A STUDY OF THE TRENDS IN METHODS AND CONTENT OF
NATURE STUDY TEACHING IN THE PRIMARY
GRADES IN TEXAS SINCE 1900

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GRADES IN TEXAS SINCE 1900

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CHAPTER I

INTRODUCTION

Statement of the Problem

The problem of this study is to determine the trends in the teaching of Nature Study in Texas with reference to the quantity and quality of printed materials for primary grades and the trends in methods of presenting them.

Sources of Data

The data for this study were secured from the following sources: (1) The North Texas State College Library, (2) The Office of Education, (3) The North Texas State College Student Teaching Laboratory, (4) The North Texas State College Demonstration School Library, (5) Stephenville Public School Library, and (7) Tarleton State College Library. Much use was made of courses of study and of state adopted readers and elementary texts for Texas.

Methods of Procedure

The introductory chapter is concerned chiefly with the review of related studies, the definition of terms and the limitations of the study.

Chapter II is a discussion of The Trends in Methods of Teaching Nature Study. In an analysis of the methods used this general plan was followed:
1. A brief history is given of trends in the early part of the century as disclosed in books written in that period.

2. A discussion is given of the suggested outlines in the manuals and courses of study for the state of Texas from 1915 to 1945.

3. Related articles and books are discussed.

Chapter III is a discussion of The Trends of Content in Nature Study Teaching. In this analysis this procedure has been followed:

1. A brief history of subject matter as shown in early literature is given.

2. A critical analysis is made of the content of selected readers adopted by the state in 1920-1950.

3. Manuals, guides, related articles and books are discussed.

Chapter IV gives a summary of the trends of Nature Study teaching in the primary grades and the writer's conclusions based on these data.

Definitions

A number of definitions have been suggested in the past for Nature Study. A few of them follow.

In the manual and course of study outlined by Anne Webb Blanton for the elementary grades of the public schools of Texas for 1920, the following definition is given: "Nature Study is geology, botany and zoology made simple and couched
in terms that the child can understand." Again she said, "Nature Study is the manifestations of nature and their relation to man."  

Arthur Newton Pack, co-editor of *The Nature Almanac* for 1927, expressed his views thus: "Nature Education is a general term covering a multitude of corollaries. Some may prefer the term 'Elementary Science'; others may lean to the simpler 'Nature Study'; while leaders of outdoor camps may advertise 'Nature Lore.'"  

S. Ralph Powers, chairman of the committee on science investigations for The Thirty-First Yearbook, published by the National Society for the Study of Education, in 1932, said: "Science for the elementary school has been organized as Nature Study." Harrington Wells, Professor of Biological Science, Santa Barbara State College, Santa Barbara, California, in 1936, classified Nature Study as a phase of Elementary Science.  

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5 Harrington Wells, *The Teaching of Nature Study and the Biological Sciences*, p. 90.
Many books recently written for children are called Science Books. In *How Do We Know?*, a teacher's manual and guidebook, Wilbur Beachamp says, "A fundamental aim of an adequate science program is to stimulate and guide the pupil in a constantly growing understanding of the forces, elements, materials, and living things which together make up his everyday world." 6

For the purpose of this study the following definition will be used: Nature Study is the stimulation and guidance of the pupil in a constantly growing understanding, use, and appreciation of the forces, elements, materials, and living things which together make up his everyday world. "Nature Study" and "Elementary Science" will be used interchangeably. The word "trend" in this study is used to denote a sustained movement in a given direction. The "primary grades" in this study include the first three grades of the public schools of Texas.

**Limitations of the Study**

This study is confined chiefly to the state of Texas, but a comparison with the data of *The Thirty-First Yearbook* and *The Forty-Sixth Yearbook* of The National Society of Education and other authoritative sources for the country as a whole is attempted. The analysis of readers adopted

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6 Wilbur Beauchamp and others, *How Do We Know?* Teachers edition, p. 4.
by the State of Texas at ten year intervals was limited to Third Grade readers.

Related Studies

In a thesis published at North Texas State Teachers College in 1939, Miss Lillian Coldwell made a study of the development of Nature Study from 1898 until 1938. It was based on a study of available printed materials for teachers in the form of manuals and books, on selected adopted readers for children, and on other nature textbooks.

The content of the subject-matter in the children's books was determined by listing in tables all words pertaining to Nature Study, both physical and biological. From this study she concluded that Nature Study was very popular in the early period of this century, lost its popularity in later years, and then regained it in the past ten years. Miss Coldwell found that whereas formerly the science was on the teacher's level, recently it had been written on the child's level, a practice which had stimulated the child's interest in and appreciation of Nature Study.  

In a thesis published at North Texas State Teachers College, in Denton, in 1945, Miss Josie V. Kindred made an analytical comparison of the elementary science programs of a number of elementary schools in Texas and of several

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schools in other states. She compared units of study outlined in the courses of study in various cities. She further compared these and the units in state courses of study with the science units outlined in The Thirty-First Yearbook of The National Association for the Study of Education.

She concluded that on the whole the schools investigated had been patterned to a greater or lesser degree according to the plan given in The Thirty-First Yearbook by the committee on the teaching of Science. She further concluded that in 1945 there was a definite trend in educational movement toward the inclusion of more science in the elementary grades. She recommended the use of The Thirty-First Yearbook by any and all schools needing to organize or revise their science program.

In a thesis published at the North Texas State Teachers College in 1936, Ina Louise Thurman made a study of the nature interests of a group of first grade children of the Demonstration School connected with the College. The techniques employed in the investigation were those of direct observation and analysis. Miss Thurman found that children's interest is seasonal; that books and pictures play a minor part in the study of nature; that they would much rather

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have the real object or specimen to observe and study. Further, she insisted that Nature Study does not need to be taught as fantastical or mythical; it is more interesting in its true form.  

A study of the trends in reading was made by Miss Cora Grace in 1949. In this study she made an analysis of a series of basic readers through the first five grades. In tables showing the subject content of nine readers, nature stories, animal stories, and science stories were listed separately. This thesis differs from that of Miss Grace in that it is a study made specifically of Nature Study trends and in it the three groups of stories are treated as one.

She found that little science material was included in the earlier readers (1875-1905); whereas in the later readers (1905-1945) much space was devoted to science content. She concluded that at the first three grade levels the majority of the selections dealt with nature studies, that there was less poetry used in these grades than in the earlier readers, and that there was a strong trend toward more realistic material.  

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CHAPTER II

THE TRENDS IN METHODS OF TEACHING NATURE STUDY

Our accepted aim in present day education is to encourage children to think and judge for themselves, and the methods we adopt should be in harmony with this aim. Educators realize that there must be an educational program that will be supported by scientific information. Arthur N. Pack, in a section entitled "Why Nature Education," in the Nature Almanac for 1927, said:

The complexities of civilization lead us continually around the corner to confront Nature either as an enemy or friend. No graver error can be committed than to overlook the fundamental laws of balance exemplified in Nature and now so clearly crystallized in flood problems and forest destruction. Not one individual may be found for whom these issues do not affect the cost of living. They will remain to be solved by a generation wise in the laws which make the world of living things—a generation fundamentally grounded in Nature Education.¹

To solve the problems of life in any period one must necessarily understand the underlying principles of nature.

