ANTICIPATORY EXPERIENCES LEADING TO COMPETENCE WITH FORMAL MAPS

by

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CHAPTER I

INTRODUCTION

Importance of Problem

That an interest in, and a study of, geography has been steadily on the increase during the past decade is nationally recognized. Much has been written about this revival of interest. People who do not like geography do not know the subject, and often trace their dislike and geographic illiteracy to earlier contacts with the subject and their inability to read and understand maps. The belief that much of this could be prevented by proper preparatory experiences in map readiness in the first three grades was the primary motivating factor in the beginning of this study. Undercurrent in most of the literature dealing with map study was the feeling that teachers frequently expect a child to read meaning into the complex symbolism on the face of a globe or map without preliminary training.

Such titles as "Maps for Victory," "Maps--Global War Teaches Global Cartography," "The Use of Maps in Propaganda," "Maps are Weapons" and "America Grows Map-Minded,"[1] indicate to some degree that people have become "map conscious."

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1. Walter W. Ristow, "Maps: How to Make Them and Read Them; a Bibliography of General and Specialized Works on Cartography," Journal of Geography, 42:260-61, October, 1943.

As tragic as it may seem, it took a second world war to awaken the American public from its complacency regarding its position in the world. Geographical illiteracy, more than anything else, was responsible for the deep-seated isolationist smugness.[2] Radio quiz programs capitalized on this shocking national condition. Evidences of it were found too in parlor games, in business, in schools, and even in congress.[3] Librarians in large cities wrote of numerous and humorous instances when their assistance was asked to clarify geographic locations.

Dr. George T. Renner points out that among seventeen other lessons,

> the war has taught us that few people can read maps, fewer yet can interpret them, and only a very few can make them. And yet there are fewer things more necessary than map skills.[4]

"It is a saying of the colonels and the generals that every battle begins on a map, and that many are lost or won there."[5] In the 1944 invasion alone the armed forces used 70,000,000 maps, over 3,100 different kinds. These weighed 3,480 tons or as much as eighty-three Pullman cars.[6] The

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2. Eugene Lyons, "The New Geography," American Mercury, 54:461, April, 1942.

3. Dan Stiles, "Why Not Teach Geography?" Harper's Magazine, 186:626-27, May, 1943.

4. George T. Renner, "What the War Has Taught Us About Geography," Journal of Geography, 43:325, December, 1944.

5. C. Lester Walker, "How the War Maps are Made," Harper's Magazine, 189:254, August, 1944.

6. Ibid., p. 262.

government spent millions educating the fighting forces to use these maps--a job the schools had already been paid to do.

> If we are to have a world war every twenty odd years and if they are to be fought in out-of-the-way regions, then we need a ready knowledge of these "outlandish" places.[7]

Dr. Penner offered no answer at all at the elementary level, but, like many geographers, recommended strongly new courses on the secondary level to fill the need of global geography to maintain peace. Repeatedly, writers, deploring the geography illiteracy of Americans, have quoted the United States Commissioner of Education, Dr. John W. Studebaker, when he said, "Apart from the rather backward nations, we are more illiterate geographically than any nation I know. The reason is that we have never really taught geography." If brightly colored maps greet the children of Germany in their kindergarten classes and follow them through every stage of their education, this idea might well be transferred to the schools of the United States.

Statement of Problem

Up until the last decade, insufficient literature on the subject was a contributing factor to map and geography illiteracy. This is still true on the primary level and yet

> it is the responsibility of the lower grades to see to it that children's original exposure to

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7. Ernest C. Witham, "Place Geography is Again Important," American School Board Journal, 104:29, February, 1942.

> maps is so real and clearly understood that work with them afterwards will be a pleasure.[8]

It seems to be universally recognized by teachers and writers in current literature, courses of study, and textbooks that no formal training in geography or map study is presented before the fourth grade. However, the need of stages, steps, gradations, or sequences in map study is also recognized. Promoting readiness is the first of these stages, and may begin in the primary grades.[9] The object of this thesis is to determine what are the anticipatory experiences that may be given to children in grades one, two, and three that will lead to competence with formal maps.

The adequate treatment of this topic requires satisfactory answers to the following questions:

1. What is expected by way of competence at the end of the third grade?

2. What competences are found in the first, second, and third graders?

3. What experiences, devices, and insights are helpful in securing the desired competences?

4. What recommendations can be made in the light of the study?

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8. Elizabeth Dudley, "An Approach to Map Study," Journal of Geography, 36:354, December, 1937.

9. Gertrude Whipple and Preston James, "Instructing Pupils in Map Reading," Social Education, 11:205, May, 1947.

Delimitation of the Problem

Maps have been called "the literature of space,"[10] "the true shorthand of geography,"[11] "the most important of all the major visual instruments in education,"[12] and many other titles and definitions have been given them. For this study, the following simple definition is sufficient: "A map is a ground plan of certain features and conditions observable in real landscapes."[13] No attempt has been made to define or describe the technical side of cartography. Only as they pertain to the work in the first three grades are any of the hundreds of kinds or types of maps and globes mentioned.

This study is limited then

1. To the study of maps as they pertain to children in grades one, two, and three.

2. To competences expected of these children by teachers; writers of courses of study available in the Libraries and Curriculum Laboratories at Woman's College, Greensboro, and the University of North Carolina, Chapel Hill; by specialists with leading map companies responsible for

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10. Mackenzie Brown, "Maps, the Literature of Space," Library Journal, 68:323, April 15, 1943.

11. Carl H. Mapes, "Creative Map Making in the Teaching of Historico-Geographical Units," Journal of Geography, 39:160, April, 1940.

12. George T. Renner, "The Map as an Educational Instrument," Social Education, 4:477, November, 1940.

13. Muriel Crosby, "Learning to Live in the Wide House of the World," Childhood Education, 22:381, April, 1946.

furnishing the state schools with maps and globes; and by contributors to professional literature.

3. To competences found in the children of the first, second, and third grades of the Appalachian Demonstration School for the year 1947-1948, and the findings of corroborators who have made similar investigations in the field of specific competences.

Method

1. A determination of what is expected by way of competence at the end of the third grade was made through:

a. An analysis of courses of study and social studies bulletins available in the Libraries and Curriculum Laboratories at Woman's College, Greensboro, and the University of North Carolina, Chapel Hill.

b. Suggestions offered by the five map companies from whom the schools are advised to purchase maps and globes.

c. Survey of pertinent, periodical literature since 1935.

d. Consensus of experts and teachers in the field.

2. Determination of what competences are found in the first, second, and third grade children was made through:

a. Informal personal interviews with 228 first, second, and third grade children in the Appalachian Demonstration School for the year 1947-1948.

b. Opinions of the teachers of these children and other teachers in the field of what they believe children know.

c. Findings of investigators of specific competences.

3. A determination of experiences, devices, and insights helpful in securing the desired competences was made through:

a. A survey of periodical literature since 1935.

b. An analysis of methods presented in available manuals, courses of study, and social studies bulletins.

c. Devices used by successful teachers.

d. Consensus of the experts in periodical literature surveyed.

Survey of the Literature

In the search for pertinent material and related studies the following reference works were used:

Palfrey, Thomas R., and Coleman, Henry E. Guide to Bibliographies of Thesis--United States and Canada. Second edition. Chicago: American Library Association, 1940.

United States Library of Congress. Catalogue Division. List of American Doctoral Dissertations Printed in 1912. Washington: Government Printing Office, 1913-1938.

Doctoral Dissertations Accepted by American Universities. 1933-34. Compiled for the National Research Council and the American Council of Learned Societies by the Association of Research Libraries, New York, Wilson, 1934-1947.

Monroe, Walter Scott. Ten Years of Educational Research, Bulletin No. 42, August, 1928. Urbana, Illinois. University of Illinois, 1928.

United States. Office of Education Library. Bibliography of Research Studies in Education, 1920-27. Washington. Government Printing Office. 1929-40.

Good, Carter Victor. Doctors' Theses Under Way in Education. Appears annually in the January issue of the Journal of Educational Research. January, 1931-January, 1946.

Gray, Ruth A. Doctors' Theses in Education, a list of 797 Theses Deposited with the Office of Education and Available for Loan. Washington, Government Printing Office. 1935.

Columbia University, Teachers College. Register of Doctoral Dissertations Accepted in Partial Fulfillment of the Requirements for Degree of Doctor of Philosophy, Vol. I, 1899-1936, compiled and edited by Anvor Barstad, and others. Teachers College Bulletin, 28th Series, No. 4, February, 1937. New York, Teachers College, 1937.

