in interpreting new situations.

The years of early childhood are of great importance. They are the time when children develop understandings about man's way of living in the world and the universe. According to Bruner, "Experience has shown that it is worth the effort to provide the growing child with problems that tempt him into next stages of development" (1:39). He further states, "Experiences over the past decade points to the fact that our schools may be wasting precious years by postponing the teaching of many important subjects on the ground that they are too difficult" (1:12).

I. THE PROBLEM

The purpose of this study was to identify concepts applicable to a unit on transportation in an elementary school social studies program. The concepts are those inherent in the generalizations identified in the doctoral dissertation, Transporting People and Goods, a study prepared by John Franklin Rambeau at Stanford University. The research project in which he took part is described in Chapter II.

Examples are presented to clarify the concept stated for each of the four hundred twenty-three generalizations contained in the dissertation. Information in the examples was obtained from encyclopedias, resource materials, and social studies textbooks.

Importance of the study. Many school curriculum guides and books related to the teaching of social studies advocate teaching of social studies by focusing upon concepts and generalizations drawn from the social sciences. To achieve this, units of instruction with related activities and instructional materials are organized to develop the selected concepts and generalizations.

At the present time, there is not available sufficient material which presents specific concepts related to the basic themes selected for emphasis in the social studies program. The teacher needs to be familiar with structure and a large number of concepts to adequately organize units, to plan appropriate learning experiences, and to locate pertinent instructional materials.

Curriculum guides have generally placed the initial study of transportation in the second or third grade. Basic concepts dealing with transportation are developed in depth in a spiral curriculum.

The purpose of this study was to identify those concepts applicable to a unit on transportation in an elementary school. All of these concepts will not be taught and others will not be developed fully. Interest, availability of time, or the presence of an appropriate teaching situation, will in part determine the extent of the experience.

Teachers may use the results of this study as a teaching resource. It is hoped the study may be useful to

school personnel interested in the conceptual approach to the social studies program.

II. DEFINITIONS OF TERMS

Concepts. Many definitions are given for concepts. Dorothy Furman's definition was utilized in this study. She defines concepts as the following:

Concepts are functional meanings and understandings which children acquire from their experiences as well as from subject matter (4:91).

Richard L. Carner said,

Concepts are the building blocks of learning. Although they may be defined in many ways, concepts are organized ideas which have evolved through experience. These ideas may be represented in words or terms which pinpoint the major characteristics of the concept itself.

It is through this kind of categorizing process that the individual can store vast numbers of concepts which he uses in his thinking process (3:1).

The Oregon Elementary Education Guide suggests the conceptual approach to social studies and has this to say about concepts:

Individuals formulate their own concepts. A concept is the result of the integration of perceptions through experience. Teachers are responsible for guiding children in this process of concept development. The formation of concepts begins early in life. Concepts emerge from memories, images, and imagination, and perceptions. Concepts expand; they become broader, deeper and are synthesized toward a generalization as the environment provides meaningful experiences and the individual matures (12:4).

Stendler has noted,

Concepts are important to the child (indeed to all human beings) for several reasons. They provide him with orderly, economical classifications of phenomena in the social and physical world; they enable him to predict events; they help him to know what to do under certain conditions.

Even more important, the child can modify his behavior in the light of his concepts. Concepts help us to make more intelligent choices of behavior (15:55).

The late William H. Burton in The Guidance of Learning Activities notes that:

Concepts, principles, attitudes, or complex special abilities are the products of long, slow growth processes involving many experiences. They cannot develop overnight out of assignments.

.....
Pupils do not develop motor skills immediately. So also with mental skills, social skills, and concepts. Time, varied experiences, contacts, and illustrations are necessary (2:32).

Generalization. Teig and Adams give this definition:

Generalizations are conclusions, truths, rules, or general laws, which express more or less stable relationships among concepts. This stability gives them more or less guide applications and usefulness in thinking. Generalizations, like concepts, are usually expressed in word symbols, which may or may not have meaning for pupils (17:146).

Hanna, Potter, and Hagaman state:

Generalizations are more complex than concepts and may be considered the final acquisition of understanding. Out of the relationships between concepts, generalizations are developed.

Generalizations must have wide reference. Children need rich and varied experiences from which to generalize. . . Like concepts, generalizations also have dimensions (8:319).

To use in their series of studies relating to social sciences, a team of researchers at Stanford University formulated the following operational definition:

A generalization is a universally applicable statement at the highest level of abstraction relevant to all time or stated times about man past and/or present, engaging in a basic human activity (9:73).

Spiral curriculum. References are made in this study to the spiral curriculum. This term is described by Bruner as:

A curriculum built around the great issues, principles, and values that a society deems worthy of the continual concern of its members. He says further: . . . instruction in these subjects should begin as intellectually honestly and as early as possible in a manner consistent with the child's form of thought. Let the topics be developed and redeveloped in later grades (1:521,524).

Bruner advocates use of the spiral curriculum to assist children in building special skills, attitudes, and understandings on a continuously and progressively more mature level of competence.

The concepts which are presented in this study relate to transportation and are designed to provide a framework for social studies units. They would be especially valuable to teachers or curriculum personnel planning instructional units using the conceptual approach to the social studies.

Transportation is an important aspect of living which is significant and interesting to children. The study of transportation gives pupils an insight into ways in which man interacts with his environment in order to meet his basic needs. Studying the history of transportation helps children to understand and accept the concept that change is inevitable in our society.

CHAPTER II

REVIEW OF LITERATURE

The aims and structure of the social studies program in the schools are of crucial importance in the assessment and selection of concepts for a unit on transportation.

Social studies programs are designed to include learning opportunities in which materials from the various disciplines of the social sciences are utilized rather than presenting them as separate subjects such as history or geography. In addition to these two traditional disciplines, the social studies curriculum now includes materials from the disciplines of political science, economics, sociology, anthropology, psychology and philosophy.

Provision is made for integrating other subjects in the social studies program. These may include art, music, physical education, science, the library, the language arts, and audio-visual program.

In addition to acquiring understandings and skills, provision is made for citizenship and education, because knowledge and skills are only important when applied in action. Hanna and Hagaman tell us that, "since children learn what they live, they can learn democratic values only by living democratically" (7:41). Hanna and Hagaman give as one of the action principles for social studies:

Most important of all, social studies in the elementary school should help children acquire the ethical values and social learnings needed by democratic societies. These include: respect and trust of others and their rights and feelings; concern for the welfare of others; common loyalties; recognition and appreciation of similarities and differences; integration of cultural differences to enrich life for all; respect for uniqueness and a good feeling about oneself and others (7:47).

An excellent expression of goals is stated in the philosophy for the social studies program of the schools in Lexington, Massachusetts quoted by John Gibson:

The basic responsibility of the social studies program is the development of informed citizens fully aware of the need for insuring the dignity and worth of the individual, for personal involvement in improving the society they have inherited, for appreciating the contributions of all cultures to society, and for recognizing the interdependence of all peoples. In the largest sense, then, the goal of the Social Studies is to prepare students for intelligent participation in a free society (5:5).

A trend in social studies curriculum design is the use of major themes based on concepts and generalizations drawn from the social sciences. The particular content of the social studies program at any point is not chosen for its own sake, but rather as a vehicle to carry certain scientific or philosophic concepts. In a sequential program, the deepening and broadening of conceptual understandings bind the content at one grade level to the content of the whole program.

Instructional units should contribute to the achievement of all the goals in the social studies. Each unit

should deal with an important aspect of living which is significant to children. It should have definite relationships to the needs and interests of children and should be challenging to them. It should give them increasing insight into ways in which man interacts with his environment in order to meet basic needs.

The unit should be related to children's past experiences and should lead to broader interests and other significant areas of experience.

Bruner tells us,

The first object of any act of learning, over and beyond the pleasure it may give, is that it should serve us in the future. Learning should not only take us somewhere; it should allow us later to go further more easily.
 The heart of the educational process is the continual broadening and deepening of knowledge in terms of basic and general ideas. This is brought about by learning initially not a skill, but a general idea which can then be used as a basis for recognizing subsequent problems as special cases of the idea originally mastered (1:17).

In the development of a unit the principle of "discovery" is used to capture the interest of the child. The teacher sets the stage for the chosen topic with bulletin boards, pictures or displays. In a discussion of these objects the pupils are stimulated to express questions, problems, needs and desires which require their efforts to "discover" the answers. Thus, emphasis is given to inductive processes. The pupils begin with related pieces of

information and organize them in such a way that significant ideas from the social sciences become apparent. This can be done only in an environment which provides the child with opportunities to use many activities, materials, and modes of expression. As children work together on significant problems, many occasions for social interaction enable them to practice the behaviors desirable for democratic citizens.

A report from the committee for social studies in the Ridgewood, New Jersey Public Schools emphasizes the importance of the conceptual approach to social studies in this statement of philosophy:

Research has shown that a common thread running through most present-day thinking about the social studies is the emphasis on the conceptual approach and any future examination of the Social Studies program should begin with such a conceptual approach and that the development of concepts to be taught in the K-12 Social Studies program should precede considerations of content selection and grade placement of content (14:3).

In the Oregon State Curriculum Guide a module is presented for the social problems approach. It lists the role of the teacher in selecting the broad framework of study, choosing the concepts, diagnosing needs of children, providing opportunities for problem solving and encouraging intuitive and speculative thinking towards new problems and situations. The learner is shown moving from one point to another from observation to transfer. Both the teacher

and the learner interact at each point.

The Montebello, California Unified School District curriculum guide for the social studies program describes units of study which would be helpful in assisting boys and girls to understand the world in which they live. The units include activities which provide opportunities for children to learn skills and values necessary for a democratic society. Each unit is based on a main idea and a limited number of concepts to be developed are listed. The Social Studies Point of View, as expressed in the curriculum guide, contains this statement:

Since facts sometimes lose their significance and even their validity in isolation and with the passage of time, the goal of the teacher is to help students integrate factual information into a series of broad understandings and enduring generalizations which will be helpful in solving life's problems (11:vi).

The Educational Research Council of Greater Cleveland also emphasizes the goal of understandings in contrast to the memorization of facts. In their teacher's guidebook for third grade social studies is this statement:

In a sequential program, such as GCSSP, the deepening and broadening of conceptual understandings are the links in the chain which binds the content at one grade level to the content of the whole program.

The teacher should, therefore, concentrate on helping the pupil to grasp, understand, and use concepts (6:vii).

Memorization of isolated facts as a method of teaching social studies has proved ineffectual in achieving this

desired goal. Taba has this to say,

Specific facts have only a temporary utility as means of acquiring ideas. Therefore, their acquisition and retention probably should have the lowest priority. Factual information is too vast, is increasing at too great a rate, is too much subject to obsolescence, and is too difficult to retain even if it were useful. Research has shown that about 80 per cent of disconnected facts are forgotten in two years or so.

Evidence is accumulating, however, that abstract concepts can be developed much earlier and at a higher level, provided the curriculum is organized to focus on ideas and that teaching is guided by adequate knowledge of how concepts are learned (16:212).

Careful planning is necessary for a successful social studies program. The curriculum should give attention to the understandings, skills, and attitudes needed by every citizen. In selecting the learning activities, provision is made for individual differences. The planning is done with an over-all curriculum design. Children's interests are considered and the children themselves will help to plan specific experiences, but these are within the over-all curriculum framework. Jarolimek has noted that,

The belief that topics for social studies units are selected entirely on the basis of passing interests of children is unreasonable and unsound educational practice. The job of planning the basic instructional program in social studies is not a child's task, but is primarily an adult responsibility (10:32).

Jarolimek is referring to the "activity schools" in which

pupil interests were basis for the curriculum. This trend began with the misuse of John Dewey's statement that learning "should be an experience" and "that material should be within the experience of the students."

Dewey became concerned about the lack of quality in these programs and said,

It is ground for legitimate criticism, however, when the ongoing movement of progressive education fails to recognize that the problem of selection and organization of subject matter for study and learning is fundamental. Improvisation that takes advantage of special occasions prevents teaching and learning from becoming stereotyped and dead. But the basic material of study cannot be picked up in a cursory manner. Occasions which are not and cannot be foreseen are bound to arise wherever there is intellectual freedom. They should be utilized. But there is a decided difference between using them in the development of a continuing line of activity and trusting to them to provide the chief material of learning (9:63).

Hanna and Lee discuss the efforts being made to restore balance in the social studies curriculum reflecting the philosophy that "today we teach children--something." This statement would seem to refer to the use of the conceptual approach to teaching social studies.

Wann, Dorn and Liddle tell us,

A concept grows from many experiences with a given idea or understanding. It is a convenient framework into which an individual has placed or categorized his experiences. It becomes a framework into which he can fit new experiences. . . . A system of concepts provides the basis for efficient learning through reducing the complexity of the environment (18:12).

The teacher has the responsibility to plan, organize and design the program for children's learnings. The first step is the identification of social studies concepts and generalizations which the school seeks to develop in its program. These may be broken down into levels of understanding for various grades. One of the advantages of setting goals in terms of basic concepts and understandings is that these understandings can be achieved through a variety of experiences. Preston emphasizes that the child should have an opportunity to enrich, relate and organize the concepts he learns. He says further that,

The child cannot acquire concepts by having them handed out to him; he must acquire them through experience, through seeing them in a variety of settings, and by discovering their relationships to other concepts (13:64).

The teacher initiates the unit of instruction by stimulating the children's interest. They are led to ask questions which become problems to be solved. In their search for answers, children will learn many new facts. When subject matter is viewed as a vehicle for the solution of problems, it will have a greater appeal for children.

Children learn as they interact with persons, objects and materials in their environment. A variety of activities and instructional resources are needed to help children develop richer meanings, clearer concepts, and deeper understandings. The relationship of the activities to the problems which they are solving, must be clear.

The teacher and pupils are constantly reviewing objectives, relating new learnings to old, and making evaluations.

With a desire to assist teachers, curriculum workers, and publishers design social studies programs for elementary schools, a group of educators at Stanford University working under the guidance of Professors Paul R. Hanna and Richard E. Gross, searched the literature of the social sciences for significant generalizations that could be used as a check for comprehensiveness and continuity in providing learning opportunities for pupils.

The team of researchers was composed of ten advanced graduate students and their faculty advisors from the School of Humanities and Sciences and from the School of Education.

At times the entire team of students and faculty met as a group to discuss purposes, assumptions, research design, specific techniques, and to review progress. Each student reported in a doctoral dissertation the generalizations pertaining to one category of basic human activity common to all cultures and societies.

The team and the faculty members selected the basic literature to form the core for all ten researchers. Six books in each of six social science disciplines were used. In addition, each researcher had an extended list of references to use in studying the particular category he had chosen for his assignment.

The team developed systems for identifying generalizations, recording them, coding, building a classification framework, verifying, synthesizing, and editing.

The competency of the researchers and the depth of their investigations gave validity to the generalizations contained in these studies. They are a rich source from which teachers, administrators, and curriculum workers may draw in giving substance, direction and much needed balance to their social studies program.

The research team emphasized that these generalizations did not constitute a social studies program. The generalizations reported in these studies were to be used as "anticipated outcomes" of instruction and to assist in organizing the concepts taught.

The dissertations prepared by the team of researchers at Stanford University are recorded on microfilm and are distributed through University Microfilm, Ann Arbor, Michigan.

John Franklin Rambeau prepared the dissertation "Transporting People and Goods," University Microfilm Number 20,438, October, 1956. The complete dissertation contains one hundred ninety-one pages and lists four hundred and twenty-three generalizations relating to the transporting of people and goods.

CHAPTER III

RESEARCH DATA

This study utilizes the generalizations in the dissertation Transporting People and Goods prepared by John Franklin Rambeau at Stanford University, 1956, to locate and identify concepts which could be included in the study of transportation in elementary school social studies programs.

The generalizations in the Rambeau study were examined and reworded in more simple language. The information in the examples was obtained by referring to encyclopedias, resource materials, and social studies books.

The concepts cover many phases of transportation and include understandings from the various disciplines of the social sciences. All relate to the basic human activity of transporting people and goods. This is one of the categories which is included in a design for elementary school social studies programs. Other categories included are:

1. Protecting and conserving human and natural resources and property.
2. Producing, exchanging, distributing, and consuming food, clothing, shelter, and other consumer goods and services.
3. Transporting people and goods.
4. Communicating ideas and feelings.

5. Providing recreation.
6. Organizing and governing.
7. Creating tools, techniques, and social arrangements.
8. Expressing and satisfying aesthetic and spiritual impulses.

In the spiral curriculum design, concepts within and related to these categories will reoccur at a broader and higher level of understanding.

The social studies program usually begins in first grade with the family and community which are the nearest to the child. The sequence often followed is:

1. The family community.
2. The school community.
3. The neighborhood community.
4. The local, county, and metropolitan communities.
5. The state community.
6. The region-of-states community.
7. The national community.
8. The United States and the emerging Inter-American community.
9. The United States and the emerging Atlantic community.
10. The United States and the emerging Pacific community.
11. The United States and the world community.

Many schools introduce the topic of transportation during the study of the neighborhood community. Additional

concepts regarding transportation add to the child's understanding as he follows the sequence of expanding horizons.

The concepts contained in this study cover all facets of transportation. Teachers and curriculum directors could choose the ones to develop in a particular unit. If one was interested in the economics of transportation, the concepts applicable to this subject could be selected. The locale of the school and the curriculum design would determine the use made of the teaching resource.