Nature Study has always been advocated. Some think of it only as a love of nature and believe in looking for the divine in nature. In the past it was thought that the child should see and learn about the beautiful things only. He was shielded from the truth in many cases when the truth might have helped him in solving some problem or in achieving his purposes.

In earlier days children did not have the wide choice of books which they have today. In 1909, F. A. Merrell, of the Department of Nature Study, at Athens, Georgia, made this statement: "Nature Study must always be a study. It cannot be successfully taught from a book." Yet he conceded that Nature Study should open the way to the sciences by creating a desire for knowledge. He went on to say, "It is not advisable to teach it without references to those great authorities who have spent their lives in developing the knowledge we call science. Object teaching is highly advisable but ready references should always be at hand."\(^2\)

This procedure, in which nature study is given by the teacher without written materials being in the hands of the children, is illustrated in a book written by Lucy Langdon Wilson in 1897. In her book *Nature Study in Elementary Schools* she gave detailed plans for the teaching of Nature Study. The book was written for teachers, however, and not for the child. It contained small pictures and diagrams that would not be attractive or very understandable to children. The child was to learn what he could by observation, but the teacher must read for the facts and then impart those facts to the child.

In 1915 it appears that Nature Study was still not taught "as such" but incidentally, although it was strongly advocated.


\(^3\)Mrs. Lucy L. Wilson, *Nature Study in Elementary Schools - Teachers' Manual*, p. 5.
The outline of the course of study for the elementary grades of the state showed that Nature Study was to be "under the direction of the teacher" in Grades One and Two, and geography substituted in the Third. Only two readers were listed for the primary grades, Hill's Reader and Art Literature being used in the Second and Third Grades. For Physiology and Hygiene, the book was to be put into the hands of the teacher only, unless adopted for pupils by the local board of trustees.  

The 1918 manual and course of study for Texas showed that the same two readers were in adoption and that Nature Study was listed for the first two grades, but there was no printed material for this subject. Geography was substituted for Nature Study in the Third Grade, but the book Tarr and McMurry's World Geography Book I was not to be read by the children. In the course of study it is stated:

Since the book is in the hands of the teacher only, pictures, stereopticon views, post cards, excursions, collections of material, and the sandtable may be used to the greatest advantage in making the work alive.... Lessons should be carefully prepared by the teacher, and the subject presented to the child in story form, by means of questions and by description.

Again, in 1920, Nature Study in the Third Grade was taught in connection with Geography. Nature Study, geography,

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2 Ibid., Course of Study, 1918, Bulletin 88, p. 58.
and agriculture were outlined "so as to form a continuous course beginning with the First Grade and extending through all the grades in the elementary school. Upon such a foundation as this, the science course of the high school may be safely built." The course of study recommended that all children be made familiar with plants and animals grown on Texas farms, with special study given to what was grown in one's own environment. Excursions to cotton gins and woolen mills were suggested. Children should be encouraged to have gardens and plant flowers and vegetables.

According to the state courses of study in 1924 and again in 1927, Nature Study was to be taught primarily by the observation method. In the manuals for these years the same methods of presentation were suggested. Correlation with other subjects was recommended. Seasonal changes were to be observed, and excursions made after making definite plans for them. Some other activities listed were keeping a record of birds that stay the year round and of those that do not; studying plants in green houses; making a study of clouds, vapor, ice, and other natural phenomena, and of man's adaptation to nature in various climates. In the spring children were to be out of doors as much as possible studying wild flowers (particularly the state flower),

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6Ibid., Course of Study, 1920, Bulletin 105, p. 47.

7Ibid., pp. 50-51.
trees and insects. Harmful insects and ways of exterminating them should be discussed.\textsuperscript{8} It was further stated: "A good text on Nature Study may be profitably used in the hands of the teacher."\textsuperscript{9}

Bulletins put out by the State Department of Education in 1933 and 1934 suggested that Nature Study be correlated with all other subjects. The standard of attainment was to stimulate interest in birds, flowers and animals, to develop the habit of careful observation, to create a desire for the literature of nature in prose and poetry, and to promote a sense of responsibility for the care and protection of birds, animals, and plants. As an example, a wild flower unit was given, with suggestions for the study of seeds, bulbs, soil, annuals and perennials.\textsuperscript{10} Activities suggested were (1) correlating the study of wild flowers with all subjects; (2) checking readers for flower poems and stories; (3) collecting pictures; (4) pressing flowers, and (5) planting seeds and watching them grow.\textsuperscript{11}

A tentative course of study for the first six grades was outlined by J. C. Mathews, State Department Director for 1936. It was the result of diligent study of an executive committee and of educational leaders of the state toward revising the

\textsuperscript{8} State Department of Education, \textit{Manual and Course of Study}, 1924, Bulletin 184, p. 82.

\textsuperscript{9} Ibid., \textit{Course of Study for Elementary Grades}, 1927, Bulletin 226, p. 126.

\textsuperscript{10} Ibid., Bulletin 324 (1933), p. 10.

\textsuperscript{11} Ibid., Bulletin 337 (1934), p. 10.
curriculum. In the Nature Study section, as in that devoted to other subjects, the unit plan was suggested, with objectives, many pupil activities, and teaching procedures given. Briefly, some of the methods given were as follows.

For "Controlling Harmful Insects" the objectives were (1) knowledge of kinds and appearances of harmful insects and (2) skill in destroying insects. Many activities were listed for the children. Among them were observation of insects; finding out from the florist how to kill certain insects; making posters; telling any experience at home or elsewhere which taught about damage done by termites, boll weevils, borers, Japanese beetles, and other insects; and finding out how to rid the home of cockroaches and harmful insects. To the teacher the advice was to confine the study to the most common insect pests of the community.

In "Caring for Water Animals Producing Their Young," the use of an aquarium was suggested. Study of the life cycle of frogs and fish could be made from observation. In the unit "Finding Out How Texas Wild Animals Live," trips to a zoo and to a museum were suggested. The children were to read stories about interesting wild animals, "such as beavers that build dams, seals that travel to a warmer climate in winter, and tame bears in Yellowstone National Park." Individual reports might be made on various animals in this state. By use of small pictures the most common animals were to be placed on a map of the state. The relation between wild and tame animals might be brought out through comparison of those that have
similarities. Stories and poems might be written and illustrated. In teaching about native plant life and native animal life, conservation of resources should be stressed.