New York University, Washington Square Library. List of Doctors' and Masters' Theses in Education. New York University, 1890-June, 1936. New York, New York University, School of Education, 1937.

Northwestern University. List of Doctoral Dissertations. 1896-1934. Evanston, Illinois, The University, 1935.

Education Index: A Cumulative Author and Subject Index to a Selected List of Educational Periodicals, Books and Pamphlets. New York, H. W. Wilson Company, 1929-May, 1948.

Related Studies

In making the above survey of literature one study was found which adds to the importance of this study:

Sister M. Benigna Schreck, The Relative Merits of Different Kinds of Maps in the Teaching of Geography. Unpublished Master's Thesis, Catholic University, 1940. 42 pages.

This study

> describes an experiment conducted with 400 children ranging in age from 10.5 to 12.5 years with I.Q's. of 95 and more to determine the effectiveness of different types of maps as compared with a travel story containing the same information, on the teaching of geography. Shows that map study produces better learning than mere reading information.[14]

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14. United States, Office of Education, Library, Bibliography of Research Studies in Education, 1939-40. Washington, Government Printing Office, p. 104.

CHAPTER II

COMPETENCES EXPECTED BY THE END OF THE THIRD GRADE

> Children learn geography in the elementary school through the books they read, the places they go, the weather they feel, the seasons they learn to understand, and the workers who become their friends. Such study begins in kindergarten and nursery.[1]

Renner believes that geography is a reasoned subject and cannot be taught on the primary level. For tomorrow's citizens he recommends a geo-centric curriculum.

> In the new curriculum, geography will disappear from the primary school where it has never belonged. Its study will begin at the very earliest, at perhaps the fourth grade level, in the form of community geography.[2]

Tradition seems to have set the fourth grade as the beginning of all formal geography teaching in this country. Contrary to Renner's theory it is the beginning of a geographic framework of the world; regional and not community geography is taught here. If, on this level, children are getting no more than a "fairy book geography," then perhaps Renner is justified in his belief.

Numerous writers in the field of elementary geography, however, believe that certain skills and abilities can be

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1. Lucile Allard, "The Use of Visual Aids in Teaching Elementary Geography," Education, 64:429, March, 1944.

2. George T. Renner and Alfred H. Meyer, "Geography For Tomorrow's Citizens," Educational Method, 22:205, February, 1943.

and should be developed on the primary level. Certainly definite attitudes are established very early in the school program.

> The conceptions developed during the impressionable years of childhood are often times either a help or a hindrance in later academic study. If the initial image is fairly accurate it is a definite help, but if this first impression is not in keeping with realities the problem of altering the mental picture must be solved. This is possibly best realized in the field of geography in which a careful and accurate introduction may lead to an enjoyable and successful study.[3]

Since "maps and map reading are almost synonomus (sic) with the term geography,"[4] emphasis on geography readiness, of necessity, includes emphasis on many phases of map-reading readiness.

> Some years ago it was estimated that 8.8 per cent of the reading material used in the first grade was geographical in character; that, in the second grade, 34.2 per cent of this material was geographical; and that, in the third grade, 56.0 per cent of the material was geographical in character.[5]

In a survey of twenty third-grade readers Meighen and Barth found

> a great amount of geographic material is introduced in third-grade readers; many of the stories in third-grade readers would not be

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3. A. O. Tom, "Relief Modeling in Elementary Geography," Journal of Geography, 39:281, October, 1940.

4. Kathryn Schnorrenberg, "Visual Materials Vitalize Geography," Education, 64:425, March, 1944.

5. O. W. Stephenson, "Still More Geography in the Schools?" Journal of Geography, 44:5, January, 1945.

> especially meaningful to children unless they knew something about the location and the environmental features of the regions introduced; many geographic terms are introduced which need the use of maps and pictures to make them clear to children; ...there are many third-grade class rooms in which there is limited use or no use of maps and globes.[6]

In closing the report of the above survey the writers made

> ...a plea for the use of maps and pictures in connection with reading at as early a level as the child's interests demand, not only because of the variety of contacts which he makes with world geography in his reading, but also because of the broad social world which he experiences daily through such social forces as the radio, the automobile, the newspaper and the movies.[7]

Maps are the sign language of geography. The understanding of these signs is universal; that is, a person who reads and comprehends an English map can likewise understand a Spanish map. Because maps are composed of signs and symbols, children must be prepared to "learn to read" them before they can "read to learn" from them. Just as reading readiness is of major concern to the teacher in the first grade before beginning the fundamentals of reading, so map readiness must be of concern to the teacher of the third grade, if the children are to be ready for map reading in the fourth grade.

> Few schools provide pre-geography in the curriculum, and few authors have published geography-readiness materials. Children are plunged into

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6. Mary Meighen and Ethel Barth, "Geographic Material in Third-Grade Readers," Elementary English Review, 15:301, December, 1938.

7. Ibid.

> the subject before their readiness for it has even been determined.[8]

In a study by Gertrude Whipple a few years ago to determine how the course of study could improve the use of geographic material, it was found that

> the 80.9 per cent of the courses which considered maps were concerned with many types of maps, such as political, population, occupational, vegetation, relief, rainfall, pictorial, and highway maps in books, as well as wall maps, blackboard maps, plastic maps, and individual outline maps. Most of the courses merely listed the maps to be used, but a few discussed the use of the maps, the teaching of map symbols, or the making of maps in the classroom, and an occasional course named commercial firms from which maps could be purchased. Two courses of study also included material for testing the pupil's ability to read maps. In view of the importance of teaching concepts of location, it would seem that every course of study involving geography should give teachers definite help in training the pupil to use the maps which he meets in his reading.[9]

The above study included 110 courses of study from twenty-two state departments of education and twenty-five cities with populations of 165,000 or more. All the bulletins analyzed were concerned with grades three to eight. This report is significant for this study for two reasons: If 110 courses of study dealing with grades in which the greatest emphasis is put on geography and map reading give such little help to the classroom teacher, it is unlikely that one would find any practical suggestions for pre-map training in the

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8. Gertrude Whipple, "Human Geography--From Slogan to Actuality," Elementary School Journal, 41:343, January, 1941.

9. Gertrude Whipple, "How Can the Course of Study Improve the Use of Geographic Material?" Elementary School Journal, 43:154-55, November, 1942.

first and second grade curriculums in the same school systems. Second, a similar condition was found in a survey of a large number of courses of study by the writer.

Of the many courses of study surveyed, only six were found that listed specific skills or abilities to be developed in each of the primary grades and suggested methods of development. These curriculum makers differ in the placement of the abilities. Most of them begin some of the work in the first grade and advise the repetition or drill on the skills in the second and third grades. Others mention skills to be developed in the first grade and then make no further suggestions about them until the child begins his formal work with maps. Following is a list of the specific skills suggested and the number of courses of study providing for development on each grade level:

SKILL OR ABILITY	GRADE LEVEL		
	I	II	III
To tell directions	2	1	4
Make floor map	3	2	1
Make and use simple maps	3	3	4
Make and interpret symbols	1	1	5
Identify physical features of land and water in real landscapes			3
To locate	1	1	2
Use globe		1	2
Use maps--outline, physical, political, relief, product, rainfall, pictorial			1
To use simple scale of measure			2

SKILL OR ABILITY (Continued)	GRADE LEVEL I	II	III
Know shape of earth	1		
Recognize land and water forms by color	1		1
Recognize continents and oceans			1
Select type of map needed			1
Use pictures to interpret landscape . .			1
To tell distance			1

From these surveys of the courses of study one must agree

> it is not yet the fashion to incorporate very definite provision for skills in curriculum proposals, as evidenced, for instance, in the recent publication of the National Council for the Social Studies, The Future of the Social Studies...which largely takes it for granted that suitable skill training will somehow accompany the courses outlined.[10]

Only one of the sixteen contributors to The Future of the Social Studies mentioned above hints of specific skills in the first three grades.[11]

Although advertisements would indicate that map companies are putting out many helpful maps and globes for the use of the lower grades, actually they have little to offer in the way of suggested uses of their wares in these early grades. Denoyer-Geppert suggests the making of a map

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10. George W. Hodgkins, "A Skill-Training Program for the Social Studies," Social Education, 4:568, December, 1940.