Concepts Which May Be Developed During the Study of Transportation in Elementary School Social Studies

The 423 concepts which are listed in this chapter were identified by examining the generalizations contained in the doctoral dissertation, Transporting People and Goods, prepared by John Franklin Rambeau at Stanford University.

The wording of the generalizations was simplified and three examples were included to clarify the meaning. The concepts are those inherent in the generalizations and the examples are compatible with the concept.

The numbers and the categorization are those used by Rambeau. The first two generalizations are quoted as they appear in the dissertation. Each generalization is followed by a concept related to it. Beginning with

Number 3, only the concepts are presented with three examples for each. The examples are designed to furnish additional resource materials for the user of this study.

I. TRANSPORTATION IN GENERAL

Generalization

- . . . new prospects of transportation improvement and increased efficiency are suggested by jet propulsion and the possibility of the application of atomic power.

1. Concept

Transportation will be improved and become more efficient with the increasing use of jet engines and atomic power.

Generalization

Man's need for transportation is timeless and all-inclusive. It is equally essential to economic, political, religious, educational and other cultural activity.

2. Concept

Man always has and always will need some form of transportation. Transportation is necessary for man's economic, political, religious, educational, and other cultural activity.

3. Present-day civilization is dependent upon modern transportation.

- a. The needs of a large urban population must be met with goods that require transportation.
- b. Factories need transport for raw materials and finished products.
- c. Large mechanized farms produce quantities of foodstuff which require transportation to markets.

4. The importance of boundaries between countries is measured by the geographical difficulty of crossing them or to restrictions imposed by man.
 - a. The Berlin Wall is a man-made restriction.
 - b. Oceans are natural boundaries.
 - c. High mountains restrict travel across Tibet.
5. Countries cannot progress without efficient, inexpensive transportation.
 - a. Northern lands, dependent upon boats and/or dog or reindeer power for transportation, have developed slowly.
 - b. Areas in China, dependent upon primitive means of transportation, have made little social or economic progress.
 - c. Viet Nam relies on primitive means of transportation, and development of this area has been hampered.
6. All forms of communication exist to transport man, his goods, or his ideas from one place to another.
 - a. Railroads, ships, airplanes, trucks all transport man and his goods.
 - b. Telephone, radio, and telegraph are media for transporting man's idea.
 - c. Mail carries man's written ideas.
7. The earliest known types of transportation are still being used in the world today.
 - a. Elephants are used in Asia.
 - b. Man carries much of his goods in China.
 - c. Yaks are used in Tibet.
8. Some type of land transportation is available in all parts of the world, but a few areas do not have water transportation.
 - a. Dogs and reindeer are used in some cold regions.

- b. Yaks and llamas are used in certain remote mountainous regions.
 - b. Camels carry man and his goods across deserts.
9. As new means of transportation are put into service, older types are used less.
- a. Buses have replaced many streetcars.
 - b. Air transport has lessened steamship transport.
 - c. Rapid transit systems have lessened the use of automobiles and buses.
10. Capital is required to buy or build any type of transportation excepting the human carrier.
- a. Animals must be bought or raised.
 - b. Capital is necessary to build power-operated vehicles.
 - c. Capital is necessary to build vehicles operated by man or animals, such as sleds, bicycles and wagons.
11. Different types of transportation are competing with each other to carry passengers and goods.
- a. Railroads and ships improve their facilities to attract passenger traffic from the airplanes.
 - b. Railroads and trucks are in competition to carry goods.
 - c. Helicopter crop dusting is in competition with surface operations.
12. The amount of public use determines the development of a mode of transportation.
- a. Rapid transit systems have developed fast because of public use.
 - b. Air transportation has made gigantic strides due to public use.
 - c. Growth of the trucking business came through public use.

13. The invention of new types of power leads to development of new vehicles.
 - a. The Polaris submarine and Savannah ship were built to utilize atomic power.
 - b. New types of locomotives were built, using diesel-electric power.
 - c. The invention of the steam engine led to the building of steamships and locomotives.
14. The problem of safety in transportation is of utmost importance in the building of new types of transportation.
 - a. Safety must be considered as more powerful engines capable of greater speed are put into automobiles.
 - b. Safety for passengers is of prime importance in space travel.
 - c. Additional safety devices are added to new aircraft.
15. Man can travel anywhere on the earth and communicate with people anywhere.
 - a. Radio messages can be sent anywhere.
 - b. Aircraft fly over all parts of the world.
 - c. Some form of transportation, vehicle, animal or human carrier is used everywhere on earth.
16. When transportation is improved, costs to shippers are generally reduced, or goods are shipped faster, or improvements are made in services.
 - a. The use of airplanes with larger passenger and freight capacity can reduce rates.
 - b. Improvements in highways and in trucks enable food to be brought to markets faster.
 - c. Canals reduce length of trips, so costs are reduced and passengers and goods are transported faster.

17. Modes of transportation in the world vary greatly, but the primitive methods are used chiefly in countries where travel conditions are difficult or where the people are very poor.
 - a. Llamas are used in the Andes Mountains.
 - b. The Eskimos' chief means of transportation are by boat and dog sled.
 - c. Camels are used by nomadic desert people.
18. Improvement of transportation is dependent upon the amount of traffic, money available, geography of the country, and the cultural conditions of the people.
 - a. Ice and snow restrict transport improvement.
 - b. Jungle lands make transport difficult.
 - c. Urban centers have highly developed transportation facilities.
19. People and property are easily transported with modern transportation.
 - a. Air transport is fast to all parts of the world.
 - b. Submarines transport men and goods underwater.
 - c. Rapid transit systems provide fast, safe transportation for urban population.
20. Goods are more valuable to people, because modern transportation carries them when and where they are wanted.
 - a. Foodstuffs grown in warmer climates are brought quickly to markets in the winter.
 - b. Products from many countries are used for manufacturing, because they can be transported over long distances.
 - c. Manufactured products are carried to far distant markets.

21. Transportation gives or increases value to goods by carrying them to places where they are used.
 - a. Cork from trees along the Mediterranean has value, because it can be transported to countries where it is widely used.
 - b. Trees used for pulpwood would have little value without transportation facilities for the wood and for the paper products.
 - c. Hardwoods from tropical rain forests are valuable products of trade.
22. Man has used much time and money to improve transportation.
 - a. Billions of dollars are being spent on space travel research.
 - b. The use of atomic power required new engineering.
 - c. Airplane companies have huge staffs working to design more efficient aircraft.
23. Our modern society could not exist without cheap transportation.
 - a. We would have no metals, no coal, no oil, nor products made from them.
 - b. People would need to spend most of their time raising food and it would be limited to the kinds grown in our own neighborhoods.
 - c. Help could not be rushed to scenes of disaster such as floods, earthquakes and famine.
24. Improvements in the power used for transportation has required new expensive machinery.
 - a. Facilities using atomic power required extensive research before new vehicles were built.
 - b. Space transportation developments are using a large portion of the nation's budget.
 - c. Railroad companies built new locomotives to utilize diesel-electric power.

25. People in early cultures were forced to live in small isolated groups, because transportation facilities were poor and physical barriers prevented travel.
 - a. Many small cultural groups lived in Asia Minor with water and desert barriers preventing transportation.
 - b. The Incas who lived in Peru were limited in transportation.
 - c. Aztec Indians inhabited areas of Mexico where mountains and water were barriers to transportation.
26. Better transportation facilities brought many changes in the lives of the people.
 - a. The Phoenicians developed water transportation by galleys and spread cultural products.
 - b. Portuguese originated the three-masted ship, which was the type used by Christopher Columbus.
 - c. The use of the steam engine in ships enabled more people to travel to many parts of the world.
27. The history of aircraft shows the efforts to make more powerful engines without adding weight; increasing size and speed of planes.
 - a. At present, aircraft companies are building planes with doubled passenger capacity.
 - b. New materials for airplane bodies are stronger and lighter.
 - c. Jet planes are constantly increasing speed of transport.
28. The first airplanes were developed by putting an engine on the glider.
 - a. In 1891, Otto Lilienthal, a German, made many flights in gliders.
 - b. In 1842, an Englishman built a glider, powered by steam, that flew about 120 feet.

- c. The Wright brothers put a gasoline engine on a glider patterned from those of Lilienthal.
29. Man has always desired to fly.
- a. A Greek legend tells about Daedalus who is supposed to have made wings of wax and feathers for himself and his son, Icarus.
 - b. Leonardo da Vinci drew many pictures of wings that could be attached to the arms and legs of men. He also drew sketches of parachutes, propellers and helicopters.
 - c. Man's first successful flights with wings were made in gliders.
30. The simplest flying instrument to construct is the balloon and flying was first successful in it.
- a. In 1783, a Frenchman, Pilatre de Rozier, was the first man to float in the air in a balloon.
 - b. In 1785, a balloon made the first air crossing of the English Channel in two hours.
 - c. J. A. C. Charles made balloons filled with hydrogen.
31. Airports are very necessary for aviation.
- a. Weather reports are a service of airports.
 - b. Landing and take-off facilities are improved as airplane designs are changed.
 - c. Passengers and freight require terminal facilities.
32. Aircraft design has been determined by the type of engines used.
- a. Increased speed of jet engines required the use of different metals which would withstand heat.
 - b. Wood was replaced by metal when more powerful engines were used.
 - c. Planes are grouped according to types of engines used.

33. Increasing use of automobiles has caused many new highways to be built at government expense.
 - a. Freeways connect many areas now and more are being built.
 - b. Highways are being improved with county, state and federal funds.
 - c. Even remote areas have access roads for motor vehicles.
34. Trade began first where travel over long distances was possible by using boats and horses.
 - a. Vikings traveled by boat to remote regions.
 - b. Many European countries carried on trade using river boats for transport.
 - c. People in the countries of southwestern Asia and southeastern Europe used horses to carry goods for trade.
35. In the ancient world, cities did not become very large or important, because travel was so limited.
 - a. Human carriers were the only source of transportation for thousands of years.
 - b. There were no roads built between the cities.
 - c. Early modes of transportation could be used only for short distances.
36. Road making is a fairly recent work of man.
 - a. Early man hacked his way through forests, climbed high mountains and waded through swamps and streams.
 - b. Most of the present highways have been built in the last 25 years.
 - c. The Romans built the first great system of paved roads.
37. Road making came before the building of railroads or the improvement of inland waterways.

- a. Roads were necessary for passenger and freight transport in horse-drawn vehicles.
 - b. The Inca Indians in Peru built 3,000 miles of stone surfaced roads along the Pacific side of the Andes Mountains.
 - c. China built a system of roads in 2700 B.C.
38. In comparison with the history of man, the use of animals and wheeled vehicles for transportation is relatively recent.
- a. Man tamed the ox, the donkey, the horse, and other beasts of burden about 6000 B.C.
 - b. The wheel was invented in the eastern Mediterranean region about 3000 B.C.
 - c. Egyptians built chariots in 2000 B.C.
39. Use of wheeled vehicles for transportation increased after the building of good roads by the Romans and later by Western European countries.
- a. The Romans built highways to control their empire.
 - b. In the A.D. 900's, the French invented the horse collar and traces enabling horses to pull heavier loads. This led to more road building and use of wheeled vehicles.
 - c. In the 1500's, road building had progressed enough for regular stagecoach lines to be established in Central Europe.
40. Modern highways were built after automobiles were priced low enough for many people to own them.
- a. The wide use of passenger automobiles started about 1914, but road improvements came slowly.
 - b. Around one million passenger automobiles are in use in the world today necessitating constant highway improvement.
 - c. Between 1921 and 1941, the United States added over one million miles of highway costing more than 40 billion dollars.

41. The use of the automobile for commercial purposes came after World War I.
 - a. The wartime use of trucks proved their efficiency.
 - b. With improved roads, the trucks could carry goods and merchandise to people throughout the world.
 - c. In the West and Midwest, highway trailers transported cattle to market or to new grazing fields.
42. Pipeline transportation over long distances is a recent development.
 - a. Pipelines are now used to carry crude petroleum, products of the refineries, natural gas, and crushed coal and water.
 - b. Trains formerly carried the crude petroleum to refineries.
 - c. Carrying coal mixed with water is a recent innovation.
43. Pipelines were used to carry water in ancient times.
 - a. Egyptians used pipelines to carry water for irrigation.
 - b. Limestone blocks with holes drilled in them were used to carry water in Jerusalem.
 - c. Romans brought drinking water from the mountains.
44. Carrying goods overland was slow and costly before the use of railroads.
 - a. Oxen-drawn wagons were one of the most common means of transportation.
 - b. Sleds were dragged or pulled across ice and snow.
 - c. Burros carried huge loads to market.

45. The use of steam-powered locomotives made railroads the leading form of transportation.
 - a. The first trains were pulled by horse and mule power.
 - b. The railroad era began in earnest in 1830 with the use of steam-powered locomotives.
 - c. The first transcontinental rail route was opened in 1869.
46. The invention of the wheel was most important in the progress of transportation.
 - a. Trucks, automobiles, trains and many other vehicles are dependent upon wheels.
 - b. The first wheels were used as rollers under heavily-loaded sleds.
 - c. Early wheels were rough discs of wood cut from tree trunks and fastened to each end of a small roller. This invention was about 5,000 years ago.
47. The use of steam-powered engines for railroad and steamship transportation made possible regularly scheduled, cheap long-distance transportation on land and water.
 - a. Steam engines were dependable.
 - b. Steam power was produced economically.
 - c. Many passengers and large amounts of freight could be carried long distances at reasonable rates.
48. The first method of transportation developed in a country is apt to be its waterways.
 - a. Improvement of existing waterways is cheaper than building roads.
 - b. Use of lakes and rivers for transportation began early.
 - c. Many types of carriers have always been used on waterways.

49. Transportation by water has been important to the development of areas producing raw products and to the areas where goods are manufactured and distributed.
- a. India became important because it had many products which Europeans desired.
 - b. Early traders shipped goods on the Seine, Rhine and Danube rivers in Western Europe.
 - c. The Southern states became important because they had cotton for export and it could be shipped by water to Europe.
50. Boats were propelled by man or wind until the use of the steam engine.
- a. Kufas made of reeds and skins were used on the Tigris River.
 - b. Outrigger fishing boats used palm leaf sails.
 - c. In 1838, the *Sirixes* was the first ship to cross the Atlantic Ocean entirely under steam power.
51. Floats and rafts were the first modes of water transportation with the use of boats coming much later.
- a. Single logs were the first water transportation.
 - b. Rafts of cocoanuts made the product its own means of transportation in the Philippines.
 - c. Logs were lashed together to make rafts.
52. The development of ocean travel changed the history of culture.
- a. The culture of early people was spread by the explorers.
 - b. Immigration by Europeans to the United States was possible by ocean passenger transportation.
 - c. Oceans serve as the main arteries of transportation between continents.

53. The steamboat made water transportation much cheaper, but the steam locomotive had an even greater effect on land transportation.
- a. The railroads made possible the settlement of the United States.
 - b. Railroads carried the products of the farms to markets.
 - c. Trains are especially useful for transporting coal, iron ore, grain, lumber, and other heavy products.
54. The ship was the chief means of transportation and communication for many centuries.
- a. Some type of boats was used in every country where water transportation was possible since very early times.
 - b. Man used some type of oar to propel the boat.
 - c. Man developed sails of various types of materials to utilize the wind for power.

II. ECONOMIC ASPECTS OF TRANSPORTATION

55. The terrain and climate of an area affect the development of transportation routes.
- a. Desert areas are not suited to modern land transportation.
 - b. Travel by wheeled vehicles on ice and snow is difficult.
 - c. High mountains, bodies of water and extremely hot or cold weather conditions are hindrances to land transportation.
56. The important trade routes are built in areas of dense population and high productivity.
- a. The large cities of the world are transportation centers.
 - b. Many transportation lines enter Michigan where the automobile industry is centered.

- c. On a map, Chicago resembles the hub of a wheel, because so many railroads enter that city.
57. Transportation is quicker and cheaper when routes follow the shortest line.
- a. Transportation is faster over level land than through mountains.
 - b. Airplanes follow the polar route to Northern Europe.
 - c. Canals are often built to make transport routes shorter.
58. War changes trade routes and interferes with the movements of people and goods.
- a. Ships may be forbidden to enter certain areas during wartime.
 - b. Nations have built walls to prevent the movement of people and goods across their boundaries.
 - c. The movement of troops and supplies has first priority on transportation facilities during wartime.
59. Transportation routes require loading of people and goods at certain points.
- a. Railroads cannot be built into every area.
 - b. Ships have terminals.
 - c. Bus routes generally follow the main highways.
60. The largest centers of trade are joined by main lines of transportation, but these lines rarely follow the shortest route.
- a. Roads and railroads used the passes in mountains to lessen costs of transportation.
 - b. Machinery for building routes over rough terrain was not available.
 - c. Intercoastal trade routes have to follow the coast lines.

