

A RADIO PROJECT FOR THE PRIMARY LEVEL
BASED ON PRIMARY STUDIES IN SCIENCE AND
INTEGRATED WITH NATURE MYTHS

A THESIS

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We hereby recommend that the thesis prepared under our supervision by VIVIAN BEATRICE BURCH

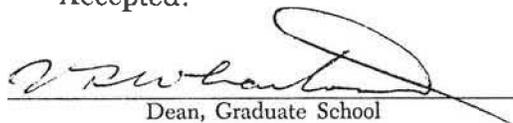
entitled A RADIO PROJECT FOR THE PRIMARY LEVEL
BASED ON PRIMARY STUDIES IN SCIENCE AND
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be accepted as fulfilling this part of the requirements for the Degree of Master of Arts.

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PREFACE

The writer is indebted to numerous persons over the years since 1947 for the ideas and materials of this thesis. Some of these deserve special mention.

Acknowledgment is particularly due the following persons for their individual contributions: James and Elizabeth Burch, the writer's family, for their faith in the project; Earl C. Bryan, Director of the Speech Department, for his sympathetic attitude toward the project; the thesis committee, Josh P. Roach and E. Robert Black of the Speech Department and Dr. Ivan L. Schulze of the College Library for their cooperation and sound advice in the work of dispatching the final assimilation of the material during the past weeks; and the children of the 1952-1953 Primary classes of St. John's Parish Day School in Tampa, Florida for the composite personalities, actions and reactions of the "script children."

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CHAPTER I
INTRODUCTION

Radio as a classroom supplement to teaching is now an accepted fact in the world of education. The schools have been utilizing radio as a teaching medium since 1922. A Federal Writers project publication reports the building of a complete radio station by the students of a vocational school in that year at Buffalo, New York.¹ The students broadcast their own programs from the city's schools. Since 1930, when the National Advisory Council on Radio in Education was organized, various national committees have been set up to stimulate interest in radio and to promote and improve its educational value as an auditory aid to teaching. In more recent years entire periodicals, such as the Journal of the Association for Education by Radio, have been devoted to this promotion, and an increasing number of articles are appearing in periodicals designed for more general aspects of education. With the founding of a Radio Division in the United States Office of Education, radio received its official stamp of approval in the schools of the nation.

¹Radio in Education (Harrisburg, Pennsylvania: Department of Public Instruction, 1939), pp. 5-6.

In the larger school systems and in many of the smaller ones educational radio programs of one type or another are an integral part of teaching today. The smaller systems may utilize the programs of commercial radio in various ways. They may plan radio units of study in speech for skills with such programs as models and source material; they may audit such programs for specific course content; or they may plan a unit of study of their own in unison with such a program. The Columbia Broadcasting System's American School of the Air and the National Broadcasting Company's Standard Broadcast of the Pacific coast chain have been the source of many educationally sound programs both for in-school and out-of-school listening. The larger schools have programs designed as a part of the school curriculum, such as those of the city school systems of Chicago, Cleveland, and Rochester. Both commercial stations and college operated stations now regularly broadcast schools-of-the-air covering almost every phase of the school curriculum. Literature, language, music, health, social studies, and science have all been supplemented and illustrated by radio. Various phases of these fields have been covered in radio, as well as integrations of the subject areas. In science, nature study - the basic area of the Project of this thesis - has been a favorite topic for educational broadcasts on the elementary level. Both the Rochester School of the Air and

the Chicago Public Schools have sponsored excellent science series. And the successful Wisconsin School of the Air's nature series "Afield with Ranger Mac" has been much publicized, serving often as a model for similar programs by other schools-of-the-air.

The present work is the result of an interest aroused in 1947 through script writing done as a class project for the Texas School of the Air. The specific form in which it is here presented is the result of an application of the basic idea in classroom practice with a combined second and third grade at St. John's Parish Day School in Tampa, Florida during the 1952-53 school year. This basic idea - the integration of "general science" with literature - underwent various adaptations in its use as a classroom project. The most significant of these was the manner in which the basic primary skills of the language arts were incorporated into the activity. This will be more fully noted and exemplified when the plan is presented and the procedure for using it is given in the programs themselves.

No other work of this exact nature in the graduate field has come to the attention of the writer during research and work on the project. However, near its completion, she found a publication of particular interest in the Library of the Texas State College for Women, Denton, Texas. This was a multigraphed pamphlet of Radio Theses done in American

colleges and universities from 1918 to 1950.¹ Not all of the institutions contacted responded to the request for information, so the reference work is of course not a complete picture of the situation. However, a careful study of available data reveals no work of an exact nature to have been reported. Those touching phases of it, and having most in common with it, are presented below for the value they may have toward determining the timeliness and usefulness of the present work. The major field of the author appears in parenthesis, and the page number following refers to the source.