11. Roy W. Hatch, "A Program in the Social Studies," The Future of the Social Studies, Proposals for an Experimental Social Studies Curriculum; edited by James A. Michener. Cambridge, Massachusetts: The National Council for the Social Studies, 1939. pp. 23-41.

of the classroom, school and yard, and community, and the use of the globe in the first two grades to illustrate the shape of the earth and to point out places in which the children have specific interest. In the third grade distinction should be made between land and water and the term sea-coast or coast-line defined. Finding the names of the largest land and water areas and expanding the knowledge of the globe within the pupils' capacity were also listed on the suggestion sheets sent from the Denoyer-Geppert Company.

Gertrude Whipple, Supervisor of Reading in the Public Schools, Detroit, Michigan, and Associate Professor of Education at Wayne University, has done more than any other one writer to emphasize the importance of geography readiness before children attempt formal study of the subject. Part of another study made by Miss Whipple is mentioned here to corroborate the findings by the writer. In 1941 Miss Whipple sent questionnaires, listing thirty-two items of readiness prepared on the basis of her judgment after consultation with a few specialists in geography and elementary education, to 320 representative school officials in both rural and urban areas in every state in the union. Her purpose was "to show that geography readiness can be analyzed and that the study of geography can be planned for intelligently."[12] All the co-operators in the study were identified with instruction in the third and fourth grades either as supervisors or teachers. They were asked to check those items they thought

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12. Gertrude Whipple, "Elements in Geography Readiness," Elementary School Journal 42:256, December, 1941.

necessary for geography readiness and were given the opportunity to add other items. Nearly three times as many items as were originally listed were added. In a number of these, teachers seemed not to know where to draw the line between readiness to pursue the subject and readiness to undertake it. Conclusions drawn from the 205 responses listed seven elements widely recognized by the co-operators. They are listed here because they are also very definitely elements in map readiness.

> (1) an adequate experiential background, (2) an interest in the more concrete phases of geography, (3) good habits of observation, (4) beginnings of reasoning ability, (5) a meaning vocabulary which includes the most common geographical terms, (6) ability in reading within one grade of the child's position in school, and (7) at least potential ability to orient one's self spatially.[13]

She believes that "in a sound curriculum, effort must be made to build these items of readiness before children are expected to master geography."[14]

A survey of the literature since 1935 reveals a consciousness of pre-map reading skills by many writers. It would be difficult to say that a certain number of writers believe that children completing the third year of school are expected to have a specific number of pre-map skills. Some writers merely report what has been done in the third grade and point out that, as a result of stated

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13. Ibid., p. 267.

14. Ibid.

activities. certain skills or facts were developed. Others, writing more from theory, indicate experiences necessary to develop competence in particular areas, but do not set the end of the third grade as the deadline. Too, there is not always complete agreement among the professional writers. It becomes necessary, therefore, to list the findings in pertinent literature as competences and experiences desired by the end of the primary grades or before the child is ready for formal map training. The following are listed with the number of writers, who, by direct statement or inference, believe these necessary:

Knowledge of the cardinal directions	13
Identification of actual landscape features	13
Introduction of simple globe	7
Making plan or simple map	7
Familiarity with geographic terms (ocean, plain, etc.)	4
Seeing views or pictures of typical regions throughout world	4
Understanding of simple scale of measure	4
Understanding of simple symbols	3
An interest in the subject	3
Ability to read simple diagrammatic maps	2
Some conception of distance	3
Appreciation of the size of the world	2
Use of picture map	1
Understanding that earth is round	1
Recognize outline map of own state	1
Recognize outline map of the United States	1

Very little definite help came from first, second, and third grade teachers in establishing desired goals. Most of their teaching, according to informal personal interviews, was purely incidental. One indicated attempts to teach direction on the map, for instance, but admitted the children had no idea of orientation in space. Another taught direction in space, but did not tie it up with the globe or map. Others developed definite understanding of directions with sun shadows, winds, etc. Another said, "No, am I supposed to teach that?"

The majority of teachers had no globe as a part of the classroom equipment, but many teachers said a globe was available and could be borrowed for short periods of time. Most teachers would like to have a globe as a part of the permanent equipment in each of the first three grades.

In the light of the foregoing information, one may conclude that before children are ready to begin formal map study--certainly before they reach any degree of proficiency in it--they must have had the following meaningful experiences: indicated the cardinal directions in space; identified the physical features of land and water in actual landscapes; handled a simple globe, noting its sphericity and distinguishing the land and water symbols; made plans or simple maps of known areas; used maps for specific reasons; made and interpreted simple symbols; understood by visual imagery simple geographic terms such as ocean, plain, valley, hill, etc.; observed views or pictures of typical world regions to inter-

pret various types of landscape; participated in the location of places of interest; understood simple scale of measure; have some conception of distance and an appreciation of the size of the world; read simple diagrammatic maps; used, to limited extent, various maps--outline, physical, political, relief, product, rainfall, pictorial; recognized an outline map of the native state and of the United States. From these experiences, they must have developed related competences.

When and how to develop these desired competences is the purpose of this study and will be discussed in full in Chapter IV.

CHAPTER III

COMPETENCES FOUND IN THE FIRST, SECOND AND THIRD GRADES

To determine exactly how much children understood about what maps and globes are and how they are used, and to test their orientation spatially, 228 children in the first, second and third grades of the Appalachian Demonstration School, Boone, North Carolina, were interviewed personally by the investigator during the spring of 1948. There were eighty-one first grade children, seventy-two second graders, and seventy-five third graders.

The children were taken into the room in small groups. While one child was being interviewed the others played at the opposite end of the room out of hearing of the questions and answers. All the children were willing subjects and seemed happy and at ease during the entire interview. A number wanted to come in for a second time. When the child showed any knowledge at all, his exact words were written on his report. All interviews were informal and unhurried.

Most of the questions were based on the following objects: a small, five or six-inch, colored, political globe; a large, twenty-inch, project-problem or simplified globe; political map of North Carolina; semi-elliptical, physical-political map of the world; physical-political map of North America; an Armour's Food Source Map and a North Carolina road map. All the maps were wall maps and the name of each was covered.

The same question was asked of each object: "Do you know what this is?" If the child answered "map" for the maps, then he was asked, "What kind of map?" If he named the kind, he was asked, "How did you know it was that kind?" or "What makes you think it's that?" or a similarly worded question. After the road map question, he was asked, "Have you ever seen anything like this?" If "road map" was his answer to the first question, then he was asked, "What kind of road map?" and then "Do you know how a road map is used?"

Following the answers to the questions about the globes and maps, the child was asked, "Do you know what a map is?" He was encouraged to tell all he knew about the map.

The final questions concerned the cardinal directions. They were: "Do you know which way north is? South? East? West? Do you know which way the sun comes up? Do you know which way it goes down?"

Two observations of significance were noticed in tabulating the answers. First, with but few exceptions, the answers indicated definite growth in map knowledge from grade to grade. Second, the groups of children with the broadest experiential background were superior. This was determined by a knowledge of the placement in the two sections of each grade. There were exceptions, of course, but for the most part, the sectioning of the children was determined by the location of the child's home and the time when he started to school.

Those children who lived in town and started to school in summer school instead of beginning in September were placed in one section. These were the children of college and school faculty members, of the doctors, dentists, merchants, and other business men in town. In the other section were the children who came in from the surrounding mountain communities on the school busses. Some of them had the advantages of the town children, but most of them came from large, and often under-privileged, families. The two sections in each grade were about evenly divided in number.

Global Concepts

The summary of the answers to the question concerning the small political globe follows:

GRADES	I	II	III	TOTAL
Had no idea at all	49	35	12	96
World	8	10	16	34
Globe	3	3	6	12
Map	12	19	35	66
Ball	3			3
Miscellaneous	6	5	6	17

Only one of the miscellaneous answers could not be accounted for. One child called the small globe a "calendar." No reason could be given for such an answer. Two children called it a "bank" from the association with the world banks found in many homes. The other answers indicated to a limited degree the child had some understanding of the use of the globe, but did not know what it was.

The children had even fewer ideas about the large, project-problem globe. This globe had been used once in one of the first grades, but the short use of it had not been of much real help in that class according to the answers. The answers are given as follows:

GRADES	I	II	III	TOTAL
Had no idea	54	48	32	134
World	8	8	9	25
Globe	4	4	6	13
Map	7	10	23	40
Ball	3			3
Miscellaneous	5	2	6	13

The miscellaneous answers were more varied for the large globe. Many of these answers indicated learning that was not altogether incorrect, but was incomplete. For example, one child called it "oceans"; another "where all the water is"; another "map of water" because "nearly all of it's blue." Two other children called it "an Eskimo map" and "an Eskimo globe; it tells where the Eskimos live." The most specific answer was given by the son of an education professor: "It is a globe that shows where the ocean and land is." Of all the miscellaneous answers the child who said it was the "sky" and the boy who called this one a "calendar too" seemed to be the most confused.