61. The type of transportation used depends upon the types of barriers to be overcome.
 - a. Aircraft is a major type of transportation over water, ice, desert and high mountains.
62. New or better means of transport lead to changing or abandoning older routes.
 - a. Fast buses have replaced many ferries.
 - b. Faster motor vehicles require improved, straighter highways.
 - c. Faster trains require better road beds and elimination of curves.
63. The world's trade routes are classified into three general types: land, water, and air. (Self-explanatory)
64. Air and water routes do not follow as definite pattern as those of land.
 - a. Ships and aircraft can vary their routes if weather conditions warrant.
 - b. The aircraft routes can easily be changed according to the objective of the trip.
 - c. Air and water routes are mapped, but they do not have roads or tracks that they must follow.
65. The great world transportation routes are controlled by a few strategic positions.
 - a. All large cities require air and land transportation.
 - b. Large cities located by the ocean require land, water and air transportation.
 - c. Cities which are gateways to remote areas require transportation facilities.
66. Some remote locations are very important to trans-oceanic air routes.
 - a. Greenland is used as an air base.

- b. The Aleutian Islands are important to trans-oceanic air routes.
- c. The Azores in the Atlantic are on air routes.

Roads and Highways

67. Every important center has many highways going out from it.
- a. Los Angeles is a west coast center.
 - b. Denver is the market area for the Rocky Mountain states.
 - c. Washington, D.C. is a political center.
68. Highways are important for travel between communities and for long distance transportation.
- a. People in rural areas are not dependent upon nearby markets.
 - b. Good highways provide mobility for the workers of the nation.
 - c. Good highway transportation enables people to visit and to attend schools far from their homes.
69. The value of a highway cannot be measured by the amount of traffic it carries.
- a. Highways into remote areas provide access to natural resources.
 - b. Rural areas need highways although the total traffic is light.
 - c. Highways to recreational areas are valuable to citizens.
70. The road is the oldest and most used of all land routes.
- a. Some early roads were paths to water.
 - b. Early roads were hunting trails.
 - c. More people use land transportation than any other form.

71. Roads enable man to carry on his varied activities within the community.
 - a. School buses transport pupils.
 - b. Man's social activities are possible through the use of roads.
 - c. People use roads to carry on their business.
72. Roads are built to every human establishment in proportion to its attraction.
 - a. Capitol cities are centers of transportation.
 - b. Roads are developed to recreational areas in proportion to their use.
 - c. Market centers are also transportation centers.
73. Road design is related to historical and physical conditions.
 - a. Roads were developed to early trading centers and have remained in use.
 - b. Roads have been built along rivers and through mountain passes because these routes permitted easier construction.
 - c. These were also the routes used by man when he walked or took animals through these areas.
74. Effective use of wheeled vehicles depends upon improved roads.
 - a. The trucking industry could not have developed without good roads.
 - b. Use of automobiles for pleasure and work would be difficult with poor roads.
 - c. Public transportation on buses depends upon good roads.
75. Most land would be worthless without roads.
 - a. Timber in remote areas can be hauled to mills.

- b. Land containing minerals must have access roads.
 - c. Farm land has no value if there is no access to it.
76. Land transportation follows fixed routes which are built at great expense.
- a. Railroad tracks are costly to build and maintain.
 - b. Motor vehicles are operated on roads which are expensive to build.
 - c. Pipelines are expensive land transportation.
77. An established road system develops at the points of concentration.
- a. Manufacturing centers result in a network of roads to carry in raw products and deliver finished products.
 - b. Government centers are a strong factor in the concentration of roads in certain areas.
 - c. Well-known resorts give impetus to road building in their vicinity.

Water Routes

78. Control of the important trade routes (of the ocean) is of great political importance.
- a. Great Britain was long known as "Mistress of the Sea."
 - b. In spite of its small size, Holland maintained importance through its trade routes.
 - c. The United States carries on trade with almost all of the countries in the world. This is a factor in the political importance of the United States.
79. The location of bunkering stations influenced the routes of steamships.
- a. Ships changed routes to stop where fuel was available.

- b. Coal stations were set up on islands and other strategic places for ships to refuel.
 - c. Oil storage replaced coal bunker in many areas.
80. Ships use inter-oceanic canals to shorten the distance between ports. The toll charge has to be added to the transportation costs.
- a. Sometimes it is cheaper to travel farther than to pay toll charges.
 - b. The Panama Canal shortens by half the distance from the East Coast to the West Coast of the United States.
 - c. The Suez Canal links the Red and Mediterranean Seas.
81. The most important factor in the choice of ocean routes is the location of the producing area in relation to the importing region.
- a. Tankers from California carry wine to New York City via the Panama Canal.
 - b. Refrigerator ships take meat products from Australia.
 - c. Ships carrying pig iron from the United States to Great Britain follow trade routes across the Atlantic to Great Britain.
82. In a modern trade route, the water route may be a continuation of a land route and the coastline is a part of the route also.
- a. Automobiles being shipped by railroad to Seattle may be loaded on a boat going to Alaska. This boat may carry on inter-coastal shipping on its way North.
 - b. Shipments of grain which go to seaports, are loaded on ships which make stops at other coastal cities.
 - c. Fruit is transported by truck or train to the port where it is loaded on a boat that may stop at other coastal points before its final destination.

83. Seaports are the creations and creators of trade routes.
- a. Savannah, Georgia began as a trading center for plantation owners. Trade routes were designed to include it as one of the foremost Southern ports.
 - b. Amsterdam, Holland was the terminal for products from Dutch colonies, but it became an important export center.
 - c. Houston, Texas became important as a cotton export center and trade routes from it developed to areas importing cotton.
84. River transportation is not flexible, because it must follow the river course.
- a. Boats on the ocean or large lakes may vary their route when necessary.
 - b. Boats on the Columbia River must stay within its banks.
 - c. River transportation routes are hampered by rapids or waterfalls in the rivers.
85. Canals are built to make transportation routes shorter and more efficient.
- a. Wide use is made of canals for transportation in lowland countries such as Belgium and the Netherlands.
 - b. The Soo Canals allow ships to pass between Lake Superior and Lake Huron.
 - c. Canals link inland cities with the ocean.
86. Ships, especially passenger vessels, must use the safest route.
- a. Ships try to avoid icebergs even though they travel farther.
 - b. Ships detour to escape storms at sea.
 - c. Sometimes ships will not go into a port where there is a bar to cross with rough waters.

87. A port will grow faster if it is on a main route of travel.
- a. Anchorage has become the largest city in Alaska.
 - b. Seattle is the gateway to Alaska and a western terminal for overland routes.
 - c. New York City has grown very large because it is the chief travel, import and export center of the United States.
88. Man is constantly trying to reduce costs and the time used in transportation through making improvements in mechanism.
- a. Vehicles are made with larger capacity.
 - b. More efficient power is utilized.
 - c. Trucks and trains are constantly being improved so they can operate more smoothly.
89. Society benefits by increasingly cheaper transportation.
- a. More products can be purchased because the total cost is less.
 - b. More people can benefit from vacations because people can travel farther and enjoy more variety in their choice.
 - c. Medical care is easier to obtain since needed medical supplies as serums, blood plasma and antibiotics can be flown to the places where they are needed.
90. Modern transportation is responsible for considerable decrease in transportation costs.
- a. Modern locomotives can pull many more freight cars or passenger cars.
 - b. Modern planes can operate more cheaply with jet engines.
 - c. Buses transport many people quickly.

91. Any place without cheap transportation is dependent upon itself to satisfy the needs of the people.
 - a. Small countries in southeast Asia are dependent upon products within their boundaries.
 - b. Eskimos obtain their food by hunting and fishing.
 - c. Natives of South Sea islands utilize native fruits.

92. Transportation costs are high when goods have to be carried on the backs of men and animals over unimproved roads or in small boats, consequently trade is limited to small areas and to goods that have a high value in relation to their bulk.
 - a. Handmade laces and rugs can be sold at prices which warrant transporting them for long distances.
 - b. Small hand-carved articles made from wood or ivory can pay transportation costs.
 - c. The sale of large pottery vases and jugs is limited chiefly to the area where they are produced.

93. There is less danger of monopoly when man and his goods can be transported.
 - a. A wider variety of products is offered.
 - b. Different means of transportation can be utilized.
 - c. Foreign exports can compete with local products.

94. Transportation charges are part of the cost of production, so must be included in the price paid for the goods by the consumer.
 - a. The buyer must pay as a part of production costs, transportation charges, or the seller cannot stay in business.
 - b. Gasoline transportation is added to refinery expense in figuring total production costs.

- c. Goods made from farm products may carry several transportation costs in figuring the selling price.
- 95. The transportation cost is a large part of the price of any article which is bulky, if it has to be moved a considerable distance, or if it requires special handling.
 - a. Automobiles are bulky and their selling price is more because of the transportation costs.
 - b. Farm machinery moved for any distance has considerable freight charges which must be added to the selling price.
 - c. Cut flowers require fast transportation and special handling.
- 96. Transportation adds little to the price of any goods which are valuable, are not perishable, and move a short distance in reaching the consumer.
 - a. The transportation costs for jewelry would add little to the selling price.
 - b. Ladies' hats sent from New York City to nearby cities would have small transportation costs.
 - c. Truck produce raised on land near to city centers would have less transport costs than produce brought from more distant areas.
- 97. Fast transportation costs more, but allows certain goods to reach the market.
 - a. Perishable foodstuffs must be transported quickly.
 - b. Flowers from Hawaii can reach New York City within a few hours.
 - c. Tropical fruits are carried to cities in the north.
- 98. Cheaper transportation costs lower the selling price of goods, enabling more people to buy them.
 - a. Air transport charges have decreased with the use of larger planes, so perishable fruits and vegetables can be sent by air.

- b. Large trucks transport milk from farms to city centers for a reasonable rate.
 - c. Tanker boats transport petroleum products long distances.
99. Factories are built as near as possible to sources of raw products and to markets to reduce transportation costs.
- a. Factories making ladies' clothes are located in New York City close to large centers of population.
 - b. The bulk of the farm machinery is manufactured in the Central States where most of it is used and where iron and steel are available.
 - c. Cereal products are produced in factories in grain-growing areas.
100. Products from other countries have to be sold at a price that will pay transportation costs.
- a. Low labor costs of some imported articles enable them to be priced competitively, even with transportation costs added.
 - b. Desire for imported goods causes people to pay higher prices than they pay for similar domestic goods such as perfume, fashions, and art articles.
 - c. Small foreign cars imported to the United States are priced to include shipping costs.
101. The relationship of the transportation cost to total cost of goods used depends on the nature of the goods and the kind of transportation services required.
- a. Perishable goods need transportation by fast, specialized service.
 - b. Products requiring air transport have high transportation costs.
 - c. Goods for which there is a continuous steady market can be shipped by slower transport which lowers the cost of the product.

102. Industries using large quantities of raw materials recognize transportation costs as highly significant.
- a. Factories are often established close to the source of raw materials.
 - b. Oftentimes factories are located close to the population centers using their products.
 - c. These industries utilize water transportation when possible.
103. Cheap, efficient transportation reduces the consumer's cost through lowering production costs, by large scale production, increased geographical specialization, reduction in cost of assembling raw materials and increased scope of markets.
- a. Articles produced and sold in large quantities cost the consumer less money.
 - b. Certain geographical areas are better suited to specialized industrial activity.
 - c. Expanded markets cut production costs and reduce consumer costs.
104. Travel costs more when improvements are made for comfort and attractiveness.
- a. It costs more to sit in the first-class section of planes where seats are two abreast and there is more leg room.
 - b. Sleeping car space on trains costs more than daycoach space.
 - c. Deluxe appointments are provided by railroads and airlines for those who are willing to pay additional rates.
105. The lower the cost of transport the more uniform land values will be.
- a. People build homes in unimproved areas and as they do so, that land increases in value.
 - b. Land in remote areas becomes valuable when its products can be easily transported.

- c. Land can be used for industrial expansion if cheap transportation for workers, raw materials and finished products is available. This increases the value of the land.

Availability of Resources

- 106. Cheap transportation enables man to make better use of natural resources.
 - a. Natural resources, or raw materials, can be transported to industrial centers.
 - b. When transportation costs are cheap, new sources of raw materials can be developed.
 - c. Raw materials can be brought from other countries if transportation charges are low.
- 107. People can have a greater variety of goods with better transportation.
 - a. Fresh seafood from Alaska and Maine can be found in restaurants in all parts of the United States.
 - b. Quality steel is exported from Sweden.
 - c. Cheese and chocolate products are exported from Holland.
- 108. People have few goods to use in areas where transportation is by human carriers.
 - a. These people are limited to the use of materials found in their immediate vicinity.
 - b. They have few manufactured goods.
 - c. They are limited in the variety of foods they use.
- 109. Better transportation helps people have better housing, food and clothing.
 - a. Finished lumber instead of logs can be used for houses.
 - b. Balanced diets can be maintained with a variety of foods.

- c. Manufactured clothing can be shipped everywhere and people can enjoy a greater variety of materials and styles.
110. Modern transportation is a necessary part of the world today. Raw products and finished products are exchanged by means of transportation.
- a. Iron ore from Minnesota is shipped to mills in Pennsylvania and the finished steel products are then shipped all over the world.
 - b. Logs are shipped to Japan from western United States and finished wood products are exported from Japan.
 - c. Wool is transported to mills and cloth is sent back to the area of origin.
111. People do not need to depend upon their communities for goods, because food and raw materials for manufacture can be transported from other places.
- a. Fresh fruits and vegetables can be used all year, because they can be transported to markets.
 - b. Grain is grown many miles from the areas using the finished products.
 - c. Cotton is shipped from southern states to mills miles away.
112. Land which could be used for farming, logging or mining is of little use without transportation for the products.
- a. Without efficient transportation services the produce from the fertile valleys of southern California would have no market.
 - b. Redwood siding and veneer are used in all parts of our country, because these finished products are transported from mills where they are processed.
 - c. Bolivia has found a world market for tin, because the raw material is transported elsewhere for manufacture.

113. Fast transportation is necessary to carry food to large cities before it spoils.
- a. Refrigerated trucks carry fresh milk from farms to cities.
 - b. Fresh tropical fruits are flown to large cities everywhere.
 - c. Fresh meats are transported by refrigerated trucks from meat packing centers to large cities.
114. The amount of perishable food supplied to large cities is limited by speed of transport.
- a. During transportation labor strikes, people in large cities are dependent upon non-perishable foods.
 - b. Weather conditions can hamper transportation of perishable food.
 - c. Some cities are located far from the sources of perishable food needed by the inhabitants.

Specialization of Production

115. Higher standards of living and increased production are possible because cheap, efficient transportation makes possible a division of labor on a geographical or territorial basis.
- a. Automobiles are often assembled in the areas where they are sold.
 - b. Petroleum is transported by pipelines to refineries near the market for the products.
 - c. Malaya produces most of the ore that is made into tin, but the United States uses a large proportion of it.
116. High transportation costs are a barrier to trade and profitable specialization.
- a. High transportation costs of lumber produced in the interior of Alaska prevent the development of this industry.

- b. Few products from jungle areas can be sold to pay transportation costs.
 - c. Desert transportation is expensive, thus limiting the exports from these areas.
117. Individual plants have been able to achieve the same economies of specialization and division of labor as large production plants through improved transportation.
- a. Small manufacturing plants produce many parts of airplanes.
 - b. Electrical motors are manufactured separately from appliances.
 - c. Small sawmills sell unfinished lumber to mills.
118. With the development of transportation facilities, man was first enabled, and later driven, to agricultural specialization.
- a. Low transportation costs enable farmers to compete in distant markets.
 - b. Only crops well-suited to an area can be sold at a profit, because farmers have been forced to buy expensive machinery and to farm large acreages.
 - c. The development of transportation facilities enabled farmers to grow crops for distant markets.
119. National unity is essential, because efficient transportation promotes regional specialization.
- a. Laws affecting transportation need to be uniform throughout a nation.
 - b. Transportation rates need to be determined on a national rather than a local basis.
 - c. All transportation facilities have nation-wide routes.
120. Commerce is increased because regional specialization and transportation facilities are improved.

- a. Airplane factories located in the western states require many products from other regions.
 - b. Manufacturers of farm machinery need transport for raw materials and for finished products.
 - c. Lumber mills in the Northwest ship their products to all parts of the world.
121. Good transportation encourages specialization of occupation resulting in interdependence of groups occupying larger areas.
- a. Many people in Seattle, Washington work for Boeing Airplane Company and need food from farm areas.
 - b. Iron workers in Pittsburgh, Pennsylvania require food and clothing.
 - c. Stockyards and meat packing plants in St. Louis are dependent upon cattle raised on farms in many states.

Transportation and Industry

122. Modern industry is dependent upon good means of transportation.
- a. Raw materials from many sources are used in making steel and iron.
 - b. Pre-fab buildings are manufactured far from sources of the materials used.
 - c. Paper from Canada is used for books printed in Kingsport, Tennessee.
123. Transportation and industrial development act and react upon each other.
- a. Oil wells were developed in South America when transportation became feasible.
 - b. Some types of mining are abandoned because the methods used are too expensive for the products to compete with those transported from other regions.

- c. Manufacturing plants are often located at seaports so the products can be shipped cheaply by water.
124. Industrial areas are dependent upon locations favorable for water transportation which give access to world trade.
- a. Many industries require cheap transportation by water for large quantities of heavy raw products used in manufacturing.
 - b. Easy, economical water transportation of finished products enable the manufacturer to compete in world markets and to build a large volume of trade.
 - c. Less handling of goods is required if factories are located at seaports.
125. Industrial development necessitates different types of transportation.
- a. The "piggy back" method of hauling loaded truck trailers by rail eliminates one handling of freight and allows cheaper transportation.
 - b. Special truck carriers take automobiles from factories to distributing centers.
 - c. Refrigerated facilities carry fresh meat to canneries.
126. A growing economy requires increasing transportation facilities.
- a. Expansion of existing industrial plants requires additional transportation.
 - b. Location of new industries in a locality requires transport for raw materials, finished products and manpower.
 - c. Transportation for raw products from other countries is necessary for some industries.
127. Every industry requires suitable transportation facilities for obtaining raw products and for distribution of its finished goods.