Seven more units for the Third Grade, with detailed plans of presentation were given, protection of wild flowers being one of them. Two problems discussed were (1) finding the differences between static electricity and magnetism and (2) finding out how rocks help make soil. In the latter, one of the concepts to be gained is "that the earth is very old." In addition to observation, field trips, and reading, a number of experiments were suggested. Many references to good books and materials for children as well as for the teacher were given.\(^{12}\)

The 1943 course of study for elementary education in Texas was prepared under the supervision of Edgar Ellen Wilson, Director of Elementary Education. In accordance with this report, the child should, through study of nature materials close at hand, increase his knowledge of and interest in plants and animals. He should observe the habits of animals, the development of seeds, the growth of plants, the changes in the length of days, the temperature, and other common phenomena such as dew, snow, rain and hail. He should engage in such other activities as going on field trips; collecting specimens; caring for pets

at school; making booklets, spatter paint prints and seed charts; collecting literature on plants; growing plants; and keeping a weather calendar. Nature Study was to be integrated with other subjects, particularly with social studies. Further, according to the report, "Radio and visual-aids should be used extensively to increase interest, appreciation and understanding of one's dependence on the world of science."

The science division in the 1945 suggestive outline is an exact duplicate of that in the 1943 bulletin. This 1945 course of study outlined by the state was the last one available to the writer. By way of comparison and of carrying the study of methods of teaching Nature Study further, magazine articles, studies made by some authorities in the field, and other courses of study and manuals have been used.

In an article in the September 1918 issue of Education, Esther Cunningham stressed the great need of more nature study. She said: "The birds that come once or twice a year are not enough." Also, Nature Study would have to be made very meaningful. She said, "What child cares to learn about the anatomy of a frog? He must be led up to it by degrees, first learning what the frog does all the time." Further, she said, "The life of a butterfly is as interesting to most children as

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a fairy tale." The classroom should contain things to be watched, such as cocoons, seeds, tadpoles and plants, "filling the atmosphere with love of nature." The establishing of a museum and the correlating of music, art, and language with nature study are among suggestions given for methods of making the subject matter interesting. During the music lesson the students could learn something about bird music. 15

In 1924 E. Laurence Palmer wrote an article in the June issue of the magazine Playground, in which he suggested a method of combining Nature Study with recreation by using it in games on the playground. Two such games suggested were "The Pollination Game" and "The Rabbit Race." He said, "Through the playing of these games and through dramatization children will gain comprehension of many things they might not otherwise get." 16

After attending "The Nature Study Guide School" of The Western Reserve University, Cleveland, Ohio, in the summer of 1929, some teachers went back to the city with new ideas about the methods of teaching Nature Study. Consequently, a "Home Room Pet Shop" was established where all sorts of animals were brought. To get ready for the animals, the pupils engaged in many activities. Besides learning

about care of animals, their habits, and their reproductive processes, they made trips to museums, zoos, a canary show and a fish market, where they listened to outdoor lectures. The study of animals was carried on in reading, writing, poetry and creative art. Charts were made; footprints were studied; and stuffed animals were displayed. The author who wrote the story in the May, 1930, issue of *Childhood Education*, concluded that children should be given opportunities for rich experiences in the study of animals.\(^{17}\)

At approximately the same time, Carrie B. Huntley wrote of a summer nature camp for children. "The Nature Guide School" was conducted for the school children in Hudson, Ohio. A loose leaf notebook was used on the various trips. It contained lesson keys on trees, flowers and birds, and places for poems, for stories, for sketches with identifications, and for pressed flowers. From this camp Nature Study was carried back into the homes and into the regular school activities in the fall.\(^{18}\)

Miss Rose Wathley, an elementary supervisor of the West Hartford, Connecticut, schools in 1931, said that Third Grade children should have developed a keen sense of observation and should be active in bringing specimens and in asking questions about them. Children should be encouraged to read for


information upon unknown subjects in nature. She also recommended integration of Nature Study with other subjects. The making of booklets for poems, drawings, and pressed flowers was recommended. Children, she said, should be taught how to use thermometers, facts relative to the hibernation of animals, and the value of snakes in destroying harmful insects.  

By 1932, Nature Study units were popular. A typical unit, "How Nature Prepares for Winter," was presented in the November 1932 issue of Childhood Education. The activity grew out of the children's interests and directly from a discussion and dramatization of how farmers harvest their crops. The teacher served as a guide and kept the activity going by her enthusiasm. Observation of bees, ants, and other insects brought out how they get ready for winter. The children made an excursion to Lake Park, where the supervisor told them about animals that hibernate. They were shown how plants live on in seeds, roots, and bulbs. At school the children made a chart showing how seeds are scattered. Further reading by individuals or groups increased their knowledge of how plants and animals get ready for winter. Many activities were engaged in until eventually the group was learning about how people prepare for winter. A further activity along this line was concerned with keeping warm. The art teacher helped the children in the weaving of

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rugs, the making of booklets, and similar activities. The children rounded out the unit of work, which lasted about a month, by giving an original play in an assembly program. They also showed the audience their drawings, paintings, and seed charts, and gave nature rhythms.

Articles appeared in various magazines on how Nature Study might be blended with other subjects. Elise Boylston wrote in the June, 1933, issue of School Arts of the blending of Nature Study with art. She spoke of "how blessed is one who finds art in nature, adapting what is found to colorful design, and learning to appreciate the spirit of the flower itself." After telling about the use of crayolas and splashy colors in freehand drawing, she suggested booklets for the assembling of drawings, folders for separate specimens, and envelopes for keeping sets of materials.

In an article published in April, 1934, in Science Education, Otis W. Caldwell said, "Experimentation in schools is commonly accepted as one dependable method of finding what and how to teach." He spoke of one course of study that explained in the beginning that the course outlined was based on ten years of experimentation. He cited Craig's important research, resulting in valuable instructional organization.


One popular trend of thought regarding the teaching of science in 1936, according to David Russell, was to provide an early science program that would encourage the practice of scientific thinking. In regard to this and to one method of procedure he said:

This is a scientific age, it is claimed, so scientific thinking and scientific methods should be employed by children as early as possible.... It is not reasonable to suppose that elementary science must correlate and be integrated at every instance. Separate units have been very effective, they have motivated interests and created new ones, and have provided an understanding of genuine scientific concepts.

According to Russell, there is no such thing as a "child-centered" classroom. He stated that whatever method is used—an incidental method, one based on the child's everyday experiences, or the unit method—the real outcomes of the curricula depend upon the children, the environment, the equipment, and most important of all, upon a teacher with personality and a background in training and experience. 23

In the article "Science and Elementary Curriculum," in the May, 1937, issue of Teachers College Record, Gerald S. Craig made this statement: "It would seem that at least the following four types of activities must play an important part in the teaching of science in the elementary school in the future: (1) discussion, (2) experimentation, (3) field

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trips, and (4) reading." He said that free discussion is necessary in defining the problems, developing the method of solution, revealing misconceptions, and utilizing critical thinking. Experimentation assists in the interpretation of phenomena and in the development of scientific attitudes. Children should be given ample opportunity to study in their natural habitat. Opportunities for teachers to prepare themselves to guide their pupils in the study of the science of the out-of-doors are now available. Furthermore, the study of science cannot be complete without resort to authentic literature. Craig believed the members of a group should learn that they cannot rely upon discussion, experimentation, or field trips in any final sense. They must go to authorities for the best explanations.  