Map Understandings

There was more evidence of understanding about the world map than about either of the globes. This was interest-

ing in view of the belief of the authorities that the globe should be presented before the child sees the map. Answers to this question are:

GRADES	I	II	III	TOTAL
Had no idea	50	39	25	114
World map	3	6	7	16
World	3	7	17	27
Map	16	5	5	26
Half the world, parts of the world, or one side of the world			5	5
Miscellaneous	9	15	16	40

Many of the children who called this map the "world" said they knew it was because it was "so big and round." A large number of the children were definitely confused in the use of geographic terms. This indicated to the investigator that they had met these terms but did not understand their significance. The following answers illustrate this point: "South America and North America," "Atlantic Ocean, Africa and different states," "map of South America," "Africa," and "I think it's north and all them states." Several children called it "north." This was before the term was mentioned in the interview. A few children connected it with the "oceans" or "seas" because of the blue on it. The same child labeled this "a calendar" too, as he did all the globes and maps except the Armour's Food Source Map, which he called "land." Two children called it a "mountain," and one child without hesitancy said "an Easter egg." Only three children seemed to see the connection between the globe and world map. One

of these said it was "like the globe--not like it but the same thing."

Of all the maps the least was known about North America. Answers about this map were:

GRADES	I	II	III	TOTAL
Had no idea	53	55	32	140
North America			11	11
Map	18	7	4	29
United States map			6	6
United States		2	9	11
Miscellaneous	10	8	13	31

A number said they thought it was the United States because it had the Gulf of Mexico on it. A few recognized it because of the position of Florida. There was the same evidence of misunderstanding of geographic terms as illustrated by the children who called the map "east" or "south." There were also several meaningless titles given such as "forest," "parachute," and "clouds."

The Armour Food Source Map, a very colorful picture map of the United States showing the areas producing the major farm products, caused the greatest variety of answers. For the most part very logical reasons were given for the answers. The answers follow:

GRADES	I	II	III	TOTAL
Had no idea	53	30	26	109
Picture map of food			1	1
Farm map	1	6		7

GRADES	I	II	III	TOTAL
Picture map	1			1
Map	12	9	10	31
Farm	1	9		10
Animals map		4	8	12
Food Map		1	5	6
United States map			3	3
United States			6	6
Miscellaneous	13	13	16	42

The miscellaneous answers again revealed that the children had met certain geographic terms, but the terms had not been clearly defined for them. Answers similar to these were prevalent: "map of west, because they have cattle," "somewhere down south; all making something and it's pretty," "map of Florida, because oranges and lemons grow there." Except for the little girl who called this whole map a "cow, because it's shaped like one," the answers to this question showed evidence of definite reasoning. Several children called it a "Chinese map" and an "old-timey map." One first grader, when asked why he called it that, replied, "Because it has funny wagons, and the people work different from the way they do now, and the cows are just anywhere."

It was expected that the common road map would have been familiar to a larger number of children than any of the others. Many said they had never seen one before. Those who recognized it readily were the children whose fathers worked at service stations, drove produce trucks, or had used a road

map when planning vacation trips. The results are indicated as follows:

GRADES	I	II	III	TOTAL
Had no idea	50	42	31	123
Road map of North Carolina			1	1
Road map	5	3	7	15
North Carolina		3	10	13
Tells you where to go	2	1		3
A map	19	19	10	48
Miscellaneous	5	4	16	25

Several children identified it as North Carolina because of certain cities which they pointed out and named. Some told what it was and how one had been used by their family on long trips "to Maryland," "to Florida" or "when we went after a load of peaches." One child, a first-grade boy, mentioned the use of the numbers on the map as the guiding factor.

The North Carolina political map with its bright array of colors was indeed fascinating to the children. Comparatively few recognized it. Again cities were named as a means of identification and in a few instances counties were pointed to and named. A few recognized it by shape. One third-grade teacher had tried to emphasize this means of recognition by cutting out the state from a road map and using it alone on the bulletin board. The other third-grade teacher had used it too but did not cut it out. Exactly how much teaching had been done with it is not known. The

last group was three times better, but this same group was superior in all the answers given. The answers are listed here:

GRADES	I	II	III	TOTAL
Had no idea	45	39	20	104
North Carolina Map		3	6	9
North Carolina		4	25	29
Map	27	18	20	65
Miscellaneous	9	8	4	21

Answers to the question, "What is a map?" showed that more than half of the children had some idea of what it was and most of them could give one or more uses. Location of places, usually particular places, and preparing for a trip were the two best known uses. The fact that a map "tells" or "shows" something seemed to be quite well-known. The twins who said "It tells you where your daddy is in the army or navy" definitely had an experience with a map. Geographic misunderstandings were still noticed in answers like this: "Shows all the world, cities, North Carolina and Boone, South Carolina, east and all of them." These answers are tabulated as follows:

GRADES	I	II	III	TOTAL
Had no idea	47	31	17	95
Locating places	7	11	21	39
Preparing for a trip	16	12	27	55
Finding way after getting lost	2	4	2	8
Shows where you live	2		1	3
Shows parts of world	1	1	3	5
The world	1	7	5	13
Miscellaneous	7	6	5	18

If a child named two uses, his answer was tabulated twice.

Spatial Orientation

Less than one-eighth of the children were found to be oriented spatially, as the following facts indicate:

GRADES	I	II	III	TOTAL
NORTH				
Direction not known	68	45	19	132
Mistaken response or incorrect guess	10	19	36	65
Correct	3	8	20	31
SOUTH				
Direction not known	70	49	16	135
Mistaken response or incorrect guess	9	18	40	67
Correct	2	5	19	26
EAST				
Direction not known	67	50	20	137
Mistaken response or incorrect guess	11	19	40	70
Correct	3	3	15	21
WEST				
Direction not known	68	48	22	138
Mistaken response or incorrect guess	12	19	40	71
Correct	1	5	13	19
Directions not correct but recognized as opposites		3	14	17
SUNRISE				
Direction not known	56	35	9	100
Mistaken response or incorrect guess	15	22	32	69
Correct by pointing or saying "east"	10	15	34	59

GRADES	I	II	III	TOTAL
SUNSET				
Direction not known	54	39	8	101
Mistaken response or incorrect guess	17	21	33	71
Correct by pointing or saying "west"	10	12	34	56

Five children who knew the cardinal directions did not know which way the sun rose or set. On the other hand, thirty-six children knew which way the sun rose and set but did not know the cardinal directions. Several children confused the cardinal directions with cities and countries. The use of the terms with North Wilkesboro and West Jefferson might explain their association with the cities. Unless they think North Carolina is a country, this confusion cannot be accounted for. A few children associated the directions with the wind. One child said his daddy taught him that "the north wind comes up the hill and the west wind comes down the hill."

"Up from the sky," "out of the woods," "over the mountains," and "behind the clouds" were common ways of describing the sunrise and sunset. When questioned about this, one first-grade girl said, "I know one place it comes up." When asked where, she replied, "Up at Mr. and Mrs. Elrod's." They lived above her, she said. The same child said of the sun going down, "It lands in the woods, but I don't see it go down."

The only suggestion made by the North Carolina State Department of Public Instruction for the teaching of these facts is in the bulletin Science for the Elementary School. The path of the sun is taught in the first grade by teachers

following this bulletin, and reference is made to the North Star and its help in telling directions and to the Magnetic North Pole and the compass in the third grade.[1]

Two similar tests have been made determining primary children's orientation. In a study of 138 first grade pupils and 155 second grade pupils in five elementary schools in Lincoln, Nebraska, Gregg found that "somewhat fewer than half of the first-grade pupils knew the cardinal directions and only a little more than half of the second-grade pupils knew them."[2] In the Nebraska test, as with the seventeen North Carolina children, "The fact came to light that, with some pupils, north and south, east and west merely meant opposites and the directions themselves were not known."[3] Interviews with parents by Gregg indicated that those who knew the cardinal directions had been given special help at home.

Lord reported a study made by George F. Howe of 1300 children in kindergarten through the fourth grade and found incorrect orientation. Following a ten weeks drill program, he came to the conclusion that "children could acquire a clear concept of directions in space es-

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1. Julia Wetherington, Science for the Elementary School, Publication No. 227. Raleigh, North Carolina: State Superintendent of Public Instruction, 1941, pp. 62, 72, 74.