- a. A fruit evaporating plant requires special trucks to bring fruit and to haul the dried product to market during its season of operation.
 - b. Sheep are transported in double-deck freight cars to meat packing plants.
 - c. High-grade finished lumber is transported in freight cars sealed against dampness.
128. Improvements in transportation stimulate advances in industry which bring further improvements in transportation and services.
- a. Improved airplane design permits larger freight shipments.
 - b. Industries dependent upon air freight can expand with easier shipment of products.
 - c. Locomotives haul more freight cars and the cheaper rate stimulates industries which use rail transport.
129. A large, highly industrialized nation with many industrial centers provides an ideal environment for extensive travel.
- a. Industrial centers have funds to establish research laboratories which are attractive to scientists and other interested persons. In Midland, Michigan, the Dow Chemical Company has a guided bus tour through their plant.
 - b. Industrial centers often provide parks and cultural opportunities within the city.
 - c. Travel across a nation with varied industrial centers provides interesting and stimulating experiences.
130. Great industrial centers are railroad centers also and growth of one promotes the development of the other.
- a. Travel and freight shipments on many railroads have contributed to the growth of Chicago.

- b. Nine main railroad lines meet in Buffalo, New York. The shipping on these lines brings further development to Buffalo.
 - c. A great variety of products are shipped in and out of Atlanta, Georgia on thirteen railroad lines.
131. Transportation is necessary for the marketing of farm products.
- a. Milk is sent in refrigerated tank cars to urban areas.
 - b. Trucks with trailers transport apples to market.
 - c. Farm animals are transported in specially designed freight cars.
132. There are social gains when adequate transportation makes possible large-scale production.
- a. Workers have facilities to go to and from work.
 - b. Production costs are lowered and consumers can buy more goods.
 - c. More fringe benefits for workers are provided by companies with large-scale operations.
133. Availability of good transportation is a major factor in choosing location of industries.
- a. Refineries are often located at seaports.
 - b. Textile mills are located in areas where transport of raw materials is available.
 - c. Large industries located near the Great Lakes because iron ore could be transported by water.
134. Transportation charges are less on products manufactured near markets because the haul is shorter.
- a. Farm machinery manufactured in Illinois has a large market nearby.

- b. Steel mills in Ohio are near markets for their products.
 - c. Petroleum products refined in New Jersey are close to markets.
135. Locating industries near markets insures short hauls for heavy raw products and lowers transportation costs.
- a. Manufacturing heavy building materials close to cities reduces transportation costs.
 - b. Steel mills located near supplies of iron and coal lessen transport costs.
 - c. Paper mills are often located at seaports so pulp and paper goods can be transported by water.
136. Motor transportation has greatly influenced the location of industry.
- a. Many articles can be transported cheaply by motor freight because less handling is required.
 - b. Motor freight provides transport in some areas where there are no railroads.
 - c. Motor freight provides faster transport than railroads for most products.
137. The size of industrial development is determined by the services available and the rates charged by transport carriers serving it.
- a. Some industries require cheap water transportation in order to sell their products at a profit.
 - b. Large industrial companies need water transportation or efficient, inexpensive rail service.
 - c. Well-developed trucking facilities are suited for some industries.
138. Motor truck transportation lessens handling of goods, and reduces congestion in production areas.

- a. Trucks take products to their destination.
 - b. Fewer workers are needed with direct transportation from producer to consumer.
 - c. There are fewer delays with motor truck transportation.
139. Motor transportation has especially helped small-scale industries.
- a. Few supplies are needed for small-scale operations.
 - b. Certain goods need the fast transportation provided by trucks.
 - c. Products are delivered directly to the jobber, so better service is provided to the consumer.
140. Water transportation needs docks and other harbor facilities to accommodate vessels and to provide for loading, unloading and storage of cargo.
- a. Large warehouses store goods at the dock.
 - b. Cranes are used to unload and load boats.
 - c. Many dock workers are hired to service the vessels.
141. Passenger transportation is an important economic activity.
- a. Workers need transportation to and from their work.
 - b. Public passenger transportation is important in bringing customers to stores.
 - c. Employees and executives are required to make many long business trips.
142. Industries and communities thrive when freight rates are favorable.
- a. Products can be priced at competitive prices so they will be purchased.

- b. Industries cannot stay in business if their products can't be sold for a profit.
 - c. Perishable products can be sent in refrigerated carriers if transportation charges are reasonable.
143. Economic development is impossible without adequate means of transportation.
- a. Areas with raw materials cannot export them without means of transport.
 - b. Manufacturing depends upon transportation of raw materials and finished products.
 - c. Farm products need transport to areas where they can be converted into food for men and animals.
144. Advanced stages of economic development are impossible without development of adequate means of transportation.
- a. Strikes of workers in transportation have given conclusive proof to the necessity of transport for materials of industry.
 - b. Building construction would cease without adequate transportation facilities.
 - c. Workers are needed to operate industrial plants and they need transportation.

Transportation Demand

145. Transportation facilities increase with the demand for them.
- a. Rapid transit systems are being built in many cities.
 - b. New bus routes are established when customers need additional service.
 - c. Transportation facilities decrease or are abandoned when the demand does not exist.
146. The demand for transportation comes from the desire for commodities or for transportation services.

- a. People ask cities to establish public passenger transportation as a service to the citizens.
 - b. Refrigerated services are provided because people want fresh fruits and vegetables during the whole year.
 - c. Plane service to Alaska is regular and often reflects public demand.
147. Public use determines the success of any type of transportation.
- a. Widespread use of buses has lessened the number of passenger trains.
 - b. Motor freight transport has largely replaced train transport in some industries. (logging)
 - c. Buses have replaced ferries in areas where the longer trip by bus provides more efficient service to the public.
148. The class of freight or passengers transported determines the kind and quality of transportation.
- a. People of means will pay for "red carpet, champagne flight" air transport.
 - b. Commodities affected by freezing weather need protection in a carrier.
 - c. School buses are designed to meet the needs of the passengers.
149. Competition is an important factor in the demand for transportation.
- a. Airlines compete for passengers by offering luxury services.
 - b. Passenger and freight transport is shortened by eliminating stops and by using improved vehicles.
 - c. Luxury liners compete with airlines for trans-oceanic passenger trade.

150. Public interest influences the demand for and the supply of transportation.
- a. Traffic congestion in urban areas has encouraged development of rapid transit systems.
 - b. Increasing passenger trade on airlines has brought additional flights.
 - c. New industrial developments make additional rail transport necessary.
151. Long distance inter-city passenger transportation is necessary in urban centers for commercial traveling and social visiting.
- a. Areas within a large city may be miles apart.
 - b. Although the distances are not great, interdependence in the city demands good transportation facilities.
 - c. The use of private automobiles is difficult in congested traffic of urban centers.
152. The need for both freight and passenger transportation is greatly increased during wartime.
- a. Military personnel have first priority on airplanes.
 - b. Large shipments of war materials use rail transport.
 - c. All forms of passenger service are used more during wartime due to mobility of the population.
153. The public wants passenger service that is convenient, fast, safe, cheap, dependable, and comfortable.
- a. Passengers patronize airlines which have good safety records.
 - b. Passengers are willing to pay for safe, fast, comfortable, train service.
 - c. Rest rooms and comfortable reclining chairs are standard equipment on passenger buses.

Transportation and Trade

154. Man has greater opportunities for trade with increasing population and improvements in transportation.
- a. There are more users of goods.
 - b. Better transportation facilities deliver goods directly to the consumer.
 - c. Better transportation allows mobility of workers and increases their income.
155. Routes of trade, the carriers operating over them, and the terminals of these carriers, exist to provide services needed for commodities that are being exchanged.
- a. Rail routes are designed to provide service for freight.
 - b. Steamships are built to carry a special type of cargo.
 - c. Motor freight truck lines operate many different types of vehicles.
156. The cost of transporting goods over long distances or in areas where transportation is difficult increases the cost of the products and lessens the amount of trade.
- a. In remote mountainous areas, only valuable minerals justify transportation costs.
 - b. Products from Australia sent to Great Britain are priced to bear transport costs.
 - c. Demand determines whether goods can be priced to pay for transportation; when demand is low, trade lessens or stops.
157. More transportation services are required when goods are transported over greater distances.
- a. Products from jungle lands may require human, local boat, ship, and truck transportation before reaching markets.
 - b. Mining operations in mountains require various types of transport.

- c. Apples from the Northwest will be carried in different types of transport before reaching Great Britain.
158. Goods are carried over every trade route.
- a. Human carriers bring products from remote regions over trade routes to markets.
 - b. Fish are transported by water routes.
 - c. Freight is carried by air transport over air routes.
159. Foreign trade depends upon adequate ocean shipping and reasonable rates for inland transportation.
- a. Most goods for foreign trade must be produced in areas served by steamships.
 - b. Shipping routes are altered when the volume of goods justifies doing it.
 - c. Inland transport is necessary for most goods carried by ocean shipping, so such charges need to be reasonable or the goods cannot be sold profitably.
160. Shipping is necessary to trade, and trade is necessary for shipping.
- a. Ships cannot operate if there is no trade.
 - b. Goods are useless without transportation.
 - c. Reasonable transportation costs contribute to the development of both trade and shipping.
161. Transporting goods to places where man can use them is just as important as changing the form of things to make them useful to man.
- a. Some desirable products cannot be used because the areas are too inaccessible for transporting the goods to markets.
 - b. Manufactured articles are of little value unless they can be transported to users.
 - c. Farm products changed into edible goods need transport to markets.

162. Leading commercial nations are developing many new types of transportation.
 - a. American aviation companies receive many orders for aircraft from other nations while designs are still on the drawing boards.
 - b. Rail transportation is being improved by important nations.
 - c. Good bus transportation is available in leading countries.
163. Extensive markets require low-cost, fast, dependable transportation.
 - a. Extensive trade with Japan is made possible through low-cost shipping.
 - b. Wheat is shipped in boats with large capacity to distant ports.
 - c. The demand for petroleum products is met with shipments by pipeline, tanker boats and tanker cars on the railroads.
164. Good transportation helps avoid waste from over-production and stabilizes prices.
 - a. Surplus products can be shipped to areas where they are needed.
 - b. Man's desire for food produced in different climates can be met through good transportation.
 - c. Good transportation enables the producer to receive fair prices for his goods by transporting them where they can be sold.
165. Food and manufactured goods can be transported hundreds of miles in one day.
 - a. Tropical foods are flown to urban centers many miles distant.
 - b. Manufactured products needing fast transportation are flown to their destination.
 - c. Fast freight trains make few stops and deliver large quantities of goods in a short time.

166. Other things being equal, faster transportation lessens the time goods are in transit.
- a. Some goods have to be brought by slow transport to terminals of fast transport making total time in transit longer.
 - b. Fruits and vegetables are loaded directly on fast refrigerated trucks and taken to markets.
 - c. Goods transported by air freight are usually produced close to the terminal and delivered directly to markets.
167. Fast transportation places goods from all parts of the world in competition.
- a. Japan produces many motorcycles sold in the United States.
 - b. Foreign cars from Europe and Japan compete with those made in America.
 - c. Lumber from Canada competes with that produced in the United States.
168. Nations must allow vessels from other countries in their ports to keep friendly trade relations.
- a. Few nations have restrictions which prohibit the ships of other countries from entering their ports.
 - b. Definite agreements among the nations concerned regulate transportation.
 - c. The huge shipping industry in the world has developed because vessels could enter foreign ports.

Human Transportation

169. The human body was the earliest and most commonly used means of land transport.
- a. Primitive man used human carriers for thousands of years.
 - b. Many primitive nations are still using human carriers for transport.

- c. Human carriers are widely used in remote mountainous areas.
170. The simplest form of land transport is by human carrier.
- a. Human motive power carries small packages for short distances in all societies.
 - b. Walking is a common form of human transport.
 - c. Large loads are carried by natives in China, Tibet and southeastern Asian countries.
171. Human carriers increase their carrying capacity by using containers and ropes or cords.
- a. Pottery jars are used as containers for goods transported by human carriers.
 - b. Poultry is carried to market in baskets in South America.
 - c. Wicker containers are used in China for transporting goods.
172. Human carriers are not suited for carrying large loads for long distances.
- a. Goods transported by human carrier are usually marketed nearby.
 - b. Large loads need power-operated vehicles for transport.
 - c. Human carriers are too slow for the economy of modern nations.

Animal Transportation

173. Animal transportation allows man to use resources from a wider area.
- a. Camels carry goods in desert areas.
 - b. Reindeer pull sleds in Lapland making trade possible for the inhabitants.
 - c. Donkeys transport goods to market in Mexico.

174. Use of animal transport made it possible for larger numbers to live together in a social group.
- a. Man can travel long distances with animal transport.
 - b. The use of animal transport makes goods more available.
 - c. Man was not as restricted by distance from the center of his social group when he could travel and return by animal transport.
175. Animals are more valuable for transportation in other ways than by riding or packing.
- a. Indians used animals to drag goods loaded on a "travois."
 - b. Oxen pulled covered wagons over the plains.
 - c. Horses were the power for stagecoach travel.
176. Horses can be ridden over plains, but cannot be driven easily through the woods without roads.
- a. Trees and shrubbery prevent easy transport by horse.
 - b. Vehicles cannot go over logs and through forested areas.
 - c. Plains areas do not have growth to impede travel.

Water Transportation, General

177. Nations have been interested in shipping ever since ships began to sail.
- a. Phoenician sailors carried on extensive trade with countries along the Mediterranean Sea.
 - b. Ships were sent out by Viking nations in 1000 A.D.
 - c. Egyptian boats sailed on the Nile River as early as 5000 B.C.

178. Shipping by water is essential to a nation's economic development and is a necessity in time of war.
- a. Economic development depends upon transport of raw materials and goods overseas.
 - b. Supplies and troops need water transport during a period of war.
 - c. The nations which control shipping lanes lead in economic development.
179. Aid for the development of water transportation and regulations for its control are functions of the government.
- a. A nation prospers with development of its water transportation.
 - b. Regulations to control water transportation are necessary to protect owners and shippers.
 - c. Water transportation is rarely limited to one state, consequently federal controls for its regulation are necessary.
180. The strength of a nation on the sea is partly decided by how much that nation imports and exports.
- a. Nations become important as they import and export large quantities of goods.
 - b. Great Britain was the foremost country in the world for many years due to the extensive trade with colonies and other countries.
 - c. Portugal, although small, was important in the 15th century due to its extensive water transportation.
181. Seaports need facilities for handling ships and cargoes.
- a. Storage warehouses are needed at docks.
 - b. Special machinery is required to load and unload ships.
 - c. Suitable docks are necessary at a harbor.

182. There are many types of water transports.
- a. Ferries are used on lakes, rivers and oceans.
 - b. Passenger liners are large and luxurious.
 - c. Tramp steamers are used for intercoastal shipping.
183. Water transportation is slow and is not always dependable.
- a. Water transport is used when speed is not a chief factor.
 - b. Water transport is slower than air transport, but it is used for large loads.
 - c. Storms at sea are dangerous for water carriers.
184. The greatest advantage of water transportation is its low cost.
- a. Huge amounts of freight can be carried economically by water transport.
 - b. Modern steamships can transport many passengers.
 - c. Ferry boats that carry both passengers and automobiles can operate for less because the volume of business is greater.
185. Water carriers are good for carrying large quantities of bulk freight where speed is not as important as low transportation charges.
- a. Wheat needs low transport rates for overseas shipment.
 - b. Tanker ships carry petroleum for reasonable rates.
 - c. Water transport is suitable for iron ore.
186. Water carriers are not suited to carrying freight in small quantities, for carrying perishable products, or for transporting valuable goods.
- a. Valuable goods can afford to add higher transportation costs.

- b. Perishable products need fast transport to arrive in useable condition.
 - c. Small quantities of goods can be transported reasonably by air or land transport.
187. Water transportation is safe and is suited to carrying people and goods over long distances where low cost is more important than speed of transport.
- a. Modern passenger ships have good safety records.
 - b. Air transport is too expensive for many people to use unless time is a factor.
 - c. Many people are afraid to travel across the ocean in airplanes.
188. Loads are moved easily on barges and ships because the water surface is level.
- a. Land transportation has to overcome more resistance than water transport.
 - b. Huge loads can be transported economically on barges because small tug boats pull them easily over water.
 - c. Water transport does not have difficult terrain to cross.
189. Many changes in water carriers are being made and different power is being used for operating them.
- a. Sailing vessels are used very little for commercial purposes.
 - b. Diesel oil is widely used for fuel.
 - c. Atomic-powered ships have been built.
190. Ocean transportation differs greatly from other forms of transportation.
- a. Ocean transportation requires no investment for roads or tracks.
 - b. Regulations for operating ocean transportation are different than those for land.