Problem-solving and experimentation to develop science concepts is stressed by Wilbur Beauchamp. In explanation of how concepts of the child may be broadened each year, the following statement was given:

We employ our body of elementary material to build units which are focused on major processes, activities or problems in biological and physical science. Such units may be elements of similar but broader units on a higher level. In high school the unit might be 'How do some kinds of animals take care of their babies?'  

Four methods of teaching elementary science are dis-

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cussed by David Russell in an article in the January, 1939, issue of Science Education. These are (1) the incidental method, (2) the definitely planned unit, (3) the subject core unit, and (4) the science concept unit. He said that although the incidental method depends solely upon the classroom teacher's personality and influence to guide and inspire the children, it has been used successfully, producing favorable outcomes, particularly in the primary grades. The planned unit extending over a period of several weeks or longer is a flexible one and has been used successfully by many.

The subject core unit is similar to the planned unit, except that any "subject," such as Social Studies, may be the core of the unit. The science concept unit, as its name implies, uses a science concept as the subject. The unit is not prescribed but is developed as the interests and abilities of the class as a whole and of individuals are indicated. According to the conclusions of a number of specialists who met in a science convention in 1939, "a method built around the concept-unit idea will meet with the approval of prevailing opinion and practice." 26

In The Forty-Sixth Yearbook of the National Society for the study of Education, the committee on science education made this statement:

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No instruction can be effectively carried out if based entirely upon daily happenings. If teaching is carried out entirely in this manner, it will be hit-and-miss and incomplete. In teaching, as in everything else, there must be planning, scope, and sequence. Opportunistic teaching is not to be commended. 27

This opinion seems to be directly opposed to that expressed in the suggested outline for Texas Public Schools which was prepared by Edgar Ellen Wilson for 1945, in which it is stated: "The teaching of science will be largely incidental and will result from the child's many experiences which increase his appreciation and understanding of everyday scientific facts." 28

As shown in his book, The Teaching of Nature Study and The Biological Sciences, Harrington Wells, Professor of Biological Science at Santa Barbara State College, Santa Barbara, California, apparently believes in systematic planning in the teaching of Nature Study. In the chapter on "Unit Development," he said:

Interweaving of activities, in the graded sequence advocated throughout this book, is facilitated through the following of a general plan during the formative primary-elementary period. Teachers, either by means of a course of study or mutual agreement, should formulate a general program to be followed during these school years. Rigid adherence to such an outline necessary.... However, such procedure allows for group planning and accomplishment upon a common basis. Organization along this line will bring about correlation of

lesser projects with larger units, and these in turn with greater principles as the child progresses through the grades from teacher to teacher, and from school to school.\textsuperscript{29}

Some aids to the teaching of Nature Study might be briefly discussed. Many mechanical toys and teaching devices now on the market were unheard of a few years ago. Herbert S. Zim in an article in the September, 1940, issue of *Childhood Education* said that a child has a positive reaction toward moving things, colorful objects, and materials that can be used for construction. In some instances science materials offer good outlets for these interests, as, for example, magnets, glass prisms, steam engines, and electric motors. He said that with radios, movies, airplanes, and automobiles, the child is constantly developing ideas and theories to explain the world about him and that his concepts on his level are as much science as are advanced experiments to a research worker.\textsuperscript{30}

The radio, unheard of until the autumn of 1920,\textsuperscript{31} has gone into practically every home and school. Many have phonograph attachments, which are useful in playing records in connection with Nature Study. Then, of course, there are other popular audio-visual aids which are particularly helpful in ex-

\textsuperscript{29} Harrington Wells, *The Teaching of Nature Study and The Biological Sciences*, p. 112.

\textsuperscript{30} Herbert S. Zim, "Science for the Six and Seven-Year Olds," *Childhood Education*, Vol. XVII. (September, 1940), 30-33.

\textsuperscript{31} Frederick Allen, *Only Yesterday*, p. 164.
plaining science. Many schools in Texas have at least one motion picture machine. Edward G. Olsen, in the book *School and Community*, stated, "Through motion pictures we can almost literally bring the world into the classroom. By using different types of photography...practically every form of physical phenomena and life activity may be realistically reproduced."32

Nature camps for children are not particularly new but are increasing rapidly in number and popularity. A discussion of nature education in camps was given in *The Nature Almanac* for 1927 by E. Laurence Palmer. In a survey made he found that nature counsellors in the camps were recruited largely from those with college training. The fields of science covered by camp nature activities were trees, flowers, birds, stars, insects, ferns, rocks, reptiles, mammals, topography, fish, weather, and microscopic life.33

School camps that run during the entire year seem to be comparatively new. Recently a number of articles have been published which tell of the establishment of school camps as a laboratory for school activities. In the spring of 1949 a five thousand acre campsite was bought and a camp was established in connection with the Jackson Park School at University City, Missouri, according to Betty Huffman, a teacher in that

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Lotene Willard, a former teacher-counselor of the Long Beach School System in California, wrote of the interest taken in the camp recently established by that system.

Some cities in Texas have established school camps that operate during the entire year. Those at Austin, Waco, and Tyler might be mentioned. According to an article in the May 1949 issue of The Texas Outlook, Camp Tyler is a very functional part of the school curriculum. Dr. George Donaldson, outstanding authority on outdoor education and former director of the Kellogg Foundation Camps in Battle Creek, Michigan, and now director of the Tyler camp, is ably assisted by well-trained assistant directors and counselors.

In Tyler children of the primary level are taken out for the day, whereas older children stay for a longer period. The counselor works in close connection with the teacher. She visits in the classroom and learns what the class is doing and offers suggestions. There is cooperative planning by the teacher. With primary children the main area of study is Nature Study. The counselor, who accompanies the group on all

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excursions, is of definite aid to the teacher. Well worked-out plans help to make these excursions effective. Olsen says, "The ideal school camp is one which carries on a full-time program throughout the calendar year."  

The following statement is taken from The Forty-Sixth Yearbook of The National Society for the Study of Education: 

There is a growing trend to develop natural science field centers. One school system in a southern state has a large tract of land which has been developed as a field center.... Field and educational consultants at different periods go with groups of teachers to the field center for the study of science and related subjects. This center is also suitable for work with children. Teachers can return to the field center with their own classes for several days during each school year.  

School camps in constant use and open throughout the year are comparatively new in Texas. Such camps should prove especially beneficial in the teaching of Nature Study to city children. Olsen says, "Camping introduces the child to the world beyond the city streets, to the world of Nature and to the world of personal work."  

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39 Olsen, op. cit., p. 228.
CHAPTER III

THE TRENDS OF CONTENT IN NATURE STUDY TEACHING

There is a close relationship between the methods of teaching Nature Study and the materials used in teaching. The continuous change of ideas concerning education and what should be the basis of curricula has had its influence on both content and method. Also, the amount of interest in Nature Study that has been exhibited over the country in various periods has had a decided bearing on the quantity and quality of materials used in the teaching.