2. F. M. Gregg, "An Important Principle in Teaching Primary-Grade Geography," The Elementary School Journal, 41: 669, May, 1941.

3. Ibid., pp. 667-668.

pecially in Grade III if proper drill is given out-of-doors nearby and away from school."[4]

Lord also referred to a study by Douglas Ridgley in 1922. Ridgley, after interviewing "numerous teachers relative to the ease with which they used directions,"[5] estimated "that fully ninety-five per cent experience considerable difficulty. It is his opinion that, in most cases, the difficulties were traceable to poor teaching."[6] Lord's study deals with the testing of the children in the upper elementary grades, but some of his conclusions are applicable to the primary grades and will be discussed in a subsequent chapter. It is sufficient to note here that children who are expected to be ready for map work are deficient in their knowledge of essential geographic map concepts, and that certain methods, devices, or techniques have been tried and proven to be of help in correcting the prevailing situation.

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4. Francis E. Lord, "A Study of Spatial Orientation of Children," Journal of Educational Research, 34:485, March, 1941.

5. Ibid., p. 484.

6. Ibid.

CHAPTER IV

EXPERIENCES, DEVICES, AND INSIGHTS HELPFUL IN SECURING DESIRED COMPETENCES

Map readiness, like reading readiness, is a composite term including many factors. Experiential background, curiosity about the environment, good observation habits, some reasoning ability, a meaningful geographic vocabulary, and potential orientation ability are the map readiness elements listed in Chapter II. Alert primary teachers recognize readiness to undertake the formal study of maps, not as a phenomenon that suddenly appears when the child takes his place in the fourth grade, but as an outgrowth of proper stimulation in the preceding grades. The teacher who recognizes, meets, and satisfies the child's map needs as they arise, from all angles of the curriculum, is building up to major understandings later.

The writer believes that by capitalizing on the native curiosity of children in the early grades and giving definite instruction in the use and understanding of maps as the need arises, much can be done to eliminate deficiencies in essential map competences in upper grades; the "Ah! Geography!" attitude rather than the "Aw! Geography!"[1]

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1. P. E. Powers, "Ah! Geography!" Journal of Geography, 37:274-77, October, 1938.

attitude will be fostered; and a desire for the stories the map gives, equal to the funny book appeal, may be developed. Ways and means of teaching these pre-map skills are given in the descriptions of experiences, devices, and insights that have been found helpful by successful teachers, or are believed to be valuable by curriculum builders, geography experts, and specialists from map companies.

Areas of Motivation

Renner says "Learning about...geographical processes without basing the learning upon the map is as unreal as the cross section of a mouse would be to a cat."[2] On the other hand, teaching isolated facts, or teaching maps as ends in themselves, or teaching at one stage simply because it will be required at another, is not recommended.

> Since a skill taught in isolation may be less effective than if acquired by incidental learning, the effective way to develop a skill is through the medium of significant subject matter.[3]

Suggestive starting points in the various subject fields are given to indicate that another subject need not be added to the already over-crowded curriculum of the first three grades, but to show there are many stimuli from which the child may grow with proper teaching.

Language Approaches

The need for locating places on a map might grow

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2. George T. Renner, "The Map as an Educational Instrument," Social Education, 4:478, November, 1940.

3. Kenneth A. Fuller, "Teaching the Use of Parallels," Social Education, 8:127, March, 1944.

out of the children's discussion of vacation experiences, radio listening, newspaper items, or movies. Exchanging letters at home and abroad brings in place geography. American Junior Red Cross activities, such as sending boxes to needy children overseas, should give rise to map use. A discussion following a field trip, a comparison of the weather report at home and away, or Sunday School experiences with place names are suggestive starting points. A trip to the zoo or circus should certainly stimulate curiosity about the native homes of the animals.

Reading Experiences Entailing Map Understandings

It has already been pointed out that much of the reading material in the lower grades is of geographic nature and is not readily understood without the use of maps. References to children in foreign lands or stories about general places, such as the seashore, the lake, the mountain, or the west, in textbooks or My Weekly Reader require the use of the map or globe for better understanding. Explanation of expressions like "many, many miles away," "far, far away," "many moons" and such terms as "north" or "south" introduces distances and directions. The need for understanding certain concepts may arise from poems with geographic implications, such as: Stephenson's "Where Go the Boats?" Wynne's "Geography Journeys," or the Old Country Rhymes "The West Wind Brings Wet Weather," and "When the Wind is in the East."

Starting Points in Nature Study or Science

Some writers consider the elementary science or the study of nature in the immediate environment as the geography of the primary grades.[4] Indeed this does give rise to many geographic needs. Field trips, the study of the wind and the weather, bird migration, the seasons, the sun's path across the sky, shadows, sources of food and clothing, and animals are perhaps suggestive enough without further explanation at this point.

Stepping Stones from Other Subjects

Teaching the units of measure--inches, feet, yards, miles--and comparing known with unknown distances are building up necessary map understandings.

Definite map interpretations may grow out of art activities. Several writers and teachers have reported five, six, and seven-year-old children's spontaneous and original drawings of "the world" or a part of it.[5] Noting space relationships in their drawings is preparing for such relationships on maps. Few famous paintings can be properly introduced even at the primary level without some understanding of the homes of the artists.

In music, descriptive songs and travel records may need geographic or map explanations. Motion songs have been

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4. For example, Eunice Wentworth, "Teaching Geography Through Nature Study and Elementary Science," Grade Teacher, 61:22, June, 1944.

5. For example, Muriel Crosby, "Learning to Live in the Wide House of the World," Childhood Education, 22: 377-81, April, 1946.

used to teach or help understand directions. If the lives of composers are introduced at this level, that would entail map reference.

Some parents and teachers have noticed an interest in maps growing out of the jig-saw puzzle.[6] Even the nursery school boy who rode his tricycle around the globe and said "I am riding around the world" had some understanding of the globe.[7]

Other opportunities for map activities may develop when a child moves from one city or one state to another; when a child wishes to locate relatives in the army of occupation or to find out where relatives were during the war; or in connection with holiday celebrations. One first-and second-grade teacher mentioned the use of the globe on Columbus Day, for instance.

This is not an exhaustive list of occasions when the child may need a map, but it does open the way for teachers to think about the use of the map and globe to enrich the teaching in many fields.

Desired Competences and Their Development

The competences listed in the concluding paragraphs of Chapter II are those which will be discussed in this section. Of necessity, there will be some overlapping in the various understandings developed.

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6. For example, Elizabeth Ray, "They Need to be Map-Minded," Parent's Magazine, 20:22, December, 1945.

7. Statement by Mrs. Myrtle B. Wilson, Professor of Education, Appalachian State Teachers College, Boone, North Carolina. June 26, 1948.

Directions

Prerequisite to comprehending the cardinal directions is a knowledge of right and left and up and down. Aids in acquiring this understanding include games such as:

1. Game of pointing to left (or right) ear, eye, foot, shoulder, hand, etc.
2. Directions in games
   a. Run to left
   b. Jump to right
   c. Turn to right
   d. Slide left, etc.
3. Playing "Looby Loo"[8]

Giving opportunities for the child to locate certain objects on the right or left of other objects or to describe the right and left turns from his home to school are other experiences that would aid in acquiring a working knowledge of left and right.

The confusion of "up" with "north" and "down" with "south" often comes from the use of the terms together. All authorities stress the use of the globe, before the presentation of the map, to prevent the north-up and south-down association. Whittemore suggests cutting paper figures with arms upstretched and sticking them with clay on a project globe to help clarify this concept.[9]

It has been generally conceded that the cardinal directions should be presented by having the pupils face

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8. Julia Massey McNairy, An Analysis and Evaluation of Reading Readiness Experiences Described in the Professional Literature, 1933-1943. Master's Thesis. University of North Carolina, 1945. p. 80.

9. Katheryne Thomas Whittemore, "Which Way is North? Learning to Find Directions," Childhood Education, 14:225, January, 1938.

north and then note the other directions from that position. Whittemore believes that the exercise of letting the children draw each other's shadow on large pieces of wrapping paper, cutting out the shadows drawn in the morning, at noon and in the afternoon and writing the time of each drawing on the shadow, will develop the following understandings:

> First, position of the shadow on the side of the object away from the sun; second, the changing position of the sun during the day and the corresponding change in the length and position of the shadow; and third, the relationship between noon, the highest position of the sun, and the shortest shadow.[10]

After this activity, or a similar one with shadow sticks, the child may experience a need for the directions and the teacher will need to make "the simple statement that at noon, when the sun is highest and the shadows shortest, our shadows fall north, and the opposite direction is south."[11]

Directions may also be taught in terms of the position of the rising and setting sun on or about September 23 and March 21.[12] Only general positions may be determined except around these dates. This, of course, would require the pupils to face east and locate the other directions from that position. The main thing is to show them that if they know one direction, the other directions can be computed.