- c. Ocean vessels can vary routes they travel.
191. Ocean shipping rates have to be reasonable and the carriers from each country must charge similar rates to attract business.
- a. Goods carried by water transport are priced to attract purchasers, so transport rates must be fairly uniform.
 - b. Rates charged need to insure a fair profit for the carriers.
 - c. Costs for water transport are higher for United States' vessels, so the government pays part of the cost with subsidies so the carriers can compete with those of other countries.
192. Ocean carriers are not competing with other types of transportation except in a small way with airlines.
- a. Land transportation carriers cannot be used on water.
 - b. Airlines cannot compete with water carriers for large shipments of goods.
 - c. Passenger vessel rates are cheaper than those charged by airlines.
193. It is important for vessels to be loaded and unloaded promptly and efficiently.
- a. Vessels cannot afford to be delayed at ports due to inefficient loading or unloading facilities.
 - b. Provision for speedy repair and cleaning of vessels is necessary at ports.
 - c. Dock workers are necessary for prompt loading and unloading of vessels.
194. The capital investment required for large ocean carriers is chiefly in the carriers.
- a. Building and maintaining tracks are large expenses of rail transport.

- b. Trucks, automobiles and buses require a good system of paved roads.
 - c. Oceans serve as the main arteries of transportation between continents with no cost for building or maintenance.
195. Large organizations own the water carriers of the world and have invested large sums in their operation.
- a. Six steamship lines in the United States operate most of the water transport carriers.
 - b. Only large companies can afford to build and operate steamship lines.
 - c. Companies in the United States, Great Britain and Norway own the leading merchant fleets of the world.
196. The shipping business receives its income by carrying goods and passengers.
- a. The shipping industry depends upon revenue from freight and passenger charges for its existence.
 - b. Shipping companies specialize in different services.
 - c. Shipping companies of other nations carry the flags of small countries where they pay no taxes and cheap labor is available and they can reduce their costs.
197. Water carriers need many terminal facilities for carrying on their operations.
- a. Cargoes have to be transferred to land carriers.
 - b. Provisions for contacting government agencies are needed.
 - c. Vessels need to be serviced.
198. Water carriers are used less when prices are rising, because speed and service become more important.

- a. Higher priced goods can carry larger transportation charges.
 - b. Water transportation is used less when prices are favorable and shippers can afford higher transportation costs.
 - c. Shippers will not risk long delays by water transport for perishable products if prices justify other means of transport.
199. Carrying mail to all parts of the world is an important service of the steamship lines.
- a. Steamship lines are paid to carry mail.
 - b. The international mail service is important to the steamship lines of the world.
 - c. International agreements are necessary for handling mail.
200. Many important legal papers are necessary to protect the goods and the owners of the ships.
- a. Shipments of goods are checked on arrival with the papers made on loading.
 - b. Certain types of products are excluded from countries and these laws are published.
 - c. International agreements are made for safety, navigational practices and responsibility in case of accidents.
201. Insurance is necessary for the owners of the cargo, for the passengers and for the owners of the vessels.
- a. Insurance is carried by shipping lines to pay for losses to cargo.
 - b. Passenger lines carry insurance to pay for accidents to passengers and for loss of life.
 - c. Owners of vessels carry insurance to reimburse them for accidents to or loss of their property.

202. People like to travel on modern steamships, because they can rest and enjoy themselves.
- a. The Lurline, a luxury liner owned by the Matson Company, transports many passengers to Hawaii.
 - b. Passengers who desire a relaxing vacation take trips on ships.
 - c. The leading steamship companies all operate passenger liners with deluxe accommodations.
203. Competition for ocean-passenger traffic is international as well as inter-steamship company.
- a. Leading companies add more vessels to attract customers.
 - b. Liners offer more luxury for the comfort of passengers.
 - c. Faster boats are put into use to meet competition.
204. Passenger steamships have been built primarily for size, speed, comfort and safety.
- a. Passengers are willing to pay for safety, speed and comfort in water transportation.
 - b. It is difficult to build passenger ships using expense of construction as a chief factor.
 - c. Passenger vessels with large capacity and varying types of accommodations can return profit to the owners.
205. Shipping is a key element in a country's commercial policy and in the inventory of a country's military strength.
- a. Successful wartime operations require shipping facilities.
 - b. Enemies are less apt to wage war against countries with highly-developed shipping.
 - c. The importance of the economy of a nation is measured largely by its shipping development.

206. The need to exchange goods between peoples of the earth has brought about international shipping.
- a. People began to exchange commodities by water shipping thousands of years ago.
 - b. Desire for spices and fabrics in India led to exploration of the world.
 - c. Man's desire for variety in goods has led to shipping development throughout history.
207. International shipping is a continuation of the transportation within a country.
- a. Railroads carry goods to docks where they are loaded on boats.
 - b. Trucks transport goods unloaded from ships to inland centers.
 - c. Mules, camels, yaks and donkeys carry goods overland to be loaded on boats.
208. The shipping industry is vital to the welfare of nations, to international goodwill and is most essential in time of emergency or war.
- a. Peoples of the world become friends through international shipping.
 - b. Ships carry assistance to countries during an emergency.
 - c. Troops are transported on ships during war.
209. Inland waterways are usually changed to make them more useful.
- a. Rivers are widened and deepened.
 - b. Canals are built to connect inland waterways.
 - c. Dams are placed in rivers to create lakes.
210. Natural waterways need canals and other improvements.
- a. Longer water routes are possible with canals to connect lakes.
 - b. Canals connect rivers with the ocean.

- c. Canals provide transportation where there are no rivers.
211. Improvement of inland waters for one use improves them for other uses.
- a. Lakes created in rivers by dams are used for recreational purposes.
 - b. Lakes provide storage for irrigation water.
 - c. Sleds are used on canals when the water is frozen.
212. The cost of river and canal transportation includes the cost of providing and maintaining improved channels and terminal facilities as well as the cost of providing and maintaining and operating boats and barges.
- a. Boats and barges cannot operate without adequate terminal facilities for loading and unloading passengers and freight.
 - b. Governments assess taxes on private shippers to pay costs of improving waterways. Tolls are collected for use of locks and canals.
 - c. Operators of water transport add costs to shipping charges and passenger fares.
213. The chief advantage of water transportation is that waterways offer less resistance to traction at moderate speeds than does the road.
- a. Less fuel is needed where resistance is less.
 - b. Inland boats travel at slower speeds than automotive vehicles, so can take advantage of the lessened resistance.
 - c. Inland waterways are ideal for barges loaded with heavy freight. One towboat may push ten or more barges lashed together as a single unit.
214. There are comparatively few places with river and canal transportation.
- a. Many rivers are not navigable because of rapids.

- b. Dams across rivers hamper navigation.
 - c. Many areas have no water suitable for navigation.
215. Transportation on rivers and canals may be hindered or stopped because of weather conditions.
- a. Ice in winter stops inland water transportation.
 - b. Hot weather may cause the water in rivers to drop so navigation is not possible.
 - c. Boats called "ice-breakers" are used on the Great Lakes to break a passage through the ice.
216. Inland waterways are used chiefly for carrying bulk goods in raw form rather than finished products.
- a. Coal is shipped on barges from Pennsylvania to Indiana.
 - b. Sulfur and petroleum is loaded on barges and pulled up the Mississippi River by tugboats.
 - c. Logs are transported by water to mills.
217. Passenger service on inland waters is chiefly by ferry or special excursion boats.
- a. Ferries take passengers across rivers and lakes.
 - b. Special excursion boats operate on the Mississippi River.
 - c. "Moonlight excursions" are featured by boats operating on Lake Michigan out of Chicago.

Air Transportation, General

218. Air transportation is rapidly developing. Air transportation is making great changes in the lives of men.
- a. Stronger lightweight metals are being made because the aircraft industry needed them.

- b. Jet propulsion was developed because aviation was searching for powerful engines.
 - c. Radar was invented for protection against aircraft in war.
219. Air carriers transport fewer passengers than other modes of transportation.
- a. Airplanes have limited capacity in comparison to trains and steamships.
 - b. Air transport is too expensive for many people.
 - c. Some people feel that transport by ships and trains is safer than by airplanes.
220. Every important nation of the world is developing air transportation.
- a. Presently a race is on to see which country will be the first to build a passenger plane with greatly increased passenger capacity.
 - b. Government funds are used to assist airplane companies to carry on research.
 - c. Each country is anxious to receive its share of the increasing air transportation.
221. Airplane travel between countries is increasing very fast. Many passengers are traveling on airplanes instead of steamships.
- a. Modern economy of nations is international and business has to be transacted in many countries necessitating fast passenger service.
 - b. People desire to spend even short vacations in other countries and do not want to use their vacation time for travel.
 - c. Planned tours using air transportation are used by many people.
222. Air transportation has increased the amount of business carried on between the people of different countries.

- a. Investments in foreign countries is encouraged by rapid transportation.
 - b. Buyers of airplane parts fly to Europe and Japan to transact business.
 - c. Many industries have established branch offices in other countries because air travel enables them to carry on business.
223. A large amount of trade between countries is necessary for a large air transport industry.
- a. The air transport industry cannot develop without funds for research.
 - b. Expenses are high for operating air transport carriers, so a large volume of business is necessary.
 - c. Many countries have to buy their planes from other countries, which adds to the expense.
224. Air transportation develops in areas of large cities and many industries.
- a. Primitive areas cannot support air transportation.
 - b. Areas of dense population have many air transportation customers.
 - c. Industry depends upon air transportation for many products.
225. Airplane builders need to know the desires of the customers.
- a. Passengers expressed a desire for more room, so planes were built to accommodate them.
 - b. Passengers like to fly higher, away from storms, so more jet planes were used.
 - c. Passengers wanted meals served to save time at their destination and facilities were installed to provide this service.
226. Modern airplanes can fly higher, stay longer in the air, and have fewer engine failures than the airplanes of the past.

- a. A large portion of an airplane company's budget is used to carry on research for safety features.
 - b. A jet airliner can carry passengers from Calcutta, India to Chicago in 15 hours.
 - c. Airplanes can fly faster than sound and can zoom many miles above the earth.
227. Air transport is less hindered by the geography of a country and does not require investment in tracks or roads.
- a. Airplanes fly over the highest mountains.
 - b. Airplanes use a polar route to save time.
 - c. Radio and radar guide airplanes to safe landings.
228. Airlines will expand in the ratio they find more ways for people to use air transport.
- a. Cheaper freight rates will attract more customers.
 - b. Additional helicopter service at airports will attract people who dislike long limousine or taxi rides.
 - c. Transportation of zoo animals could be encouraged by providing more facilities.
229. A larger variety of goods are carried by air freight than are transported by air express.
- a. Air express is too expensive for heavy bulky articles.
 - b. Military supplies are sent by air freight.
 - c. Emergency feed for cattle during storms is carried by air freight.
230. Trains provide more spacious accommodations per person than is possible on airplanes.
- a. Powerful diesel-electric locomotives easily pull a train with many cars.

- b. New coaches are built larger and each passenger has more room.
 - c. The train passenger has his seat or compartment on the train and may also use the lounge and dining car.
231. Air express is used chiefly for small, valuable goods or those which require fast shipment.
- a. Repair parts or important papers are often sent by air express.
 - b. Medicines are sent by air express.
 - c. Emergencies may exist where the cost of shipping by air express is offset by the speed of transportation.
232. Charges for air express rates are based on the size, weight, and value of the goods and upon the distance transported.
- a. Valuable goods require high-priced insurance.
 - b. Bulky articles use valuable space.
 - c. Rates are based on distance, because travel expenses are greater.
233. The rates and fares for airlines are substantially higher than the rates for ground carriers.
- a. Less space is available in planes than in trains.
 - b. Costs are greater for operating airplanes than buses.
 - c. Airplanes are expensive to build.
234. Changes are being made in all forms of transportation, but more are being made in air transport.
- a. Powerful jet engines are being planned to power airplanes.
 - b. Research is necessary to find metals which will withstand the heat produced when planes are traveling at such great speeds.

- c. Trains and steamships are continually making changes to improve their vehicles and service.
235. Because of its speed, the airplane is especially suited for long-distance transportation.
- a. Short trips are too expensive by air for most people.
 - b. Land and water transportation require too much time in transit for long-distance business trips.
 - c. On short trips, passengers lose time gained by air transport getting to and from the airports.
236. Speed of travel has made air transportation important.
- a. No other means of transportation can compare with the speed of airplanes.
 - b. Airplanes have made the distance between all points of the earth reckoned in hours and minutes rather than miles.
 - c. Doctors and drugs are flown rapidly to many places never before reached by medical science.
237. Passenger transportation by air has overwhelming advantages whenever speed is the primary consideration.
- a. Airplane is man's fastest way of traveling from place to place.
 - b. Airplanes have literally "shrunk" the earth by making possible travel to all parts of it within a short time.
 - c. Military planes need speed for their operations.
238. Air transportation can give services which are not available with other types of transportation.
- a. Machinery sent by air freight arrives in a short time where it is needed.

- b. Articles sent by air transport can be transferred to city centers by helicopters, making the time needed for transport even less.
 - c. Valuable animals can be transported from Africa to zoos in the United States in a few hours.
239. Certain kinds of express and freight need fast air transportation.
- a. Perishable products need fast air transportation if their price will allow the extra expense.
 - b. Business papers and letters may require immediate attention or signatures.
 - c. Important machines may be held up from work because parts are needed.
240. Airplanes flying at high altitudes can go faster and are less bothered by weather conditions.
- a. Storms are in the air close to the earth.
 - b. Jet engines made possible greater speeds of airplanes.
 - c. Only aircraft can fly over the polar route which is the shortest distance between many places in the Northern Hemisphere.
241. Airplanes are especially useful for overseas transportation.
- a. Water transport is too slow for people desiring to transact business overseas.
 - b. The military needs of a country require fast transportation overseas.
 - c. Emergencies require fast transportation.
242. Airplanes have limited capacity, but can make more trips in a short time giving them a high rate of ton-miles or passenger-miles of transportation.
- a. A plane can carry passengers across the United States in a few hours and return with another load.

- b. Freight shipments are carried rapidly and the plane makes frequent trips.
 - c. Airplanes can make several trips across the ocean while a boat is making one.
243. Airplanes can reach areas which cannot be serviced by surface transportation.
- a. Airplanes can land in jungle clearings.
 - b. Mountainous areas have landing strips.
 - c. Airplanes can carry supplies to regions shut in with ice and snow.
244. Frequent flights are scheduled often even though the total volume of traffic is not large.
- a. The airplane can make a flight and return in a short time.
 - b. Flights must be made even though the passenger load is small.
 - c. Frequent flights add to the usefulness of a plane.
245. Land planes are also suited to over-ocean flying.
- a. A plane landing in London may fly non-stop to Vancouver, Canada.
 - b. Planes which fly from New York City to San Francisco may continue over-ocean to Tokyo, Japan.
 - c. Planes from Seattle, Washington fly over the North Pole enroute to Scandinavian countries.
246. Air travel has increased partly because improvements in airplanes have made air transportation more comfortable and pleasant.
- a. Jet planes fly more smoothly.
 - b. Roomier seats are available at a slight increase in fare, if one desires them.
 - c. Entertainment is available with plays on television or radio music on many flights.

247. Adequate airports are necessary for aviation.
- a. Landing fields have to be enlarged as planes are made bigger.
 - b. Control tower operators use radar and instrument landing systems to help pilots land.
 - c. Passengers and freight need airport facilities.
248. Aviation can progress only as rapidly as ground facilities permit.
- a. Planes will not schedule flights to centers without airports.
 - b. Weather reporting stations are important to safety in air transportation.
 - c. Air route traffic control centers are operated to prevent collisions in the air.
249. Airports are being enlarged and improved as airplane designs are changed.
- a. Offices are needed for the large number of persons employed at the airports.
 - b. Runways for jets have to be about 10,000 feet long and much stronger than is necessary for propeller-driven airplanes.
 - c. Military air bases used by the armed forces have longer, wider, and thicker runways than the ones at civilian airports.
250. Seaplanes need the same land facilities as airplanes, but also require facilities for taking off and landing in the water.
- a. Seaplane bases may be located on bays, rivers, or lakes.
 - b. On-shore facilities are necessary to service the planes.
 - c. Seaplanes use pontoons for landing, but have to be brought to the terminal base.
251. Selection of a site for an airport is important.

- a. Central location in regard to the city or cities which it serves is a factor.
 - b. Sufficient area for expansion is required.
 - c. A site that is free from fog is desirable.
252. Aircraft are dependent upon the earth for landing and taking off and also for guidance and safety while in flight and for emergency landings.
- a. Employees in a tower high above the ground supervise all movements of the planes in accordance with the Federal Aviation Agency regulations.
 - b. Hangars provide space to store, maintain and repair airplanes.
 - c. Weather information is provided to pilots in forecasts several times daily.
253. Airways, properly maintained, are absolutely necessary for public carrier aircraft and also for privately-owned aircraft.
- a. The United States government established the Federal Airways system, a network of airways.
 - b. Intermediate landing fields were built for emergency landing.
 - c. Standard international landing, take-off, flight and communications procedure are used to insure safety for the airplanes.
254. The travel time between an airport and the city center is more important than the distance between them.
- a. Traffic congestion may increase the time required to travel between city center and the airport.
 - b. Rapid transit systems operate to and from the airports in large cities.
 - c. Helicopter service is available at many airports.