In early American education Nature Study was taught incidentally, if at all, partly because there was little reading material available. As described in the preceding chapter, teachers' manuals, such as the one written by Mrs. L. L. Wilson, were often dry, unattractive and uninteresting.¹ The few books published, such as Special Method in Science, by Charles McMurry, in 1899, contained suggestions as to methods, but not many teachers had access to them. In McMurry's book a teacher was to "review the pupil's knowledge of the sun and moon from observation... Locate also any of the familiar constellations, as Orion." Again the nature of the material is shown in the types of questions to ask children. "Why can she climb so

¹Mrs. L. L. Wilson, Nature Study in Elementary Schools, p. 5.
easily?" is one question asked after the feet and claws of the house cat have been examined.\(^2\)

In his study *The Origins and Development of Elementary School Science*, Orra E. Underhill showed that this sort of manual was fast disappearing. In 191\(\text{1}\) he said that during the last ten or twenty years only two or three manuals were published in comparison to more than fifteen between the years 1900 and 1910.\(^3\)

According to Miss Cunningham's article, published in 1918, which has been referred to earlier in this study, the reading material in the geography and readers was not suited to the child nor was it of interest to him. Of that in geography she said, "It seems as if geography should begin in the school yard instead of far away China or some distant place." She continued, "There are a few books on the required lists of grammar schools today that deal with nature. In many schools books are read and re-read from year to year until the pupils often know the stories by heart.... These stories, too, are not the right sort to interest a child reader."\(^4\)

In an editorial entitled "Nature Study," which appeared in the March, 1929 issue of *The Elementary School Journal*, an explanation was given for the subsiding of the once enthusiastic


\(^4\)Esther Cunningham, *op. cit.*, 55-58.
nature-study movement. The leaders soon found out that most elementary teachers were without training and that the pupils were unable to assimilate the subject matter in the forms in which it was usually presented. This statement was made: "Today nature-study is again asking for admission to the elementary school curriculum." Resolutions were passed as to the need of more Nature Study in a meeting of The New York State Science Teachers' Association. It was proposed that surveys be made which would show "materials available in the environment of each school, ... for resourceful supervision, and for abundant materials supplied to teachers."^5

In an attempt to analyze the Nature Study material in some of the books in adoption in Texas between 1920 and 1950, the writer has examined and has made a careful study of Third Grade readers during this period. It is recognized that this analysis depends to some extent upon subjective judgments. The readers examined and discussed are the following:

In Adoption in 1920

The Art-Literature Reader, Book Three
The Child's World Third Reader
The Winston Reader, Book Three
Literature Reader for Grade Three
The Haliburton Third Reader

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In Adoption in 1930

The Child's World Third Reader
The Treasure Box
The Road of Health to Grown-up Town
The Story Reader, Book Three
Child Library Reader, Book Three

In Adoption in 1940

Near and Far-Unit Activity Reader
City Friends
The Land of Happy Days
Story Pictures of Our Neighbors
If I Were Going

In Adoption in 1950

Streets and Roads, Texas Edition
Adventures in Science With Jane and Paul
Our World of Science, Science Every Day
Basic Science Education Series
How Do We Know? Teacher's Edition
The Seasons Pass
Here and There With Henry - Enlarged
Texas Edition
Keeping Fit for Fun
Now and Then Stories

In Adoption in 1920

The Art-Literature Reader, Book Three,
by Frances E. Chutter

This reader is based on good literature, famous paintings, and famous people. A story or two concerning the life of each author is given, together with selections of his work. Famous paintings and also pictures of the artists and writers are included. The book is dedicated to Eugene Field and contains a section of his work. Many poems are included in every section of his work. Many poems are included in every section and most
of the nature material is in the form of poetry. There is one little story called "The Lazy Robin." There is very little nature material in the other stories.

**The Child's World Third Reader,**
by Sarah Withers and others

References to nature are found in myths and in some stories other than myths. There is one short story that is primarily a nature story, "A Story of Bird Life." It is illustrated with two colored pictures, one showing a pair of Baltimore orioles and the other their hanging nest swinging from a bough high in a maple tree. The book contains the story of flax, in which the flax is personified. Several poems are nature poems. "Who Told the News?" is about the coming of spring—how the birds told the flowers and others of its coming. "How the Flowers Grow," by Gabriel Setoun, teaches what its title suggests. It is a beautiful little poem and is seen in many collections of poems today.

**The Winston Reader, Book Three,**
by Sidney Firman and Ethel Maltby

This book contains many old fables, fairy tales and myths. There is little about nature within the stories, but more material is contained within some of the poems. "The Brown Thrush," by Lucy Larcom, gives a joyful note in these lines:

"Oh, the world's running over with joy! Don't you hear? Don't you see? Hush! Look! In my tree, I'm as happy as happy can be."
This poem, however, like most of the stories and a playlet entitled "The Larks in the Wheat," contains a moral for the child, as shown in the last verse:

"Oh, the world's running over with joy!
But long it won't be,
Don't you know? Can't you see?
Unless we are as good as can be!"

_Literature Reader for Grade Three_,
by Free and Treadwell

There are many poems, folk tales, fairy tales, and fables in this book. Many of the poems about nature are used to teach a moral lesson, such as "The Brown Thrush," by Lucy Larcom, and "How Doth the Little Busy Bee?" by Isaac Watts. "The Bluebird," by Mrs. Emily H. Miller, is a joyful poem that tells about the coming of spring, and the awakening of flowers. Other nature poems are "Ariel's Song," by William Shakespeare; "The Sea," by Matthew Arnold; "September," by Helen Hunt Jackson; "How the Leaves Came Down," by Suzan Hogg; "A Boy's Song," by James Hogg; "Calling the Violet," by Lucy Larcom; "The Wind," by Robert Louis Stevenson; and "Berrying Song," by Lucy Larcom. Any references to nature in the stories are incidental and interwoven with myth.

_The Halliburton Third Reader_,
by M. W. Halliburton

Almost the entire book is devoted to stories of other lands and to old tales of those lands. The reading material is difficult; there is very little nature material in the prose stories, and here it is in myth form. Nature is portrayed, however, in
a number of poems, many of which might be classified as strictly nature poems. Some of these are designated "for memorizing." Poems by Robert Louis Stevenson, Alfred Tennyson, and Lucy Larcom are included. There are no nature illustrations.

In Adoption in 1930

The Child's World Third Reader,
by Sarah Withers and others

This book was again in adoption in 1930. Besides the nature story mentioned and the nature poems, one little Indian legend, "The Trailing Arbutus," teaches a love for flowers and nature. It might be added that the bird story tells about bird habits, such as the care of birds for their babies and the migration of birds.