Radio Theses Written in American Colleges
and Universities (1918-1950) in the Field
of this Thesis - (Selected)

- 1931, The Use of Radio in the Elementary School. Sister M. Adelgunde, M. A., Catholic University of America. (Education) page 10.
- 1933, Experiments in Education by Radio. William F. Livingston, Ph. M., University of Wisconsin. (Education) page 14.
- 1938, A Radio Adaptation and Production Manual of Stories from The Arabian Nights. Harry Goldstein, M. A., Wayne University. (Speech) page 38.
- 1939, Use of Radio Programs in Elementary Education. Grace C. Pomeroy, M. Ed., University of Buffalo. (Education) page 16.
- 1940, The Preparation, Presentation and Following Activities of Radio in the Classroom. Eugenia Paprin, M. A., Michigan State College. (Speech) page 42.

¹Raymond D. Cheydleur, A Compilation of Radio Theses in American Colleges and Universities, 1918-1950. Huntington, West Virginia, Marshall College, 1950. passim.

- 1942, Radio--Its Technique in the Elementary Classroom. E. P. Bartlet, M. Ed., Boston University. (Education) page 9.
- 1947, Guiding Principles for the Construction of Children's Radio Programs, With Scripts in Five Program Patterns. Marianne Kennedy, M. A., University of Denver. (Speech) page 40.
- 1948, A Series of Original Radio Scripts Based on Folklore Materials. Herbert Nathan Kanzell, M. A., Iowa.* (Speech) page 40.
- 1948, An Instructional Materials Program for a Small School System. John Gustaf Gasser, M. A., Washington.* (Education) page 12.
- 1948, The Preparation, Production, and Evaluation of a Series of Instrumental Appreciation Broadcasts for the Elementary Grades. James Robert Boyle, M. A., Indiana State Teachers. (Speech) page 34.
- 1949, A Proposed Plan for Use of Radio in Education in the Primary Schools of Louisiana. Alma T. Caldwell, M. A., Louisiana State University. (Speech) page 35.
- 1949, An Experimental Study Concerning the Effectiveness of Certain Audio-Visual Materials With Selected Third Grade Groups in the Oklahoma City Public Schools. Nyanzie Ruff, M. Ed., Oklahoma.* (Education) page 17.
- 1949, Preparation and Presentation of a Specialized Series of Children's Radio Programs Based on Folk Tales. Edward Nicholas Hallack, M. A., University of Southern California. (Radio) page 31.

* Institutional reference ambiguous in source.

Though it is not possible to be sure without examining the theses themselves, it does not appear that any one of these combines science and literature for the primary level, or that a specific course of study is the basis for the work. When the area of subject matter was not evident from the title, if the major field of the author indicated a kinship with this thesis, his work was included in this selected listing. The field of legend and folklore, which

is the linking element of science and literature in this Project, was twice represented in the compilation.

Three features which distinguish this thesis from any of the above, or from any other work of this general nature known to the writer, are: (1) it is a program of primary instruction combining natural science with literature; (2) it is based on a specific course of basic science study; and (3) it was developed under "laboratory" conditions, in the classroom, by the children as much as by the teacher.

Before presenting the plan of the work and setting forth the procedure, it would be well to consider the educational aims and objectives underlying it as a program of primary instruction.

The general aim might be said to be that of all education for children: to teach the child what he needs to know in accordance with the laws of learning as these have been revealed by educational research. The teacher's task in achieving this aim is first, to provide (a) correct initial techniques and practices for the acquisition of basic skills and habits, (b) opportunities to grasp and practice behavior patterns necessary to the acquisition of competent social adjustment; and (c) a wide variety of examples and experiences necessary to the acquisition of a generalized picture (i. e., abstract thinking process) in the area of

learning knowledge is being guided; next, consider (a) fatigue and physiological unreadiness on the part of the child, (b) practice by drill in a skills-acquisition only when "a" above is favorable to this technique, and (c) that emotionally satisfying experiences are conducive to optimum learning but that they are not absolutely necessary to achieve learning per se.¹

Pinpointing the educational aims underlying the project from the general to the elementary level of instruction, the teacher should remember that the "newer" educational practices advocate the following techniques: to take account of children's interests and concerns; to provide opportunity for initiative and enterprise; to promote problem-solving as distinguished from rote learning; and to provide a functional, integrated approach accompanied by a wide range of activities and projects.²

Bringing aims and objectives from those for the entire elementary curriculum to a specific area of it, nature study, these general purposes are applicable: (1) to develop an alert sense of esthetic appreciation of

¹Condensed from a discussion by Charles E. Skinner, Elementary Educational Psychology (New York: Prentice-Hall, Inc., 1945), pp. 164-166.

²Condensed from Arthur T. Jersild et al, Child Development and the Curriculum (New York: Bureau of Publications, Teachers College, Columbia University, 1946), p. 157.

nature; to increase knowledge of how nature has governed the activities of man; to aid pupils to understand and to use scientific methods in making decisions; and to stimulate a desirable attitude toward the preservation of natural resources.¹

These general aims and objectives are believed to have all been met in the plan of this Project and to be inherent in the practices set forth in the directed procedures for putting it into operation. The actual achievement of them in practice will of course be that responsibility of the individual teacher who may use the program.

The direct objectives of A Radio Project for the Primary Level as it is developed by the thirty-six programs of this thesis are: (1) to supplement the work of the classroom teacher in the science series on which it is based, (2) to motivate classroom activities in this series, (3) to create interest in and enthusiasm for the course, (4) to unify the primary program of basic science, (5) to integrate this "subject" with literature, (6) to tie as many primary basic skills of the language arts into the activity as is practicable, and (7) to develop auditory learning.