255. Air service must be safe for people to want to use it.
- a. People will choose slower modes of transportation.
 - b. Vacations will be changed to nearby spots.
 - c. Business will be transacted by letter and telephone if air travel is not considered safe.
256. Safety in air transportation depends upon many things such as: (a) proper equipment properly maintained; (b) pilot skill and intelligence; (c) skillful dispatching and adequate flight control; (d) adequate airway and airport; (e) adequate weather forecasting and reporting; (f) the making and enforcing of rules to promote safety.
- a. Airplanes need to be checked thoroughly and often.
 - b. Pilots take severe physical and mental tests and complete extensive courses of instruction.
 - c. Federal agencies license pilots and concern themselves with the airworthiness of the aircraft.
257. Safety is one of the most important factors in the development of air transportation.
- a. Many lives are lost when passenger planes have accidents.
 - b. Planes are costly to build and repair.
 - c. The public loses confidence in air transport.
258. Scheduled airlines have decreased the dangers of travel through improvements in planes, airports, communications, navigation facilities and by maintaining high standards of training and experience for pilots.
- a. Some aviation companies maintain their weather forecasting service.
 - b. Specialized training is required for mechanics, flight dispatchers, meteorologists, radio operators, as well as for pilots.

- c. Heaters are used to prevent ice from forming on the wings, control surfaces, propellers, and windshields and in the engine carburetors, or on the air-intake screens on jets.
259. An aim is for fewer mistakes and less costly ones in the operation of aircraft.
- a. Pilots have physical examinations often to insure their fitness.
 - b. Improved communications systems assist the pilot to keep on his course.
 - c. Flight instruments are constantly being improved and devices are added to warn the pilot of malfunctioning of some part of the plane.
260. Airplanes have better safety records than airships, because airships are lighter and more subject to accident from wind pressure.
- a. Airships crashed during storms.
 - b. The Navy abandoned its airship program.
 - c. Airships built in European countries had a poor safety record.

Highway Transportation, General

261. Automotive transportation has developed along two lines--property carrying and passenger carrying.
- a. Buses serve as a main means of transporting people between cities in many parts of the world.
 - b. There are about one million trucks called contract carriers that haul goods for other people.
 - c. Small trucks are used for inter-city transport.
262. Motor transportation has made many changes in industry.
- a. Trucks provide rapid transportation between the manufacturer and the consumer.

- b. Refrigerated trucks enable industries to deliver perishable goods unharmed to their buyers.
 - c. Less handling of goods is necessary with motor transportation.
263. Motor vehicles of all types are important in the transportation systems of every country.
- a. Taxis provide convenient transportation for train and air travelers when they arrive at their destination.
 - b. Buses transport people in the city, and in rural areas and operate across national boundary lines.
 - c. Trucks operate on schedule to transport freight between cities.
264. The automobile has completely changed transportation.
- a. The United States has been called "a nation on wheels," because its people own about 62,000,000 automobiles.
 - b. The average American today travels 50 times as far as he did in 1900.
 - c. The automobile has become the backbone of the transportation system.
265. Highway motor transportation is chiefly by privately-owned carriers.
- a. Many trucking firms have one owner.
 - b. Privately-owned automobiles form the bulk of the highway motor transportation.
 - c. Campers transport many people.
266. Highway transportation has grown rapidly because of the development of (1) the automobile gas engine, (2) improvements in automobiles and trucks, (3) gasoline and oil, (4) inflated rubber tire, (5) highways.
- a. Highway improvements make travel by automobile or bus more pleasurable and faster.

- b. The inflated rubber tire made automobile riding more comfortable and helped to make the cars last longer.
 - c. Gasoline and oil are plentiful in the United States.
267. Long distance motor transportation develops in areas of large population.
- a. Large centers of population require many products that can be transported easily by motor freight.
 - b. Large cities need transportation for their population to and from other areas for business and pleasure.
 - c. Products from factories have to be sent to markets in many places.
268. Local motor carriers supplement and compete with other transportation agencies.
- a. Buses compete with and supplement subway trains.
 - b. Buses compete with trains.
 - c. Trucks compete with trains.
269. The volume and type of highway transportation changes often.
- a. Many trucks travel at night.
 - b. Weekends and holidays bring many automobiles to highways.
 - c. Campers and automobiles hauling boats and trailers are on the road on weekends and during summer vacation periods.
270. Automotive transportation is necessary for a country's defense.
- a. Men and supplies are transported in trucks.
 - b. Trucks and jeeps are used at training bases.
 - c. Artillery travels mainly by heavy trucks and tractors.

271. The trucking business has grown because of improvements in trucks and because this type of transport has many advantages.
- a. Trucks, known as tractor and trailer, haul large loads.
 - b. Inter-city trucks haul goods in door-to-door service safely.
 - c. Furniture can be hauled safely in vans without being crated.
272. Motor vehicles may be classified according to their physical characteristics or according to the nature of their use.
- a. Tank trucks carry liquids.
 - b. Bookmobiles contain traveling libraries.
 - c. A panel is a small, fully-enclosed truck.
273. A motor freight company may have one truck or many trucks using a large number of workers.
- a. Single owners may operate one truck for hire.
 - b. Transfer companies may operate a fleet of trucks employing many workers as drivers, mechanics, helpers and office personnel.
 - c. Terminals for freight companies are busy places where many people are employed.
274. Truck transport is possible for almost any type of goods, but is definitely limited by costs and highway restrictions.
- a. Other carriers can operate for less than trucks.
 - b. Restrictions limit the weight allowed on highways.
 - c. Truck owners pay high license charges.
275. Commodities, formerly transported by trains, are being moved by trucks.
- a. Trucks are being designed to carry larger loads.

- b. Higher costs of truck transportation are offset by less handling.
 - c. Shippers use truck transport so commodities can reach markets faster.
276. Owners of freight motor carriers are largely small scale operators with small investments and high costs.
- a. Many operators own and operate a single truck carrier.
 - b. Small operators have high costs in comparison with the volume of business.
 - c. Small operators are usually limited in the area they serve and their income is small.
277. Motor carriers are especially adapted for short hauls, small loads and for short haul passenger service.
- a. Small loads cannot pay the additional handling costs required for rail transport.
 - b. Motor carriers make frequent stops to pick up and load commodities.
 - c. Motor carriers take passengers close to their destination.
278. Motor trucks transport goods formerly hauled by other carriers.
- a. Trucks use ferries to continue land routes; consequently, goods are handled less.
 - b. Trucks are faster than some other carriers.
 - c. Many industries own motor trucks and haul their goods.
279. The length of haul determines which commodities can be shipped profitably by truck.
- a. Coal can be shipped cheaper by water or rail.
 - b. Farm machinery is too heavy and bulky to send by truck over long distances.

- c. Hay is hauled in trucks for short distances, but is cheaper by rail for long hauls.
280. The four primary benefits of motor truck transportation are: speed; economy, reliability, and convenience.
- a. Speed is important for produce shipment.
 - b. Freight trucks are convenient for transporting household goods.
 - c. Motor trucks pick up produce at the farms and unload at city markets.
281. Motor freight transportation is especially adapted to changing conditions and needs.
- a. Trucks are designed to carry any type of cargo.
 - b. Motor freight transportation follows the highways and can accommodate areas where there are no other carriers.
 - c. Cargo is unloaded from boats to freight trucks and transported directly to its destination.
282. Trucks have an advantage, because highways are built in areas where there are no railroads.
- a. Railroad companies cannot afford to build new lines in sparsely-settled areas.
 - b. Highways are built at government expense.
 - c. Other motor vehicles use toll highways and share the costs.
283. Each motor freight unit is small and does not require a large investment.
- a. Many trucks can be purchased for the amount invested in one locomotive.
 - b. Many small trucks are used for freight transport.
 - c. One plane costs several million dollars compared to an investment of several thousands in a truck.

284. Truck operations cannot compete with railroads in handling volume shipments because trucks have limited capacity and require a separate power plant and driver for each truck. On short hauls, lower terminal costs give trucks an advantage.
- a. A small crew can operate a train with many cars.
 - b. Motor freight terminals cost less to maintain than those of railroads.
 - c. One engine can pull many freight cars in one trip.
285. Trucks can operate economically in areas where the volume of freight is too light for railroads to operate profitably.
- a. Motor trucks service small logging towns.
 - b. Truck lines operate in newly settled farming communities.
 - c. Government projects are often built where there is no rail service.
286. Motor truck transportation has advantages for the movement of certain kinds of freight.
- a. Emergency repairs for machinery can be transported quickly.
 - b. Highway construction machinery can be transported more easily by trucks.
 - c. Perishable products can be transported advantageously by motor trucks.
287. The speed and flexibility of trucks enable them to be substituted for trains during a rail equipment shortage.
- a. Trains may not have equipment due to labor strikes.
 - b. Trains are not always able to meet wartime needs for transportation.
 - c. Railroad companies do not always expand fast enough to meet the transportation needs in certain areas.

288. The smaller size of the bus makes frequent trips possible.
- a. Large trains cannot afford to make short trips.
 - b. Costs of maintenance are not as great for small vehicles.
 - c. Buses can travel in downtown traffic.
289. The motor bus is a convenient carrier in rural areas.
- a. Buses operate in areas where there are few inhabitants.
 - b. Bus terminals in rural areas are convenient for the residents.
 - c. Buses carry rural residents to their work in cities.
290. Motor carriers usually have dependable schedules.
- a. Highways are kept clear of ice and snow in winter.
 - b. The majority of the motor carriers operate within a limited area.
 - c. Motor carriers are not usually detained by fog, rain, wind or smog.
291. Provision for terminals presents a problem for motor carriers.
- a. Terminals are expensive to maintain where the volume of business is limited.
 - b. Cafes, stores, etc. are utilized for terminals.
 - c. Many terminals are not open at night.
292. Terminals are built to meet the needs of the trucking industry.
- a. Large volume transport requires larger storage facilities.
 - b. Transport of perishable products requires refrigeration facilities at some terminals.

- c. Provision for mechanical services is necessary at the large terminals.
293. Many factors are considered in the location of a terminal in an urban area.
- a. Traffic congestion must be considered.
 - b. City zoning ordinances may restrict locations to certain areas in the city.
 - c. Terminals need to have easy access to the highways.
294. Motor carriers provide service to areas where terminals are not maintained.
- a. Buses make stops at designated places along the highway.
 - b. Places of business are used for bus terminals.
 - c. Small trucks operating from the large terminals maintain delivery service to urban areas.
295. The cost of maintaining motor carrier terminals is high per ton mile.
- a. Even large trucks are limited in carrying capacity.
 - b. Labor costs for maintaining terminals are expensive.
 - c. Construction costs for building terminals are high.
296. Trucks have less delay than trains at their terminals.
- a. Single units are easily loaded and unloaded.
 - b. It takes less time to service trucks than trains.
 - c. Trucks haul many products directly from shipper to destination without stops for unloading at terminals.

Railroad Transportation, General

297. Railroads made cheap transportation for most areas of the earth.
- a. Coal for steam engines was available.
 - b. Railroads were built in almost every country.
 - c. Railroads increased the economy of the country and in turn, more railroads were needed and built.
298. The construction of a railroad of any consequence requires heavy expenditures.
- a. Building tracks is expensive.
 - b. Locomotives and cars add to the costs of railroads.
 - c. Land for right of ways has to be purchased.
299. Railroads carry most of the inland freight in modern countries.
- a. Large quantities of raw products for industry need rail transport.
 - b. Farm produce is transported by rail.
 - c. Products of industry are distributed by rail transport.
300. The perfect railroad line to operate would be level and straight.
- a. Trains could travel much faster on straight lines.
 - b. Less fuel would be required to operate trains on level lines.
 - c. Smaller locomotives could be put in use on straight level lines.
301. The limits of the steam engine have not been reached.
- a. Steam is a cheap source of power.
 - b. Steam can be produced with different kinds of fuel.

- c. Steam power is available nearly everywhere.
302. Railroads can be built in any place where transportation business will pay the costs.
- a. Tunnels can be built through mountains.
 - b. Trestles and bridges can cross waterways.
 - c. Heavy equipment is used where physical barriers would ordinarily stop construction.
303. Railroads are good carriers for large volumes of goods transported for long distances.
- a. Extra freight cars can be added to a train without greatly increasing the cost.
 - b. Freight cars are large, so they can carry large volumes of goods.
 - c. Railroads are especially well adapted to handling big and heavy shipments.
304. Railroad trains cannot operate as frequently as air carriers.
- a. Trains do not travel as fast, so require more time for round trips than do airplanes.
 - b. Trains must follow tracks, but planes can take the shortest route.
 - c. Most railroad traffic is over long distances.
305. Railroad costs are too high for trains to operate where there are few passengers or small shipments of freight.
- a. Train travel involves the work of many individuals who must be paid.
 - b. Maintenance of track is very expensive.
 - c. Building and maintaining terminals is expensive.
306. Freight hauling is the chief source of income for the railroads.

- a. Railroads are the main transporters of all livestock.
 - b. Nearly every coal mine in the United States is served by railroad transport.
 - c. Railroads haul half of the freight transported in the United States.
307. Railroads are located where there is or will be business.
- a. Train tracks are usually between the main cities.
 - b. Many towns have grown because they were located on a train route.
 - c. Chicago has become a main city of trade because it is a connecting point for many railroads.
308. Railroad tracks are built to support the load and to provide a smooth surface for the wheels.
- a. The tracks must support the heavily loaded cars.
 - b. Smooth, unobstructed tracks provide a safer and faster transportation.
 - c. Railroad tracks are made of heavy steel.
309. Railroads cannot be used for other purposes than transportation if their operation is not profitable.
- a. Railroad plants cannot be converted to suit the needs of other businesses.
 - b. No other mode of transportation can use the railroad tracks.
 - c. The operators of railroads cannot easily move their centers of business.
310. Railroads cannot afford to make stops where there are few passengers or small freight shipments.
- a. Frequent stops slow down transport time requiring more time for goods to reach the consumer.

- b. Even though freight shipments are small, they require individuals to load them, which is expensive.
 - c. Stations cannot be maintained for a small number of passengers.
311. Railroads have elements of both competition and monopoly.
- a. Railroad lines compete with each other to some extent.
 - b. Railroad lines compete with other forms of transportation.
 - c. In many areas there is one railroad line, thereby giving it a monopoly on rail transport.
312. The motor bus and the passenger automobile compete with the trains for passenger service.
- a. Buses have more convenient schedules.
 - b. An automobile does not have any definite schedule.
 - c. Buses and cars can stop along the way for sightseeing.
313. Passenger trains aim to have speed, frequency, safety and convenience.
- a. Scheduling is done quickly by machines to avoid delay.
 - b. Trains stop at many points so terminals are conveniently located.
 - c. Maintenance crews are hired to keep the cars and track safe.
314. Railroads need many passengers to operate economically.
- a. Terminals are expensive to operate.
 - b. Railroads have huge capital investments.
 - c. Large sums are paid to maintenance and operating crews.

315. Railroads are better than buses for long trips but airplanes are superior to railroads.
- a. Meals are served on trains enabling the passenger to eat without getting off the train.
 - b. Pullman and sleeping cars provide comfortable sleeping facilities for long trips.
 - c. Planes deliver passengers to their destination much faster than buses or trains.
316. Railroad passenger service is faster than bus service over long distances.
- a. Trains do not make meal stops.
 - b. Trains stop at fewer towns.
 - c. Railroads are not detained by traffic.
317. Most of the railroad passenger business comes from comparatively low fares per person carried.
- a. Railroads offer considerable reductions in fares when round-trip tickets are purchased and for family groups.
 - b. Trains traveling to recreational areas offer lowered fares.
 - c. Special rates are offered on excursion trains traveling to many areas of interest.

Pipeline Transportation

318. Pipeline transportation development is a part of petroleum industry development.
- a. Increased use of petroleum products required additional transportation facilities.
 - b. Petroleum companies built pipelines to aid in the expansion of their industry.
 - c. Petroleum can be transported by pipeline directly to refineries from oil wells.

319. Pipelines are used only for transporting freight in liquid and gaseous form.
- a. Petroleum products are transported in pipelines.
 - b. Pipelines are used to transport natural gas.
 - c. Crushed coal, mixed with water is transported in pipelines.
320. Modern pipeline transportation is economical and dependable.
- a. Pipelines have comparatively low maintenance costs.
 - b. Large pipelines can deliver 1,500 truck loads of crude oil in one day.
 - c. A pipeline can carry several materials at one time.
321. Pipeline transportation is less influenced by weather than any other type of transportation.
- a. Pipelines are generally underground.
 - b. Products transported by pipelines are not easily affected by weather conditions.
 - c. Some pipelines are placed undersea.
322. Products are pumped through pipelines or they flow through from gravity.
- a. No vehicle is required to transport products through pipelines.
 - b. Pumps, powered by diesel engines or electric motors, draw petroleum through the pipelines.
 - c. Early pipelines depended upon gravity and natural pressures to move fuels.
323. Tank vessels compare favorably with pipelines in costs of operation.
- a. The huge volume of tank vessel petroleum transportation lessens the cost.