The Treasure Box,
by Mathilde C. Gecks and others

The major part of this book gives stories of other lands, stories for fun, old tales, and stories for holidays. Little nature material is contained in it. Some incidental references to nature are contained in the miscellaneous poems. A story section, entitled "Out-of-Doors," is essentially a nature study section. It includes two short squirrel stories, one fictional and one true-to-life; a story about a blue jay; one about beavers; one on stars; and several short stories about insects. They are very well illustrated. The section "Cotton and Wool" has some nature ideas but not as much as its name implies.
The Road of Health to Grown-up Town,
by Jessie Lummis and Williedell Shaw

There is no organized nature study in this health book, and the nature material in it is for the most part incidental. One true-to-life story tells of a little girl who waited too long to see the dentist. The children in the story make posters of foods that produce strong teeth. Health is taught through moral lessons given in many fictitious stories, such as "The Little Fox Who Didn't Like to Drink."

The Story Reader, Book Three,
by Sarah C. Bryant

Several of the stories in this reader are about camping trips, and others tell about the out-of-doors. The authors give good lessons in nature study as well as tell stories. "Ben Flicker's Mistake" gives the habits of the flicker, and there is a story about trout, one about deer, and another about maple sugar. A colored picture shows the flicker at work digging for grubs. The other stories have very little data on nature in them. Two poems might be classified as nature poems.

Child-Library Reader, Book Three,
by William Elson and Edna Kelly

This book is a collection of many kinds of stories and some poems. The nature material included is quite incidental in the fairy stories, the animal tales, and the tales from many lands. The stories and poems of the "Out-of-Doors" might be called a planned nature section. The story "The
Boy Who Hated Trees" teaches the usefulness of trees and has a strong appeal. "Johnny Bear and Other Winter Sleepers" tells in story form about the hibernation of animals. Another story gives the life cycle of the Tiger moth. One bird story and several nature poems are included. Very good pictures accompany the nature stories and poems.

In Adoption in 1940

Near and Far
by Nila Blanton Smith

Near and Far is divided into nine sections. Six of these include some nature data in the stories about boats, messages, Indians, deserts and foreign lands. The other three contain stories about the sun, moon, stars, weather, and insects. The science units are interesting, informative, and within the child's immediate observation. The few colored illustrations are small but good. This book is called a "Unit Activity Reader."

City Friends,
by Blanche Dearborn

This book contains a series of true-to-life stories. The story "At the Park" has more nature content than any other, although facts about nature are taught in "The Story of a Silk Dress" and "In the Cotton Field." Few illustrations are given. Nature is very incidental in several other stories, such as "The Trip to Mountain Park."
The Land of Happy Days,
by Dorothy Whaley and Charles Knudsen

The Land of Happy Days is a book of fairy stories. One's attention is attracted to the good illustrations, in color, of birds, frogs, butterflies, fish, seeds, vegetables, and many kinds of flowers. However, the nature in the stories is interspersed with the fairy element. For the most part, the book was not written for the nature content, although there are questions on one work page about seeds, roots, and other parts of vegetables.

Story Pictures of Our Neighbors,
by John Y. Beatty

This is not strictly a Nature Study book, but there is much nature content within the stories. The stories of wool, cotton, silk, and other products used in making our clothes have much nature content as do the stories of the zoo, electricity, lumbering, communication and transportation. Photographs are used to illustrate the stories.

If I Were Going,
by Mabel O'Donnell and Alice Carey

If I Were Going takes one on an imaginary trip to other countries. "It Happened in Norway" and "It Happened in Spain" are two typical sections. The book contains excellent stories that tell about deserts, mountainous countries, and cold countries. There is much of the adventure element in these stories, and the nature content is incidental. Through the adventures
one learns something about reindeer in Lapland, camels in the
desert, and goats in Switzerland. Pictures are included to
illustrate the story. Those included showing goats, reindeer
and camels would probably not be classified as strictly nature
pictures.

_In Adoption in 1950_

**Streets and Roads,**
by William S. Gray and
May Hill Arbuthnot

Some of the stories are true-to-life and tell about the
city and the country. For the most part, nature is incidental
in them although one short story, "John and the Robins," is a
nature story. A section called "Story Land" contains several
nature stories about a woodpecker, an owl, and a squirrel.
Another section may be called a Nature Study section. It has
eight good animal stories, which are well illustrated. These
are designed to promote interest in out-door life. Traits and
habits of raccoons, beavers, groundhogs and deer are brought
out in them. In the added Texas section some nature content is
found. The rest of the book is largely devoted to folk-tales,
fables, and old tales which contain little data on nature.

_Adventures in Science With Jane and Paul_,
by Harry A. Carpenter and others

This is one of the **Rainbow Series of Readers** in adoption
through the first eight grades. This is strictly a Nature Study
book. Fourteen science units are included, which are largely
seasonal. They are about plants, seeds, flowers, insects, birds and some animals. Stories in other units tell about weather-vanes, a compass, a saw-mill, and the making of maple sugar.

The stories are short, several covering only one page, but each related to the unit in which it is found. Many of the pictures are actual photographs taken by Guy A. Bailey, one of the authors. Pictures, such as the one of milkweed seeds being carried by the wind, are self-explanatory and make a child want to find these things in his natural environment. A picture, such as that of a feeding dish for hummingbirds, is suggestive of action, as is also the one showing how to make a compass. Colorful pictures of flowers, moths, and other insects provoke appreciation for beauty and stimulate interest in identifying, collecting, and furthering one's knowledge regarding them.

Science Every Day
by Wilbur Craig and Sarah Baldwin

Science Every Day is one of the series of Our World of Science, which is in adoption for grades One to Eight. This book encourages activity.

It increases children's eagerness to learn about the world about them and encourages them to do things. Suggestions are given for observation, excursions, simple experiments, and discussion. The book stresses the principal needs of animal life and how they are met, how animals are similar and how
they differ, and how they adapt themselves to their environment. One section, "Life-time of Plants," is beautifully illustrated with pictures of flowers, roots, seeds, and bulbs. Uses of electricity and how it works are discussed. The entire book is in large print, adapted to the maturity of the child, and illustrated with attractive pictures that are educative in themselves.

Basic Science Education Series,
by Glenn O. Blough and Bertha M. Parker

This series consists of a number of little nature books adopted for the primary grades and continuing through the Eighth Grade. The general plan is that a child's science concepts will enlarge as he progresses through them. It contains units on biological science and physical science.

Water Appears and Disappears, selected for the Third Grade, is a unit on weather. The core ideas gained are an understanding of evaporation, water vapor, dew, frost, clouds, and snow. How these are formed is explained as is the effect of heat and wind on the processes. Suggestions, with pictured illustrations of simple experiments that will help in the learning process, are given.

Animals Round the Year has stories about animals in autumn, animals in winter, and animals in spring and summer. It teaches how animals get ready for winter: some by growing thicker coats, some by storing food, some by hibernating. What becomes of insects and birds in winter is discussed.
Plants Round the Year, as its name implies, discloses what happens to plants during each season: how they get ready for winter, how food is stored, how things grow in the spring from seeds, roots and bulbs, and how plants make their food.

Birds in the Big Woods is another unit in biological science. Habits, food, nests and eggs of birds are disclosed in the stories. "Birds in Winter," "Birds That Help Us," and "Helping the Birds" are important smaller units.

The unit called Toys should interest every child. Simple experiments, with pictured illustrations, are given. Also, the work of electricity is explained in pictures of simple electrical toys.