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10. Ibid.

11. Ibid.

12. Florida State Department of Public Instruction, The Course of Study for Florida Elementary Schools, Grades I-VI, Tallahassee, Florida: The Department, 1933. p. 170.

Lord's test with 317 subjects in Grades V to VIII revealed that those subjects facing north during the test were far superior to those facing other directions. In his implications he says:

> There is need, if directions are to function as instruments in orientation, to develop in the child a close relationship between the arrangement of cardinal directions and self.
> Experiences in all sorts of positions should be provided in order that the pattern become sufficiently generalized that one position is no more advantageous than another.[13]

Gregg found by means of an antaxiography, "an instrument which measures involuntary changes in the position of the subject,"[14] that

> evidence seems to indicate that practically every person, when he is thinking of geographic directions, makes some kind of movement, either overt or covert, whether he knows it or not, toward the object of his interest.[15]

He further points out that

> in the light of these discoveries it was concluded that, if bodily or ocular attitudinizing is (with a few unexplained exceptions) an accompainment of directional perception, then in case of disorientation of a subject, a proper orientation could perhaps be established by a deliberate attempt to take correct attitudes for the immediate true directions.[16]

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13. Francis Everett Lord, "A Study of Spatial Orientation of Children," Journal of Educational Research, 34: 504-05, March, 1941.

14. F. M. Gregg, "An Important Principle in Teaching Primary Grade Geography," The Elementary School Journal, 41:665, May, 1941.

15. Ibid., p. 666.

16. Ibid.

Contrary to the opinion of most authorities, Gregg states:

> So far from requiring that pupils face northward in their schoolrooms or that all large maps be placed on the north side of the rooms, it would seem to be better practice to give the ideas and to obtain the accompanying responses of pupils to the actual cardinal directions before map study is begun and thus to make the map the slave of a pupil rather than the pupil the slave of a map.[17]

> Miss Vesta Keeton, of the Training School of Nebraska Wesleyan University, Lincoln, Nebraska, has developed action songs for use in attaining among her pupils a clean-cut sense of north, south, east, and west.[18]

The words of these songs are included in the appendix.

Teaching the cardinal directions "in terms of places in the immediate neighborhood"[19] and writing the directions on sketches drawn of the school community are suggested. Using a compass, noticing the direction of the wind, and connecting the terms north, south, east, and west with the names of local streets, neighboring towns, or states might also give more meaning to the cardinal directions.

Two games are suggested here to give additional experience in telling directions. On the playground the children face a leader who calls first one direction and then another until the four cardinal directions are named. The children face the directions as they are called. Those

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17. Ibid., p. 667.

18. Ibid., p. 670.

19. Alison E. Aitchison, "The Use of Globes and Maps," Educational Service Publications, No. 4, The Iowa State Teachers College, Cedar Falls, Iowa, 1947, p. 1.

who know the directions step out and become leaders of smaller groups until all the children have the directions fixed.[20]

In the classroom a game may be made of following such directions as: "Touch the desk north of you, the one south, the child to the north, south, a north window, etc."[21]

Identification of Landscape Features

Observation out-of-doors, geography's natural laboratory, is the basic source of first geographic understandings. Attention should be called to the natural and man-made features of the actual landscape. This may be needed to make generalizations or draw simple conclusions, such as the flow of water from a high level to a lower level instead of up hill or from bank to bank as some children believe.[22]

Concrete visualization for later map work may be developed if certain features are seen, even in miniature, and identified. Words like branch, creek, river, lake, peninsula, island, mountain, hill, plain, valley, etc., have meaning for the child on a map only as he associates it with the thing in reality. When a child has had a definite

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20. Florida State Department of Public Instruction, op. cit., p. 170.

21. Frank A. Paschal and George C. Turner, Kansas Teacher's Guide, Helps in Teaching Social Studies Units, Suggestions for Teaching Social Studies in the Elementary Grades. Topeka, Kansas: Kansas State Printing Plant, 1943. p. 20.

22. Gertrude Whipple, "Human Geography--From Slogan to Actuality," Elementary School Journal, 41:343, January, 1941.

experience with a river and then is told the black crooked line on the map stands for a river, he recalls his first experience with the term, and the symbol is translated in his mind into the real object. While much can be gained from field trips, only with maturation and much travel experience can one fully appreciate all the symbols stand for. Only when a person visits a city like Chicago, for instance, can he begin to comprehend its vastness. The big dot on a map and the facts and figures concerning its population and area have little significance until one is lost in such a metropolis.

Reproduction of the landscape features on a sand table, with sand or through the media of sawdust and clay, would give increased meaning to the terms. The sawdust, which does not ruin the modeling clay as sand does, may be colored with cold water paints.

If the landscape features cannot be shown in actuality, pictures may be used as substitutes in building the necessary geographic vocabulary. Perhaps the best illustrations and word descriptions of the terms mountain, hill, plain, lake, river and others are found in the third-grade text, Our Earth, by Whipple and James.[23] This book, an outgrowth of much research, is recommended by the Denoyer-Geppert Company.

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23. Gertrude Whipple and Preston E. James, Our Earth. New York: Macmillan Company, 1947. 245 pp.

Use of the Simple Globe

Although no formal teaching of the globe is done in the first three grades, a simple globe showing land, water, the poles, and the equator should be a part of every primary classroom. At least, one should be available for use at any time. The children's questions about it should be answered. Two understandings should be developed from the child's contact with the globe: that it is a representation of the earth and that the earth is round, almost like a ball. The twelve-inch cradle type of globe is particularly recommended for this purpose. It can be held comfortably by the child and he can get the feel of the round earth. Since it has no rod or pole running through it, he may get the concept of the earth's suspension in space.

> He can shift this type of globe to any position so that he can see any part of the earth clearly. For example, he can hold the globe so that he can look directly at the southern hemisphere. In fact, he should form the habit of doing this, so that he doesn't get the notion that south is "down." The cradle globe, too, is most practical because it is free from awkward bases, pulleys, iron bars, and other disturbing paraphernalia.[24]

The northern-southern, eastern-western, and the land-water hemispheres should be pointed out. Modern writers contend there is actually no eastern or western hemisphere, that it is all one world. This theory has been brought out by the air-minded geographers. Nevertheless, half of the earth is still called a hemisphere, however it may be divided, and this can best be shown on a

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24. Isabel K. Billings, "Minimum Essentials in Maps and Globes in the Primary Grades," School Science and Mathematics, 48:217, March, 1948.

globe. Children should be allowed to draw on the first globe, putting in their own signs and symbols as the need arises.

> After the child has the concept of the round earth, an orange peel can be used to demonstrate the flattening process, in preparation for the use of the wall map.[25]

Parker says, "Fortunately neither teachers nor children need understand projections."[26] It is sufficient to point out that the globe is very expensive; it is inconvenient, and it cannot be made large enough to show all one wishes to know about the earth. For these reasons maps have been made.

Making and Using Plans or Simple Maps

A map "is simple if it includes only the map information that pupils can understand and use in their study of geography."[27] For the earliest maps, the child should use his own symbols. His block representation in play may assume an aspect of a crude map. This block scheme or representations on the sandtable may be transferred to paper with the teacher's help and thus become a map. It is suggested that maps be called plans in the first grade and then the name maps applied in the second.

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25. Ibid., p. 218.

26. William S. Gray, Adapting Reading Programs to Wartime Needs, Supplementary Educational Monograph, No. 57. Chicago: University of Chicago, 1943. p. 170.

27. Rand McNally and Company, Suggestions and Teaching Aids for Using the Beginners' Maps in Global Geography. Chicago: Rand McNally and Company, (n.d.), p. 2.

From the beginning, reasons should accompany the making of all maps. If this is done, the child can be led to include those things that are essential to understanding his map and eliminate details. Many reasons were suggested in the literature for making maps. These are: drawing a floor plan of houses when studying homes; making rough diagrams of the neighborhood to locate principal buildings; making a map to show the way to a child's home or the route he takes coming to school; making a map of the town to mark dangerous crossings; showing the route taken on trips about the community; drawing a plan or map showing the routes taken from the local post office; drawing the school yard to label the trees; making a plan of the school room to show where the pupils sit; showing the order of running on a baseball diamond plan; and drawing an imaginative map showing the nocturnal wanderings of a hungry rabbit.