- b. The cost of rights of way are added to pipeline transportation charges.
 - c. Tank vessels do not require maintenance of their routes.
324. Pipeline costs are less than railroad costs for transporting petroleum products.
- a. Railroads require huge capital expenditures.
 - b. Pipelines require less maintenance than railroads.
 - c. Trains are powered with expensive locomotives.
325. A number of factors influences the low costs of transportation by pipeline.
- a. Little labor is required.
 - b. Pipelines are used for storage when not needed for transport.
 - c. Movement of products through pipelines is continuous.
326. Refineries are located at distant points from oil fields because petroleum can be easily transported by pipelines.
- a. Refineries are located close to urban centers where the products are used.
 - b. Labor is more available close to urban centers.
 - c. Research centers are located in larger cities.
327. The amount of traffic handled has little bearing on the cost of operating pipelines.
- a. The cost of operating the pumps does not increase materially with greater traffic.
 - b. Airplane observers patrol pipelines regardless of traffic volume.
 - c. The number of employees does not vary with the traffic volume.

328. Many factors influence the cost of pipeline construction.
- a. Rights of way have to be purchased.
 - b. Clearing the land is more expensive in certain areas.
 - c. Surveying for pipelines is more expensive in mountainous areas.
329. Railroads compete with pipelines for transportation of gasoline and other liquid products of petroleum.
- a. Pipeline rates influence rates charged by railroads.
 - b. Railroad tank cars carry 8,000 to 10,000 gallons of gasoline.
 - c. Railroads service some areas where there are no pipelines.
330. Pipeline transportation of oil is far superior to railroad transportation where its inflexibility is not a factor.
- a. Pipelines are limited in size.
 - b. Pipelines can be built into practically any land area.
 - c. Pipelines carry more oil than any other form of transportation.
331. Improvements in pipe construction and methods of trenching have facilitated long-distance natural gas transportation.
- a. There are more than 600,000 miles of natural gas pipelines in the United States.
 - b. The pipeline industry developed after seamless and electrically welded steel pipe became available.
 - c. Leaky gas lines cause losses to industry.
332. Rights of way must be obtained from property owners before lines can be constructed.

- a. Pipelines cross private property.
 - b. Owners may be reluctant to have gas lines constructed through their property.
 - c. Rights of way across desert or waste land would not be expensive.
333. Pipelines are usually owned by oil companies and are used primarily to transport products of the companies that own them.
- a. Oil companies built the first pipelines.
 - b. Pipelines were necessary for the huge expansion of the petroleum industry.
 - c. Capital is available to build pipelines because the petroleum industry is one of the largest in the country.
334. Pipelines are located in reference to the location of oil wells, refineries and storage plants.
- a. Pipelines carry oil from Texas to Pennsylvania.
 - b. Russia's Comecon oil pipeline brings oil from the Urals into East Europe.
 - c. Pipelines were built from Saudi Arabia to Lebanon.
335. Pipelines use a telephonic dispatching system and maintenance is carefully organized.
- a. Pipelines use telegraph, telephone and radio dispatching.
 - b. Radioactive material is injected into the head of a batch of oil and a Geiger counter is used to record when the oil has reached its destination.
 - c. Airplanes are used to patrol modern, high-pressure pipelines.
336. The use of natural gas has increased tremendously because of long-distance transportation.
- a. Gas is used in urban centers far from its source.

- b. The length of natural gas pipelines in the United States is twice that of railroads.
- c. Natural gas is used in thousands of industrial plants and in millions of homes.

Urban Transportation

337. Rapid transit is an economic and social asset to a community.
- a. Rapid transit allows business to be transacted faster.
 - b. Traffic conditions in a city are improved because fewer automobiles are required.
 - c. Residents can take advantage of cultural opportunities in a city.
338. Surface transport in the largest cities is not sufficient.
- a. Elevated trains operate above the streets.
 - b. Subway systems carry many passengers long distances.
 - c. Helicopter service is used to transport plane passengers to city centers.
339. Rapid transit facilities need to be integrated with other city transportation.
- a. Passengers must have transportation to the rapid transit depots.
 - b. People who come to the city via rapid transit need transportation about the city.
 - c. Railroad, bus and airline terminals require rapid transit facilities to the city centers.
340. Rapid transit transportation has developed because of increased traffic in city centers.
- a. The public often dislikes driving in downtown traffic.

- b. People not acquainted with the city streets like to use rapid transit transportation.
 - c. Rapid transit is much faster than cars in heavy traffic.
341. Property in outlying districts increases in value with rapid transit to that area.
- a. Outlying districts become more accessible.
 - b. Rapid transit brings people in the outer districts closer to their jobs.
 - c. Persons desiring to live away from city centers use rapid transit transportation.
342. The size of the city determines the type of rapid transit used.
- a. In large, well-developed cities rapid transit must travel underground.
 - b. Large cities require very fast means of transportation to travel greater distances quickly.
 - c. Where few stops are required a monorail may be used.
343. Competition exists among local motor freight companies.
- a. In most cities, several freight companies compete for business.
 - b. Large cities with more business encourage more transit companies.
 - c. Each company tries to offer better service so it will receive more business.
344. Rapid transit transportation must be safe.
- a. The public will not travel on a certain mode of transportation if it is not safe.
 - b. Goods must arrive at their destination unharmed.
 - c. Rapid transit companies would be liable for injuries or for damaged goods.

345. Use of the modern transit-type motor bus has had a great influence on city transportation service.
- a. Local buses carry many passengers for short distances.
 - b. Buses make it easier for people to shop in the downtown area.
 - c. The motor bus is flexible in its operation because it is not restricted to rails.
346. The trolley bus has qualities of both the gasoline motor bus and the electric car.
- a. The trolley is dependent upon electric lines for power.
 - b. The trolley, like the motor bus, carries many passengers.
 - c. The trolley isn't limited to a ground track.
347. Buses are cheaper to install than street railway systems and are more flexible.
- a. Buses do not require tracks.
 - b. Buses use the same streets as the general public and share the cost with them.
 - c. Locomotives are more expensive than buses.
348. Buses can load passengers at the curb and can detour around obstructions.
- a. Buses do not require special loading platforms.
 - b. Buses are not restricted to a particular road or street.
 - c. Buses have built-in power systems.
349. A city bus must operate on its own power.
- a. Buses usually use gasoline or diesel oil; some use liquefied-petroleum gas.
 - b. City buses do not require lines to electric power.

- c. City buses do not depend upon a centralized power plant.
350. Buses are important in transit operations for many reasons.
- a. Buses offer through service to off-route locations.
 - b. Buses are flexible in traffic.
 - c. Buses schedule frequent trips.
351. Motor buses provide transportation to areas which do not have other transportation facilities.
- a. Buses service areas which are not large enough to support airline traffic.
 - b. Since buses are not restricted to tracks, they can go to any area where highways have been built.
 - c. Bus companies can easily establish service to new or expanding communities.
352. Subways are the most efficient transportation for large numbers of passengers in urban areas.
- a. Subways reduce congested traffic in downtown areas.
 - b. Subways can transport great numbers of people quickly.
 - c. Subways are not delayed by surface traffic regulations.
353. Streetcars provide more capacity for mass transportation during peak periods if they are operated on one-way or wide streets.
- a. On one-way streets traffic is not held up for left turns.
 - b. Wide streets allow more lanes of traffic.
 - c. Traffic moves faster on one-way streets.

III. SOCIO-CULTURAL

Urban Developments

354. Cheap and efficient transportation has contributed to the growth of large cities.
- a. People will come to the city to work if they have cheap, efficient means of transportation.
 - b. Transportation makes possible efficient exchange of goods.
 - c. Efficient transportation fosters large-scale production.
355. Fast transportation carries large numbers of people in and out of the city centers each day.
- a. Many people who work in the city live in suburban areas.
 - b. Housing developments are in suburban areas.
 - c. Residents of apartments and hotels often work in industries located in outlying districts.
356. Metropolitan areas have developed through the combinations of long-distance and short-distance transportation.
- a. Long-distance air, water, and rail transportation brings goods in and out of the cities.
 - b. Rapid transit systems enable large numbers of people to work in the cities.
 - c. Buses and commuter trains service outlying areas.
357. Cities started when transportation was possible and surplus farm products were available.
- a. People in cities are dependent upon farms for food.
 - b. Transportation to and from and within cities is necessary for their growth.

- c. Factories in cities changed farm products into other types of goods.
358. Highly developed transportation systems make possible large urban population.
- a. Food can be transported easily.
 - b. Materials for manufacture are brought from many areas.
 - c. Residents of urban areas can move about freely.
359. The size of a city's population is determined by the development of transportation, availability of raw materials, and markets.
- a. Large cities have extensive transportation facilities.
 - b. Raw materials are nearby or easily transported.
 - c. Markets for industrial products are reached easily.
360. Modern transportation enables people to live farther from their work.
- a. Commuter trains transport many passengers from suburban areas to city centers.
 - b. Business executives use airplanes to travel to work.
 - c. Rapid transit systems operate to outlying districts.
361. City governments control the transportation pattern within the city.
- a. Franchises are given to bus systems.
 - b. Transportation systems are required to give service to all areas within the city.
 - c. Transportation routes must be approved by city officials.

362. Improved transportation created large metropolitan centers, but its use allows people to move away from the city centers.
- a. Cities developed because transportation was available.
 - b. New, fast transportation allows people to live away from traffic, smog and crowded conditions.
 - c. Cities became huge industrial centers because improved transportation brought raw products and transported finished articles to markets.
363. Rapid transportation brings rent increases in areas surrounding large cities because they are desirable for factory and home sites.
- a. When suburban property is in demand, increases in rent occur.
 - b. People could not live out of the city without transportation.
 - c. Factories can locate away from city centers because there is transportation for employees.
364. People enjoy living away from crowded sections of towns.
- a. Suburban living has many advantages for people who have children.
 - b. Crowded sections of town often are not well kept.
 - c. The atmosphere is more restful away from city centers.
365. Nearly all large cities have access to the sea.
- a. Some inland cities have grown large because they are market centers for agricultural regions.
 - b. Development of mining operations has contributed to the growth of some inland cities.

- c. New York, London and Tokyo are examples of large cities with access to the sea.
366. Cities located at important transportation junctions have developed because commerce was encouraged.
- a. Seattle, Washington is a terminal for railroads and a shipping port.
 - b. Many railroads enter Chicago and it is a lake port.
 - c. St. Louis, Missouri has rail and water transportation.
367. Cities are slow in meeting transportation needs.
- a. Downtown traffic is congested.
 - b. Traffic to airports is not adequate.
 - c. Freeway street construction is delayed because of expenses involved.
368. Transportation services compete for space with other uses of land in a city.
- a. Widening streets requires moving of buildings.
 - b. Construction of freeways involves purchasing expensive rights of way.
 - c. Transportation areas have to go through or bypass parks.

Cultural Diffusion

369. Information and ideas are transported in incredibly short time.
- a. The Telestar satellite transmits today's news between Europe and the United States.
 - b. Radar receives information from great distances.
 - c. Through television, people see events of the world as they occur.

370. The application of social and cultural forces is improved by transportation.
- a. Peoples of the earth get to know each other through travel.
 - b. Imports from other nations create a bond of understanding.
 - c. The problems of underprivileged nations are better understood by persons who have visited in their countries.
371. Improved means of transportation and communication have made the world grow smaller.
- a. Modern jet liners cross the United States in five hours.
 - b. Space travel enables man to circle the earth several times each day.
 - c. Food and flowers were growing thousands of miles away a few hours before they are used.
372. "Shrinking of the world" makes it necessary for people everywhere to cooperate in commercial, political, and cultural matters.
- a. Atomic weapons can annihilate whole nations.
 - b. Society benefits when cultural exchanges are made.
 - c. International trade is essential for the economy of nations.
373. Great divergence exists among peoples although modern transportation has made the world one community.
- a. Each nation has its own customs and language.
 - b. Jet airplanes are piloted by men whose fathers are living in grass huts.
 - c. Rescue stations for space travelers are located in remote islands.
374. The groups who are enemies will slowly diminish because modern means of communication and transportation will bring understanding to all people.

- a. Television brings within sight, people of all the earth.
 - b. Radio brings voices of people to each other.
 - c. Airplanes carry people quickly to the farthest ends of the world.
375. All social institutions are affected by transportation.
- a. Man does not stay in one small community.
 - b. People of the earth are interdependent and need goods produced by each other.
 - c. Man needs to travel to carry on commerce, for mercy missions, for exploration and education and for pleasure.
376. Social institutions have grown beyond the village and city due to improvement in transportation facilities.
- a. Few people stay within small villages.
 - b. Eskimos in remote regions of Alaska use supplies brought in by airplanes.
 - c. Articles made by hand in mountainous regions of South America are sold in markets of the world.
377. The scope and strength of any institution is partly determined by the use made of modern transportation.
- a. Jungle tribes in Africa have not progressed far.
 - b. Important nations have well-developed means of transportation.
 - c. "New" nations begin to improve transportation facilities.
378. The face of the earth has assumed a new shape and acquired new outlines with increasing speed of travel.
- a. Polar routes are used by planes.

- b. The fastest air route is the shortest route.
 - c. Land and sea routes have no relation to air routes.
379. Greater understanding and cooperation are results of improved transportation.
- a. Inter-racial marriages result from travel in other countries.
 - b. Tastes are acquired for food of other countries.
 - c. Clothing styles of other nations are adopted because of their beauty and comfort.
380. Inventions, especially in transportation and communication, diminish influence of locality.
- a. New inventions require use of raw products from varied regions.
 - b. Ideas and goods are easily exchanged with new media of transportation and communication.
 - c. Travel is possible to areas where it would not have been possible a few years ago.
381. Cheap and efficient transportation has brought rural and urban areas together.
- a. Residents in rural areas shop in cities.
 - b. Workers go freely from one area to the other.
 - c. Residents in rural areas come into the city for recreational and cultural activities.
382. The telephone, automobile, and radio have brought new customs.
- a. People use the telephone instead of visiting friends.
 - b. Automobiles allow families to go farther from home for recreation.
 - c. News brought by radio creates more interest in world affairs.

383. People are able to enjoy cultural advantages due to better transportation facilities.
- a. More people can attend opera and theater performances.
 - b. People can take night classes at college.
 - c. Educational tours are available at reasonable rates.
384. Developments in communication and transportation tend to lessen the differences in dialect, customs and in manners.
- a. As people travel to other communities, their speech tends to become more uniform.
 - b. Customs in a community change as the population becomes more mobile.
 - c. Television and other media help to bring people closer together so they become more alike.
385. Transportation and technological developments take up and discard the materials of nature and affect great changes in the total pattern of community life.
- a. A pipeline brings more than a million tons a year of crushed coal mixed with water from Cadiz, Ohio to an electric power plant in Cleveland.
 - b. Newsprint, manufactured in Canada, is transported to many cities and some of the newspapers printed on it are sold in Canada.
 - c. Spacecraft are flown in specially built airplanes with removable tail assembly parts to Cape Kennedy.

Distribution of Population

386. The pattern of industry and the distribution of population within a nation are determined by transportation development, distribution of resources and the surface features of the country.

- a. Cities grow when transportation is developed.
 - b. Desert and mountainous areas do not develop rapidly.
 - c. Areas located near raw materials develop if transportation is available.
387. Natural features determine growth of population.
- a. Areas with extreme temperatures are less likely to develop.
 - b. Waterways suitable for transportation bring population to an area.
 - c. Timber and mine products attract population to an area.
388. Problems are created because modern transportation makes it easy for people to migrate from less favorable areas.
- a. Some areas become overcrowded with migrant workers.
 - b. New industry attracts workers from many places but schools, highways and other facilities do not keep pace with the mobile population.
 - c. Welfare funds are not always available to help migrant persons who come into areas for seasonal work.
389. Geographic distance prevents social organization even with modern communication and transportation facilities.
- a. In areas of large wheat farms, people live at distances from neighbors.
 - b. Little social organization is possible in mountainous areas.
 - c. Cattle ranchers live too far apart for effective social organization.
390. Migration has taken place rapidly with technological advances.

- a. People move from rural areas to work in factories.
 - b. Areas with highly developed industry attract labor from all parts of the United States and from other countries.
 - c. People are able to earn more as technology increases and they tend to become more mobile.
391. Countries need fast, dependable transportation to defend dependencies.
- a. Dependencies are often many miles from the country which owns them.
 - b. Hostilities over dependencies may lead to war.
 - c. Modern warfare is highly dependent on efficient transportation.
392. The economy and military strength of a nation is affected by the patterns of transportation development.
- a. Emphasis on roads for defense provides impetus to building transcontinental highways.
 - b. The economy of a nation depends upon good transportation.
 - c. Government contracts help airplane industries to develop.
393. Good transportation permits rapid movements of troops and equipment to defend the frontiers.
- a. All forms of transportation are necessary for military needs.
 - b. Government subsidies for military needs encourage growth in the airplane industry.
 - c. Modern warfare requires great mobility of troops and supplies.
394. Warfare can be conducted over a large area through new means of transportation.

- a. Large airplanes carry troops and supplies over great distances in a few hours.
 - b. New means of communication allow messages to be transported quickly to different sectors engaged in warfare.
 - c. Helicopters are used to transport injured military personnel to hospitals.
395. The airplane occupies a dominant position in modern warfare as a fighting machine and is of great value in carrying troops and supplies at high speed over long distances and across difficult terrain.
- a. The airplane first came to importance because of its use in World War I as a fighting machine.
 - b. The United States government is providing huge subsidies to companies to develop the supersonic airplane because it will be of great military importance.
 - c. War is carried on in areas where airplanes are the only means of transportation which can be used.
396. The development of transportation has military importance in peace as well as in war.
- a. The defense of a country requires a strong air force.
 - b. Military personnel are stationed in many areas of the world and need rapid transportation for men and supplies.
 - c. Meetings of key people in government are made possible through air transportation.
397. Merchant ships are an invaluable part of a nation's war-making capacity.
- a. Merchant ships carry raw materials to be used to manufacture war supplies.
 - b. Merchant ships transport petroleum needed for fuel in war machines.