Practically all the pages of these little books have large, beautiful illustrations in colors. The cover of each book is also attractively illustrated with a large picture. It has one central idea with very little background forming a simple picture which is appealing to the child. A teaching manual by Blough goes with The Basic Science Series.

How Do We Know?, Teacher's Edition, by Wilbur Beauchamp, Gertrude Crampton and William S. Gray

In the children's book How Do We Know?, four centers or areas of pupil interest are planned: animals, land and water forms, plants, and wheels and levers. Large pictures are given throughout the book that can explain more than the printed words. For example, pictures are used to explain how wheels make work easy and how levers make work easy.
These are suggestive of experimentation. A picture story is made of different ways of moving things. "How to Know Animals" has beautiful pictures and little games or puzzles to bring out the thought. The teacher's edition contains guidebook material bound with the pupil's text. How Do We Know is also one of a series called "Real Science in the Primary Grades" and a part of The Basic Science Program which extends through the first nine grades.

The Seasons Pass,
by George Willard Frazier and Others

This book is definitely planned as a science or nature study reader. The reading and experiments in each unit are designed to develop scientific concepts. It is beautifully illustrated with pictures of animals, animal homes, nests and flowers. Besides seasonal stories about plants and animals, there are also factual stories about weather, air, effects of weather, the stars, the moon, and what makes day and night. Pictures also are included to help explain simple experiments. The stories, with the accompanying illustrations, are such as to encourage a child to further observation, reading, and experimentation.

Here and There With Henry,
by James S. Tippett and Elise Wilkinson

This book contains true or true-to-life stories about a little boy and some of his good times. It includes a special section about a trip to Texas. On this trip, the little boy
Henry, learns something about the state and its history plus an appreciation of nature. He learns about the hills and the mountains, the state bird, and the state flower. There is a picture of the mockingbird and the bluebonnet. Most of the nature data in the book are brought out incidentally, although the stories "Spring" and "Edward's Birthday" may be considered nature lessons.

**Keeping Fit for Fun**,  
by Leslie W. Irwin and Others

Keeping Fit for Fun is essentially a health and safety book. For the most part the nature included is incidental. Two Stories, "The Animal Tent" and "Keeping Warm or Cool" probably contain more nature material than any others. No poetry is included. Several illustrations of animals, vegetables, and outdoor scenes accompany the various stories.

**Now and Then Stories**,  
by M. M. Ames and Odille Ousley

Much nature study is included in these stories of children of long ago and of today. "Winter is Coming" is the theme running through the section called "All Dressed Up." There are several stories about corn and one about making maple sugar. They are well illustrated. A number of picture stories throughout the book, each a page long, are very effective. One shows how electricity works for us; another tells the story of lightning; and a third is called "Keeping Warm."
The Wonderworld of Science Book Three
by Warren Knox and Others

It is small wonder that this book is rated very high. It is truly a "wonderworld of science," and it is one of a series for elementary grades. It contains interesting stories centered around Nature Study units. The book is well written and beautifully illustrated. It is in the language and comprehension of the child. In addition to beautiful colored pictures of flowers and animals, some drawings are used to illustrate important phenomena, as does one which gives the explanation of how the earth turns, causing day and night.

Such problems as (1) how do we get our food, (2) how do plants get their food, (3) where do plants store food, and (4) how do plants scatter seeds are included in the unit "Food Makers." Other units included are "The Changing Earth," "Heat of the Earth," "How Plants are Produced," and "Useful Plants." Making use of wind, water, heat, and electricity to do work is brought out. Riddles, questions, work pages, and suggestions of things to do are included in each unit. Among other topics studied are air, water, minerals, green plants, rocks, electricity, weather, machines, wind, flowers, seeds, bulbs, the earth, moon, sun, and stars.

Table I is a classification of nature study materials found in the third grade readers in adoption in the state of Texas from 1920 to 1950.
### TABLE I
CLASSIFICATION OF NATURE STUDY CONTENT
INCLUDED IN THE POEMS AND STORIES
OF THIRD GRADE READERS
1920-1950

<table>
<thead>
<tr>
<th>Names of Readers</th>
<th>Taught Incidentally</th>
<th>Taught as Planned Nature Study</th>
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<td></td>
<td>Number of Poems</td>
<td>Number of Factual Stories</td>
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<td>0</td>
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<td>1</td>
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<td>Haliburton Reader</td>
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<td>2</td>
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<tr>
<td>1930</td>
<td></td>
<td></td>
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<tr>
<td>Child's World</td>
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<td>The Treasure Box</td>
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<td>1</td>
</tr>
<tr>
<td>Child Library Reader</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>The Road of Health to Grown-up Town</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>The Story Reader</td>
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TABLE I - Continued

<table>
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<th>Names of Readers</th>
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<td>Number of Poems</td>
<td>Number of Factual Stories</td>
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<td>If I Were Going</td>
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<td>Near and Far</td>
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<td>The Land of Happy Days</td>
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<tr>
<td>Story Pictures of Our Neighbors</td>
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<td>11</td>
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<td>1950</td>
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<td>Streets and Roads</td>
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<td>Adventures in Science With Jane and Paul</td>
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</tr>
<tr>
<td>Science Every Day</td>
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<tr>
<td>The Seasons Pass</td>
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<td>0</td>
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<tr>
<td>Here and There With Henry</td>
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<td>Keeping Fit for Fun</td>
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<td>The Wonderworld of Science</td>
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<tr>
<td>Now and Then Stories</td>
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<td>13</td>
</tr>
<tr>
<td>Basic Science Stories</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
A study of Table I reveals that nature poems were popular in the 1920 period but the number steadily decreased until there were practically none in the 1950 period. In recreatory stories the materials on nature included in each period was largely incidental and there was a very sharp decrease of this type of material in the 1950 period. Practically no nature data were included in factual stories in the 1920 period. Each period shows an increase of nature material in the form of factual stories, with a sharp increase in the 1950 period. In conclusion, the Table shows a steady trend toward planned Nature Study. There is a decided trend toward the inclusion of nature in factual form as against recreational stories and poems.

A word of explanation is due about the readers in current adoption for the year 1950-51. The basal reader and several supplementary readers, including The Wonderworld of Science, are "carry-overs." The five other elementary science readers are included in a multiple-choice list. A certain number of books based on the enrollment can be selected for use in each classroom. Through the selection of a limited number of different books to be used in group work, a class or grade may have access to all the books listed for that grade. The law regarding the multiple list as set forth in Article 2843, and as amended in Senate Bill 37, Fifty-first Legislature, 1949, requires that the "State Board of Education shall adopt and select a multiple list of textbooks for the public free
schools of Texas," said list to consist of not fewer than three, and not more than five books on various subjects including elementary science.6

The committee which prepared the 1932 Yearbook of The National Society of Education on the teaching of science in the public schools strongly recommends a continuous science sequence through the elementary grades and high school. Concerning this procedure in the lower grades the following statement is made:

The science of the elementary school should be well-balanced and derived from the major fields of science. It should, however, not be organized or treated about the separate sciences, but rather about the problems and situations which are challenging, many of which may integrate the separate fields.7

This opinion is indorsed by the Society's Committee which prepared The Forty-Sixth Yearbook. Also, in regard to content this statement is made:

Craig discovered that the inquiries of children involved content from all of the major sciences.... Children's interests in the primary grades involve the physical sciences as well as the biological. From the physical sciences, simple but basic meanings can be secured about rocks, soil, sun, moon, stars, magnetism, static and current electricity, weather, air, water, light, sound and simple machines. From the biological sciences, there are meanings to be secured from such phenomena as the effect of seasonal change upon living things, animal


care of the young, conditions necessary to living things, and the economic value of plants and animals.