Instruction with the simple maps

> will be more cogent if games are played.... One game is similar to "hide the thimble." A person who is "it" may hide an object, say, in season, an Easter egg, anywhere in school or on the school ground. The others will have no inkling of the object's location except from a map indicating where it is placed. The one who finds the object becomes "it." This game and other varieties of it may be played with sides.
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> A variety of "treasure hunt" may be used if great complexity is desired. Here there is a series of maps, the first showing where the second map is found, the second where the next is found, and so on, until the last map which shows where the "treasure" is found. The first who finds the "treasure" becomes "it" for the next game, reconstructs the maps, and hides them and the "treasure...."

> By acquainting the child with maps of those things with which he is familiar, by having him actually make these representations himself, and by having him play games with the aid of maps, the child will be initiated into this useful study properly.[28]

Familiarity with Geographic Terms

A meaningful geography vocabulary is definitely essential before meaning can be derived from maps. As with the printed page, the more experiences the child carries to the map, the more he gets from it. A map vocabulary would include those terms already mentioned and discussed: the cardinal directions--north, south, east, and west; land and water forms--mountain, continent, lake river, ocean, etc.; and the terms map and globe.

One game used by the writer has been found very helpful in fixing the meaning of these terms. The leader describes a certain geographical term and calls on someone to guess what it is. If he guesses correctly, then he becomes the leader. A variation would be to have the pupil locate the term in the environment or on a map if the term were of such a nature it could be located. For example, the leader might say, "I am the only true representation of the world. What am I?" or "I am a great, big, salty body of water. What am I?"

Another game will indicate the children's understanding of the comparative sizes of related terms such as:

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28. Arthur C. Selke, "Beginning Steps in Map Study," Educational Method, 18:34, October, 1938.

village, town, city; branch, creek, river; pond, lake, ocean; state, country, continent, etc. By signs agreed on by the group, the children could indicate whether the feature called was small, medium, or large in size.

After the names of specific rivers, cities, and states have been learned, the parlor game, "River, City State," may be used. In this a leader stands before the group, calls "River, City, State," and then suddenly says one of the three as he points to a pupil to name whatever is called before he counts ten.

Addressing envelopes in language or writing one's own address should give rise to an explanation of the difference between the post office and the state.

Throughout all the activities mentioned in this section, children may become familiar with the necessary geographic terms.

Seeing Views or Pictures of Cultural Regions Throughout the World

It is impossible for children to travel to all the regions of the world that will be found on the globe or map. Pictures then become the basic laboratory material in presenting to the child concepts of regions he cannot see. Pictures of places mentioned in the child's reading or discussion will give meaning to the place when its name is used and it is located on the globe or map. These pictures should include: plant life in various localities; animal adaptation to various climates; bird migration and adaptation; views a

traveler might see of dry-wet lands, warm-cold lands, inhabited and uninhabited, small bodies of water and large; homes in parts of the world and dress in different lands. Sequence pictures have the funny book appeal and are considered good. The book, Our Earth, mentioned earlier in this chapter, is excellent.

Understanding Simple Scale of Measure

Understanding "what is in the mile behind an inch on a map or globe"[29] is difficult even for adults. Primary children need not know too much about this. Using various size globes help to convey the idea that the globe is merely a representation of the earth and its size depends on its use. Reports have been made that third graders gained the elementary facts about scale by making maps of the schoolroom, using one inch to one foot, and then of the playground and the town.[30, 31] It is the writer's opinion that it would be an advanced group that could do this with any degree of accuracy. The Course of Study for Florida Elementary Schools suggests step by step procedure for drawing the room to scale in the third grade.[32] Forsyth suggests beginning

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29. Mamie L. Anderzhon, "What is in the Mile Behind an Inch on a Map or Globe," Journal of Geography, 44:288-95, October, 1945.

30. For example, Elizabeth Dudley, "Approach to Map Study," Journal of Geography, 36:354-56, December, 1937.

31. For example, Margie Clayton, "The Third Grade Studies Maps," Instructor, 49:25, October, 1940.

32. Florida State Department of Public Instruction, op. cit., p. 380.

the use of the scale by comparisons with pictures of people.[33] Show first the picture of the whole person. Then show only the head enlarged greatly. This comparison could then be transferred to different size maps, with the explanation that when one wishes to see an area larger than it can be shown on a map of the world, for instance, the area has to be put by itself. The children will need to be told that the size shown on a certain map does not always indicate its actual size. If the children draw floor plans of the room to scale, various sizes should be made to show that the same thing can be shown on a larger or smaller scale than the first one used.

Understanding the Simple Symbols

The symbolic language of maps begins with the child's own symbols on pictorial maps. When making a map of a farm, for instance, the child will probably draw in the roads as they would be on a diagram, but make pictures for the house and barn. Gradually the teacher may show him the house or barn might be in the way of other things he wishes to show, and the shape of the buildings might be used instead of pictures. If proper visualization has been made, the rectangle with the circle on the end will be translated to mean the barn and silo.

The colors on the first globe should be explained upon its presentation. Later the various land shapes will mean

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33. Elaine Forsyth, "Map Reading," Journal of Geography, 42:327, December, 1943.

specific continets. Whittemore[34] says the symbol of a city might be introduced when a city is mentioned in the news and the children take an imaginary airplane trip to the city. If in their imagination, they fly high enough, even a large city will appear as just a dot in the distance. The dot may then be placed on the globe and allowed to remain several days before the name of the city is written beside it. This eliminates confusion of the city's location.

> Pictures should be correlated with map symbols throughout the work of the grades, not only to help in the introduction of map symbols, but also to check and test what meaning such symbols have for the child. The teachers of the class learning the symbols for land and water might point to the blue on the globe and say, "When you look at this blue on the globe does it make you think of this, or this, or this?" showing them in turn pictures of a farm, a city, and an ocean.[35]

First maps should have a key explaining the colors and other symbols used. Toward the end of the third grade when the continents and oceans have been identified on the map, the game "Playing Guide" may be used.

> Let a pupil choose another to act as guide on a trip. The guide takes his place at the map and points out the continents and oceans as they are named by the pupil making the trip. If he is able to point out those correctly, he chooses a guide and takes a trip.[36]

Interest

The most perfect methods and techniques of teaching

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34. Katheryne T. Whittemore, "Learning to Read Maps," Childhood Education, 14:175, December, 1937.

35. Ibid.

36. Florida State Department of Public Instruction, op. cit., p. 381.

are useless without the teacher. Whether the map becomes a valuable and fascinating tool of geography to which the child will turn as he turns to books he likes, or whether his interest will be killed in the beginning is determined largely by how the primary teacher handles his first interest in the subject. The idea that children do have a definite curiosity about maps prevailed throughout the literature.

Reading Simple Diagrammatic Maps

Competence in reading simple diagrammatic maps is closely related to making and using maps and the understanding of symbols already discussed. Pictorial maps are easily used by adults and children, but the introduction of symbols requires much practice. One first-grade teacher told how the mature children of her class made little boats and "traveled on the water" of a Mercator map, naming the places at which they docked. They made a game of it themselves.

Conceptions of Distances

Most little children, according to their teachers, have very little conception of distances. Familiarity with a path makes the distance seem shorter than when it was first traveled. The child may say it is just a little way to his home, for instance, but it may be a very long trip for the tired teacher at the end of a busy day. If known distances of one, five, or ten miles have been traveled by various children, then comparative distances may be made with places twice as far or three times as far away. A mile walked with

the children will give a standard for short distances. The kinesthetic sensations involved in experiencing this unit of distance would increase the child's appreciation of greater distances. It would probably mean even more if the mile could be visualized before it is walked; if the teacher could say, "When we walk from here to a certain landmark, we will have walked a mile." Noting the quarter and half mile posts should be a part of this visualized and walked mile. A child's concept of distance is determined by his personal experience with it, whether walked or transversed by wagon, car or airplane.

How long it takes to go, how long it took a relative to get home from a far away place, or how many days are required for a letter to reach a certain destination may have some meaning. To children who followed a father from camp to camp during the war, a long distance may mean recalling a very tiresome experience.