- c. Merchant ships transport huge supplies of food for troops and civilians in countries which are engaged in warfare.

IV. POLITICAL ASPECTS OF TRANSPORTATION

398. Transportation greatly influences the practical size of political and social groups.

- a. In areas where transportation is limited, only small groups can maintain political sovereignty.
- b. Large countries maintain political unity by developing effective means of communication and transportation.
- c. Advanced methods of communication and transportation are necessary to defend the frontiers of large political units.

399. The small locality has enlarged into a region through modern transportation.

- a. Each large city has many suburbs which are in effect a continuation of the city. Los Angeles is a good example with dozens of towns which blend into the Greater Los Angeles area served by rapid transit transport and with many connecting freeways.
- b. Commuter airlines provide rapid transport of people and express to nearby localities.
- c. Buses and trains provide easy transport of people and goods from one locality to another.

400. The unit of political aggregation is an important problem in a world of accelerated transportation and communication.

- a. The United States was deeply concerned during the time of the Cuban missile threat.
- b. The war in Viet Nam has not been accelerated because there is fear of swift retaliation by Chinese Communists.

- c. Instability in any political unit has immediate repercussions throughout the world due to accelerated modes of transportation and communication.

401. Functions of government are becoming more centralized with new inventions in transportation and communication.

- a. New inventions requiring huge funds for development must be financed by larger government units.
- b. Transportation and communication facilities are necessary for a country's defense so their development is a function of the central government.
- c. Functions of government units can be handled easily through modern facilities for communication and transportation.

402. Improved transportation has promoted social unity and contributed to the creation of the political unity of an area.

- a. Nations have formed new independent national governments because modern transportation has allowed the citizens to communicate with each other.
- b. Citizens can participate in their government and know candidates for public office due to improved modes of transportation and communication.
- c. Government officials and heads of organizations are in contact with each area of a country and can act quickly in case of emergencies such as riots, earthquakes, or fires.

403. Each nation must decide whether the construction, maintenance and operation of transport facilities will be carried on by private enterprise or as a function of government.

- a. In Canada and the United States, most of the transport facilities are carried on by private enterprise.

- b. Various types of government subsidies are used to encourage new developments.
- c. Many cities operate surface transport facilities.

V. GEOGRAPHIC ASPECTS OF TRANSPORTATION

Climate

404. Mountains, snow, ice, fog, and storms hamper transportation.
- a. Airplanes cannot land at airports where there is dense fog.
 - b. Snowslides block train and highway transport.
 - c. Building railroads and highways is difficult and expensive in mountainous regions.
405. The location of air routes is affected by climate, weather, atmospheric conditions, and terrain.
- a. Smaller airplanes cannot fly high enough to escape many weather hazards.
 - b. High mountains may have periods with low visibility.
 - c. In mountainous areas, air pressure often varies, creating dangerous conditions for aircraft.
406. Air freight transportation will always be seasonal.
- a. Winter weather conditions prevent definite freight transportation schedules.
 - b. Air freight is hampered by fogs which occur during certain periods of the year.
 - c. Many of the products transported by air freight are seasonal in nature.
407. The steamship is influenced by weather conditions and ocean currents.

- a. Ocean currents determine in a measure the speed of a ship and the quantity of fuel consumed.
- b. Steamships' routes are lengthened to avoid the perils of icebergs.
- c. Weather reports of hurricanes may cause re-routing of steamships.

Surface Topography

408. Transportation and communication are facilitated in a plains area.
- a. It is easier to construct highways and railroads over level land.
 - b. Airplanes have fewer hazards in a plains region.
 - c. Communication is easier over level land than over mountainous terrain.
409. Land bodies are separated by water, but the bodies of water provide a convenient way to transport men, goods, and culture from one land to another.
- a. The culture of early people around the Mediterranean Sea was spread by sailors.
 - b. The ease of water transportation effected racial amalgamation as in the Hawaiian Islands.
 - c. Silk from the Orient became a popular article of trade because it could be transported easily by water.
410. The path of ships is affected by the spherical shape of the earth.
- a. Whenever possible, world shipping paths avoid the longer routes close to the equator.
 - b. Ocean currents are affected by the rotation of the earth and the currents affect routes of ships.

- c. Submarines travel under the polar ice cap to shorten the distance through the Northwest Passage.
411. Coastal areas have had an ecological advantage with the development of ocean travel.
- a. People of many cultures live in harmony in ocean ports, as the Chinese in San Francisco, the Irish in Boston, and the Swedes in Seattle.
 - b. Coastal areas are enriched through the culture of persons traveling from other lands.
 - c. People in coastal areas are not dependent upon the products of their environment because they can easily exchange goods through the development of ocean travel.
412. Regions with topographic barriers have been developed through the use of air transportation.
- a. Alaska is extremely dependent upon air transport.
 - b. South American countries with hazards to surface transport have been developed through the use of airplanes.
 - c. Air transportation has contributed to the growth of cities which are market centers for desert areas.
413. Ocean shipping has natural perils to the safety of navigation.
- a. Hurricanes are a hazard to ships.
 - b. The monsoon season brings perils to water transportation.
 - c. Dense fogs and icebergs are natural perils to the safety of navigation.
414. Mature rivers have fewer obstacles to navigation than young or old ones.
- a. Mature rivers flow more slowly.

- b. Old river beds have been raised by huge deposits of silt creating hazards to navigation.
 - c. Young rivers are apt to have rapids, falls, and steep, narrow banks.
415. Countries with irregular coastlines have an advantage in world commerce if the harbors are favorable for ports.
- a. San Francisco is a large protected seaport.
 - b. Norway has fiords which do not provide good sites for ports because high mountains rise directly from the ocean.
 - c. Alaska has areas of irregular coastline unfavorable for ports because of the northern latitude.
416. Arid lands are effective barriers to transportation so cities have developed on their perimeters.
- a. Tehran became an important center of trade for the desert travelers.
 - b. Cairo is located on the margin of the Egyptian desert.
 - c. Melbourne, on the edge of the Australian "bush" serves as a center of trade for this huge arid area.
417. Mountains form barriers to transportation and thereby to commercial intercourse.
- a. Surface transportation has not developed in Chile and this country has not become important commercially.
 - b. Tibet is isolated because of its inaccessibility due to mountainous terrain.
 - c. Mountains in British Columbia prevent surface transportation and inhibit commerce.
418. Modern developments in transportation and communication have reduced the effects of natural barriers on human movement.

- a. Tunnels are constructed through mountains.
- b. Modern machinery has made possible highway construction in remote areas.
- c. Air transport flies over desert, water and mountains.

419. Water presents serious and sometimes impossible barriers to land transportation.

- a. The waters of Puget Sound are a barrier to land transportation routes in that area.
- b. The Great Lakes prevent easy land access to many points between Canada and the United States.
- c. The waters surrounding the British Isles require the use of water transport to near-by Europe.

Location of Settlements

420. The natural location of a place does not change, but vicinal changes occur with the development of better transportation of natural resources.

- a. Edmonton, Canada experienced prosperity and growth with the development of oil fields and with modern means of distributing petroleum by pipelines and tanker railroad cars.
- b. Maracaibo, Venezuela had made little commercial progress until nearby oil fields were opened and tanker ships transported the petroleum from that port.
- c. Building transcontinental railroads provided impetus to the growth of cities in the western United States that started as trading posts along the cattle drive routes.

421. Sites along rivers have always been desirable for settlements and especially where transportation routes cross rivers.

- a. St. Louis, Missouri became an important cross-roads market and is still the largest fur market in the world.

- b. Land routes cross the Columbia River at Portland, Oregon and river and ocean vessels utilize the port location.
 - c. The location of Memphis, Tennessee as a center of river and land routes has made it a center of western Tennessee and parts of neighboring states.
422. Cities are established and develop at the ends of important passes where there are divergent trade routes.
- a. In early times, Venice became important because merchants brought goods from the Far East and the products were carried by Italian fleets to ports in Spain, England, and Flanders.
 - b. New Orleans was located where river and ocean provided transportation for products of the Mississippi River Valley.
 - c. Cincinnati, Ohio, due to its location, became known as "The Gateway to the South."
423. Favorable locations for trade centers are found at the end of a barrier, where travel routes converge as they are forced to go around the barriers.
- a. Buffalo, New York is located where land routes had to be changed to water transport.
 - b. Seattle, Washington is a western terminal for land routes.
 - c. The area around Chicago, Illinois was important in transportation before the white settlers arrived. The Indians used the region as a portage route.

CHAPTER IV

SUMMARY AND IMPLICATIONS

The intent of this study was to identify concepts applicable to the study of transportation in elementary school social studies programs. The concepts were formulated by examining the generalizations contained in the doctoral dissertation, Transporting People and Goods, prepared by John Franklin Rambeau at Stanford University. The generalizations in this dissertation were written after an extensive search of the literature of the social sciences. This dissertation relating to transportation was one of those prepared by a team of researchers working under the direction of Professors Paul R. Hanna and Richard E. Gross. The dissertations were prepared to assist teachers, curriculum workers, and publishers by listing the significant generalizations that could be used as a check for comprehensiveness and continuity in providing learning opportunities for pupils. The competency of the researchers and the depth of their investigations gave validity to the generalizations in these dissertations.

The generalizations in the Rambeau dissertation were examined to identify concepts which are inherent in the generalizations. These concepts were worded to make them applicable to elementary school social studies programs. Encyclopedias and other materials were used to provide the

facts presented in the examples which accompany each concept. The examples clarify and are compatible with the concept.

Existing textbooks and curriculum guides do not provide sufficient material for teachers and school personnel to organize in detail social studies units based upon the conceptual approach. This study furnishes valid concepts and examples relating to transportation. They can be used in a variety of categories depending upon the school locale, grade level, interests and needs of the pupils.

IMPLICATIONS

The main objective of the social studies is the development of democratic citizens. A citizen needs to be informed so that he may understand the world in which he lives. Bodies of factual information serve a useful purpose in helping students understand and appreciate the significance of past and current events. Since facts sometimes lose their significance and even their validity in isolation and with the passage of time, the goal of the social studies program is to help students integrate factual information into a series of broad understandings and enduring generalizations which will be useful in solving life's problems.

Curriculum planners introduce concepts in the sequence where they can best be understood and use available research data related to content, child growth and development. New concepts will be built on the concepts previously developed and learnings will be reinforced periodically through varied experiences.

Goals, content and desired concepts are inter-related, and outcomes are expressed not only by acquisition of information and skills but by attitudes and understandings and behavior. The curriculum needs to be evaluated often in light of these terms.

The social studies provide a unique laboratory for learning experiences. Pupils will develop new understandings, attitudes and skills in proportion to the extent that they have been engaged in active learning experiences.

Many curriculum guides have identified major generalizations which provide guide lines for the social studies programs. It is impossible to include in the guides all the concepts which individual teachers may desire to develop.

This study was made to provide a source from which teachers and other school personnel could draw in preparing units of study or curriculum guides. No attempt was made to allocate grade level to the concepts in this study.

Many school curriculum guides list major understandings similar to the following as goals for the social

studies programs.

1. Man changes his living to existing conditions.
2. Peoples of the world are interdependent.
3. Environment affects man's way of living, and man, in turn, modifies his environment.
4. Man lives in a continually changing world.
5. New inventions lead to changes in ways of living.
6. People are very much alike, but they differ in their ways of living because of geographical and historical factors.

These understandings are not spelled out to the children at the beginning of a unit of study but are the "anticipated outcomes."

The study of transportation is common to all elementary school social studies programs because it is an aspect of human living which is basic to any culture.

Children may study transportation as it functions in the local community, at the national level, or transportation systems of the world, past and present.

A fifth grade class could use selected concepts from this study to add interest and information to the story of how the United States became a country. A sixth grade pupil studying about expanding horizons into the world community could use concepts that relate to the likenesses and differences in transportation in countries of the world. Through active participation in solving problems which had been agreed upon by the class, his attitudes

toward other peoples of the world is altered. He learns to work with other class members in finding and presenting answers to the suggested problems. He is developing skills in reading, in the use of globes and maps, in preparing written and oral reports, and in the use of encyclopedias and other reference materials. He increases his skill and appreciation in other fields as art, creative dramatics, music, poetry and handwork as these are used in the development and presentation of a social studies unit.

Another approach using the concepts in this study would be to use the concepts related to the economics of transportation. The teacher could select the concepts and examples which would provide a framework for this unit. Examples of these are: Concept number 10, "Capital is required to buy or build any type of transportation excepting the human carrier."

The examples include the facts that: "(a) Animals must be bought or raised. (b) Capital is necessary to build vehicles operated by animals or man, such as sleds, bicycles and wagons." Another concept relating to economics is number 94, "Transportation charges are part of the cost of production, so must be included in the price paid for the goods by the consumer." The examples add further information reinforcing the concept.

Transportation has other interesting aspects, such as the historical. Many of the concepts and examples

would be valuable to those utilizing this approach. A large number of concepts and examples included are related to each division of transportation as land, air, water, rail and pipelines.

No attempt was made to categorize the concepts since the number of possible categories is infinite. In the spiral curriculum the basic generalizations are reinforced as transportation is studied on a continuously and progressively more mature level. Numerous concepts with examples are provided for learning about transportation at varying levels of maturity.

This study was designed to be a contribution to school personnel seeking to present social studies as a dynamic area of the curriculum in which pupils use inductive processes for developing major generalizations as characteristics of a laboratory subject.

BIBLIOGRAPHY

BIBLIOGRAPHY

A. PRIMARY SOURCES

1. Bruner, Jerome S. The Process of Education. New York: Vintage Books, 1960.
2. Burton, William H. The Guidance of Learning Activities. New York: Appleton-Century-Crofts, Inc., Third Edition, 1962.
3. Carner, Richard L. Concepts, The Alpha and Omega of Reading. Reading Bulletin Number 107. Boston, Mass.: Allyn and Bacon, Inc., 1961.
4. Furman, Dorothy. "Content, Trends and Topics," Social Studies in Elementary Schools, Thirty-Second Yearbook, Menasha, Wisconsin: George Banta Company, 1962.
5. Gibson, John S. "New Frontiers in the Social Studies," The Lincoln Filene Center, Medford, Mass.: Tufts University, 1965.
6. Greater Cleveland Social Science Program. Living In Anglo America. Grade Three, Volume I (Teacher's Edition), Fourth Edition, 1965-66.
7. Hanna, Lavone, and Neva Hagaman. "Action Principles from Studies of Child Development," Social Studies in Elementary Schools, Thirty-Second Yearbook of the National Council for the Social Studies, Menasha, Wisconsin: George Banta Company, 1962.
8. Hanna, Lavone A., Gladys L. Potter, and Neva Hagaman. Unit Teaching in the Elementary School. New York: Rinehart and Company, 1955.
9. Hanna, Paul R., and John R. Lee. "Generalizations from the Social Sciences," Social Studies Yearbook, Menasha, Wisconsin: George Banta Company, 1962.
10. Jarolimek, John. Social Studies in Elementary Education. New York: The MacMillan Company, 1965.
11. Montebello Unified School District, "How People Travel and Communicate Within a Community," Social Studies Guide for Grade Two, Curriculum Bulletin E.S.S. 100, Montebello, California: Montebello Unified School District, 1965.

12. Oregon State Department of Education, "Guide to Elementary Education in Oregon," Salem, Oregon: Department of Education, 1966.
13. Preston, Ralph C. Teaching Social Studies in the Elementary School (Revised Edition). New York: Holt, Rinehart and Winston, 1962.
14. Ridgewood Public Schools. Report of Preliminary Committee for the Social Studies. Ridgewood, New Jersey: Ridgewood Public Schools, Summer, 1964.
15. Stendler, Celia B. Teaching in the Elementary School. New York: Harcourt, Brace and Company, 1956.
16. Taba, Hilda. Curriculum Development. New York: Harcourt, Brace and World, Inc., 1962.
17. Tieg, Ernest W., and Fay Adams. Teaching the Social Studies. New York: Ginn and Company, 1959.
18. Wann, Kenneth D., Miriam Selchen Dorn, and Elizabeth Ann Liddle. Fostering Intellectual Development in Young Children. New York: Bureau of Publications, Teacher's College, Columbia University, 1962.

B. SECONDARY SOURCES

1. Childhood Education. (Social Studies issue), Washington, D.C.: Association for Childhood Education, International, November, 1966.
2. Department of Elementary, Kindergarten, Nursery Education. Guiding Children Through the Social Studies. Washington, D.C.: National Education Association, 1964.
3. Department of Elementary School Principals. Focus on the Social Studies (1965 Report). Washington, D.C.: National Education Association.
4. Michaelis, John U. Social Studies for Children in a Democracy. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1956.
5. Miel, Alice, and Peggy Bragon. More Than Social Studies. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1957.
6. Ragan, William B., and John D. McAulay. Social Studies for Today's Children. New York: Appleton-Century-Crofts, 1964.