Somewhat the same idea relative to the nature of science content for the grades is expressed by Harrington Wells in these words:

The relation of environmental factors to biological forms is given increasing attention as the student advances through the grades. This may be termed the modern trend in elementary science teaching. Education along scientific lines is designed to aid the child in orienting himself to the world in which he finds himself. Mechanical and physical phenomena intermingle with the pulsing animate life he observes while going about his daily routine of work and play.

In an article in the September 1940 issue of Grade Teacher, Inez Lewis expressed her ideas as to nature content in the lower elementary school:

Nature study and Elementary Science should not be separated in the elementary school. There has been a tendency to put biological nature study in the primary grades and physical science in the upper grades. There is no valid professional study to warrant this practice. The difficulty of the subject-matter and vocabulary, and the interests of the children should determine the grade placement of the different units of General Science.

Again, Harrington Wells, in expressing his views about science books for children, in 1936 made this statement:

A particularly satisfying development resulting from recent studies has been the publishing of science readers, graded as to nature sequence. The use of this series of nature guides solves the problem of content regulation in the various classrooms while furnishing

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9Harrington Wells, The Teaching of Nature Study and The Biological Sciences, p. 90.

10Inez Lewis, "Elementary Science Curriculum," Grade Teacher Volume LVIII (Sept., 1940), 62.
teacher and student alike with authoritative information in this field. Vocabularies have been checked to insure the use of words within the understanding of the young people who will study them. They are written by leaders in the field of education.\(^{11}\)

Also, in regard to science material that had been published, Oorra Underhill stated in 1941: "The supplementary materials in the field of science have increased enormously during the past twenty-five years. The greater part of this reflects more or less the Nature Study point of view."\(^{12}\) May Hill Arbuthnot in 1947 made this statement concerning the quality of the science materials:

In no field has there been a greater improvement than in the science books for children. It is now possible to meet or encourage almost any scientific hobby a child may develop.... In science books no saccharine stories are needed to glamorize information which is in itself absorbingly interesting. Today, the wealth of good science books is worth our study.\(^{13}\)

In Eloise Rue's graded list of books, in her *Subject Index to Books for Primary Grades*, compiled in 1943, science books by Wilbur Beauchamp, Gerald Craig, George Frasier and others are rated high.\(^{14}\) Of *The Wonderworld of Science*, by Warren Knox and others, Edna Johnson, in her *Anthology of*

\(^{11}\)Wells, op. cit., p. 89.

\(^{12}\)Underhill, op. cit., p. 221.

\(^{13}\)May Hill Arbuthnot, *Children and Books*, p. 509.

\(^{14}\)Eloise Rue, *Subject Index to Books for Primary Grades*, pp. 9 - 35.
Children's Literature, makes this note: "Excellent stories with large type and attractive illustrations." She also includes Science Every Day by Gerald Craig in her list of good books.15

Reading specialists and authorities in the field of science are combining their efforts in the writing of books for children. For example, Gerald S. Craig, a science specialist, and Sarah E. Baldwin, a reading specialist, are co-authors of Science Every Day, one of the series The World of Science. It appears that the authors of The Wonderworld of Science--Warren Knox, George Stone, Morris Meister and Doris Noble--were right when they stated:

The content was carefully checked with curriculum materials proposed in various State Syllabuses and in such reports as the 31st Yearbook of the National Society for the Study of Education. The rich and comprehensive content represents the contribution of research in elementary school science and of a long experience with a nature study program in American elementary schools.16

Probably other books, such as Craig's, would measure up equally well in nature content to that outlined in The Thirty-First and The Forty-Sixth Yearbooks of The National Society for the Study of Education. Besides the books for children, teachers are deluged with additional material. A manual or guide is sent with each reader; posters and charts are sent

with many. For example, in connection with *The How and Why Series*, which contains *The Seasons Pass*, a huge chart has been printed which shows "the development of science concepts from pre-primer through book eight." A similar chart is printed in connection with *The Basic Studies in Science Program* of which *How Do We Know* is for grade three. Thus, we have progressed a long way from the incidental or hit-or-miss method of an earlier period to the well organized, planned *Nature Study and Science of today*. 
CHAPTER IV

SUMMARY AND CONCLUSION

Summary

The findings of this study indicate that in the first part of this century nature was taught incidentally by the teacher. There was no reading material for the child except references in a few stories and poems. The tendency was to glamorize nature. The 1915 course of study in Texas directed that nature should be taught under the guidance of the teacher and in connection with geography in the Third Grade. It contained suggestions for observation practices by the pupils. In the nineteen-twenties the incidental method was continued, but the use of dry manuals and geographies plus, in many cases, the inadequate preparation of teachers caused the subject to become unpopular.

By 1930 interest was reviving. Manuals were decreasing in number, and the method of "pouring-in" was outmoded. The idea was growing that teachers should have better preparation and should depend more on recognized authorities in the field. Fewer poems and more factual stories about nature were placed in the state-adopted books, and these on the whole were more on the child's level and better illustrated than in the past. The unit and subject core methods became popular, and a correlation with other subjects as well as attempts to teach nature in relationship to everyday life was a definite trend. In the
1940 adopted texts there were still more nature stories, and regular Nature Study books were published. There was a growing tendency to integrate nature with other subjects in many schools. The trend was away from entertaining stories toward organized, accurate, elementary science information. A trend was shown toward material that will help the child adjust toward his environment. There was also a trend toward the development of a regular science program, this program being further promoted in Texas by the multiple-choice text-book law of 1949 and the adoption in 1950 of six elementary science books.

Conclusion

At the present time, the science concept is dominant. Plenty of interesting, well-illustrated reading material by specialists is available for both pupil and teachers. The new science books, the emphasis on year-round nature camps, the well directed field trips, the wealth of audio-visual aids, especially the radio, motion pictures, slides and slidefilms, make it probable that nature study will have a very important part in the curricula of elementary schools in Texas in the future. In these developments Texas compares favorably with the trends of Nature Study teaching as outlined by authorities in the books discussed and as practiced throughout the country according to articles read. Living in an age of thinking and doing, boys and girls, from early childhood, should have a well developed, interesting, constructive, authentic program
for learning about their environment and for learning to adapt themselves in the best possible manner to harmonious living in their own communities.
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**Articles**