Appreciation of Size of World

This factor requires more understanding of distance than children can possibly have. Children with no travel experience are shocked to realize their own town or state is not the greatest part of the world. Some idea of the expanse of the world may grow out of a post office unit in which the spread from the local post office to the state, to the country, and to the world is made. If third graders get the concept of a mile being included in an inch of a drawing of the community, the following fact might have

some significance. If a globe could be made with one inch equaling one mile, it would more than cover a city block.[37]

Picture Maps

Pictorial maps have more meaning for the primary child than any other kind. They are more nearly typical of the conception of maps young children express. They may be made to illustrate real or imaginary journeys or they may be used only as wall decorations. Recently the writer noticed such a map illustrating the inside covers of the story of "The Three Bears." Stories in which the characters draw maps for each other are found in the books for the primary children. Even young children may draw their own pictures on maps to show where vegetables are found in their community, for instance.

Concept of A Round Earth

This idea, as has already been pointed out, is probably best developed with the frequent use of the globe in early grades. The oblique orthographic map, which resembles a picture of one side of the globe, is often the only map given to the child until the roundness of the earth is firmly fixed in his mind. The oblique or perspective map gives an excellent idea of how the world would look to "an incredibly far-sighted man poised at an altitude of many thousand miles."[38]

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37. Marie L. Anderzhon, op. cit., p. 291.

38. Richard E. Harrison, "Perspective Maps--Harrison Atlas Gives Fresh New Look to Old World," Life, 16:56, February 28, 1944.

Sites says of this:

> We venture the prediction that the time will come when no social studies or geography text, designed for grades below the fifth, will contain any other kind of map. This type of map used along with the free globe will develop a spherical concept in the minds of the children so well that the distorted flat world map can be used for the purposes which it can best serve without giving a wrong idea of the world to the student.[39]

Outline Map of State and of the United States

Whether this concept will be taught in the primary grades will vary greatly with the interests of the children. One third grade learned the names of the states; the directions, north, south, east, and west, and which states are located in these sections, the various markings which indicate capitals and relative population of cities by pasting postmarks on a fifty-by-thirty-inch map of the United States. Each child wrote his name in every state in which he had visited and put a red circle around the postmark of the capital cities.[40] This is an advanced project for third graders in the opinion of the writer. Only one reference was found which indicated that children should know the shapes of the state in which they lived and the country, and no methods were offered for developing these concepts.

No attempt has been made to set a value for each of the activities discussed in this study. The fact that

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39. D. E. Sites, "Some Problems of Map Publishers Related to World War II," Journal of Geography, 44:148, April, 1945.

40. Margaret H. Simpson, "Interest-Stimulating Device; Learning the Map Thru Postmarks," Journal of Geography, 43:272, October, 1944.

accounts of the experiences and devices were worthy of a place in the professional literature or in the opinions of teachers was the only determining factor in including them in this research.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

In Chapter I the title, "Anticipatory Experiences Leading to Competence with Formal Maps," was restated in the questions:

1. What is expected by way of competence at the end of the third grade?

2. What competences are found in the first, second, and third graders?

3. What experiences, devices, and insights are helpful in securing the desired competences?

4. What recommendations can be made in the light of this study?

A survey of periodical literature since 1935, interviews with first, second, and third grade children and their teachers; and the offerings of map companies revealed the following generalizations:

1. Some inconsistencies were found in the writings. For example, in condemning the Mercator projection many writers used the common comparison of the size of Greenland with South America. One says Greenland is one seventh the size of South America; another says it is one ninth and another one tenth its size. Actually Greenland is 837,620 square miles in area and South America is 6,846,000 square miles.

2. There is much disagreement about the polar map fad versus the Mercator projection. One writer suggests unity of the two polar hemispheric maps and Mercator's as the solution. Several authorities believe it should be excluded by law from the classroom.

3. All writers on the subject agree that while one can take a bear's skin and make a flat rug, one can never take a spherical earth and map it on flat paper without distortions. "Every good map like every work of literature tells at least one truth."

4. There are many articles expressing the map-mindedness of the general public and suggesting better teaching practices as evidenced in the 373 articles surveyed for this study.

5. Most writers stress the elevation of geography to the secondary level of education. Few writers are cognizant of the keen curiosity of children under ten years of age.

6. Several tests of children's misconceptions of maps and deficiencies in essential map competences have been made in upper grades and remedial programs were suggested.

7. Few studies have been made to prevent these misconceptions by proper pre-map training.

8. Most writers suggest children's making simple maps of a known area as an initial step.

9. The project problem or simplified globe is recommended for the first global contact.

10. The use of the oblique orthographic map or a modification of it is the starting point in third grade reference books.

11. Cartohypnosis is common in innocent adults. Children should learn at an early age that not everything on a map is accurate.

12. The teacher who presents maps without preliminary teaching of the map skills is to blame for the "Aw! Geography!" instead of the "Ah! Geography!" attitude, failure, and adult indifference to the stories maps may teach.

13. Parents may share in contributions to map training.

Recommendations

In the light of the foregoing conclusions the following recommendations are made to teachers in the primary grades:

1. The cardinal directions should be taught in the first grade and reviewed each time the child changes classrooms. This should be done in relation to the sun shadows at noon or in relation to the rising and setting sun. Games and other activities may be used to fix this learning.

2. Much critical observation should be done in the immediate environment, noting the causes and simple relationships of the various features in the landscape.

3. Every primary classroom should be equipped with a twelve-inch, cradle type globe. Children's questions about it should be answered. It should be handled, written on,

and talked about as the need arises in the many phases of the primary curriculum. Its use should precede map study.

4. Many simple maps, made by the children alone and with the teacher's guidance, should be used in the primary grades. Reasons for their use should be clearly determined.

5. A simple geographic vocabulary developed through observation on field trips, with the aid of pictures or other media, is essential to children about to enter the study of formal maps.

6. Many pictures of cultural regions throughout the world should be used to help children visualize the parts of the world they cannot see in reality.

7. In the third grade the simplest introduction may be made to the scale of measure. Drawing the floor plan of the classroom is perhaps the easiest way to do this.

8. Symbolism on maps should be introduced as carefully as the first grade teacher prepares the child for the symbolism of the printed page. No symbol should be introduced until the child has a visualized concrete image for it and until the need for it arises.

9. Primary teachers should be alert to the many opportunities when maps and globes can be used to stimulate interest in their study.

10. Concepts of distance should be built up from group experience with walked distances. Otherwise, this understanding will vary with each child's experience of it.

11. The feeling of sphericity and the vast expanse of the earth's surface should come through contacts with the globe and a knowledge of distance.

12. Extreme care should be exercised in giving the child his first commercial map. Map readiness should be anticipated and pre-map skills developed. If this has not been done in the first three grades, the fourth-grade teacher should present the map-readiness elements before expecting children to experience interest and success in the study of maps.

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APPENDIX

APPENDIX A

PRIMARY GRADE ACTION SONGS FOR MASTERING GEOGRAPHIC DIRECTIONS

By Vesta Keeton, Training School, Nebraska Wesleyan University.

NOTE. In singing these songs, the children should face in the successive directions and either mark time as they sing or point in the direction, or both, or as otherwise indicated. Sing both indoors and out.

Here we go to'rd the Northland cold,
Northland cold, Northland cold.
Here we go to'rd the Northland cold
Where Santa Claus labors and never grows old.

Then off we go to the East so bright,
East so bright, East so bright.
Then off we go to the East so bright
Where the sun comes up at the end of night.

Next to the South where the sun is high,
Sun is high, sun is high.
Next to the South where the sun is high,
And shadows creep to our heels so nigh.

Now off to the West where the sun goes down,
Sun goes down, sun goes down.
Now off to the West where the sun goes down,
And the sky puts on it a golden crown.

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Away we skip, away. Bow to the North,
Salute the South, and wave to the East.
Away we skip, away. Come wave to the West,
Then North, South, East, and West.

The North is where the white bear lives.
From East the Giant Panda came.
Down South in trees the monkeys climb.
Out West the big brown bears recline.

Come bring the sleigh bells here, jingle north we go.
Get the sleigh and reindeer out, ready for the snow.
When at the East we'll leave--a load of toys so new,
And see if all the children there are happy children too.

Chorus
Jingle bells, jingle bells, jingle North we go,
Play Santa Claus the whole world o'er,
  while sliding on the snow.
Jingle bells, jingle bells, jingle all the way,
What fun to carry loads of toys North,
  South, East, West each day.

Then travel to the South, making long stops there,
See children smile and bid us stay to give toys everywhere.
We'll hurry, hurry West, they're waiting for us too;
They need such toys as others like and all good children do.
Chorus