The underlying principle of the Project is that the

¹Adapted from objectives for teaching nature study by radio of various programs, Roy DeVerl Wiley and Helen Ann Young, Radio in Elementary Education (Boston: D. C. Heath and Company, 1948), p. 302.

scientific facts learned by the children during the week in the regular classroom work are supplemented by facts of a unifying and widening nature and paralleled with nature myths accounting for these facts by the peoples of antiquity. A person known to the children as "the General" contributes the factual science material of the scripts. His niece, called "Molly Myth" by the children, contributes the legendary tales. Three children, one of each primary age level, serve as proxy participants for the listening children. They ask and answer questions that tie the weekly programs to the classroom work. In the series of thirty-six programs, timed to the normal thirty-six weeks instructional period of the school year, these five characters assimilate the science concepts learned during the week in the classroom. The atmosphere is that of a weekly visit, organized as a "Science Club of the Air." The circumstances under which this comes about is narrated in the opening script which presents the frame-work of the series. The final script is devoted to rounding out the year's work. The intervening programs are equally divided between the four units of study in the texts to which the Project is keyed.

These texts comprise the Basic Studies in Science course in the Curriculum Foundation Series of the Scott, Foresman and Company, Chicago school text publishers. The primary science series is written by Wilbur L. Beauchamp

and Gertrude Crampton, with William S. Gray as reading director. The texts are: Primary I, Look and Learn, (1950) Primary II, All Around Us (1951), and Primary III, How Do We Know? (1947). These books will be referred to throughout the thesis by title only. Each program is preceded by the necessary information for scheduling the series to these texts.

The program material is presented in two forms: radio scripts and content summary. Programs appearing in radio script form are: No. 1, introducing the series; No. 2, as an illustration of a unit-introducing script; No. 9, as an illustration of a unit-concluding script; No. 14, exemplifying a typical program of the unit on Energy; No. 23, exemplifying a typical program of the Unit on Earth's Surface and Weather; No. 32, exemplifying a typical program of the unit on Plants; and No. 36, concluding the series. The intervening programs are given in content summary form.

The three methods under which the Project may be put into operation are:

I. Using scripts as a guiding outline for a creative dramatics activity by individual schools in weekly Primary Assembly Programs (or the exact script for simulated radio broadcast).

II. Permanent recording of scripts for distribution to school systems using the series on which the Project is

based for weekly audio-activity in Primary Assembly.

III. Recorded or "live" broadcast of the scripts by city or state boards of education as a school-of-the-air activity incorporated into the curriculum.

The value of the project as an enrichment activity for the science series on which it is based lies mainly in the realm of coordinating the three levels of the Primary Group. From this coordination, Primary I should gain a wider view of the field of science without the necessity of retaining this extended information at a time when the span of attention and the powers of retention are so short. Primary II should receive this same value in respect to the material of the next higher level, with the additional value of review from the concepts of the lower level. And Primary III should receive a comprehensive review through incorporation of concepts from the two lower levels while obtaining an overview of the entire primary science series. This latter would seem to be of particular importance in the realm of generalizations leading to abstract thinking.

A liberty has been taken in the matter of footnoting the radio scripts and the content summaries of programs. These have been handled in the manner for tables and graphs. This seemed advisable partly in order to present the material in a practical manner for putting the Project into operation and partly from the fact that a radio script has mechanical

requirements that do not present a neat appearance on the page when footnoted. Perhaps it should also be mentioned here that the Bibliography of the thesis does not contain those books listed in the Teacher's Reference section of the programs unless they were also used in the actual composition of the thesis proper.

A final word of warning is felt to be necessary in regard to the materials of the scripts. Should the Project be put into use over a licensed radio station, all materials in the scripts must first be cleared with the copyright holders as acknowledged by source reference in this thesis.

Presentation of the program material is divided into four sections of nine programs each in the following four chapters by science unit organization: Chapter II, Animals; Chapter III, Energy; Chapter IV, Earth's Surface and Weather; and Chapter V, Plants.

CHAPTER II

PROGRAMS COVERING THE FIRST SCIENCE UNIT

The first nine programs are keyed to the first unit of study in the texts of the three primary levels. The science concepts, and the unit name, are quoted from the teacher's guidebooks of these texts for their value as an overview of the material in the programs.

"Unit 1, Animals, (Primary I)

- A. There are many kinds of animals.
- B. Animals live in various environments.
- C. Animals carry on activities to keep alive.
- D. Man uses animals for various purposes."¹

"Unit 1, Animals, (Primary II)

- A. Animals may be classified into groups according to their general physical characteristics.
- B. Animals follow a definite pattern of growth.
- C. Animals must have food to live and grow.
- D. Baby animals receive varying degrees of parental care and protection."²

"Unit 1, Animals, (Primary III)

- A. Animals are classified into groups on the basis of their general physical characteristics.
- B. Species of animals within a group have distinguishing characteristics.
- C. Animals have structures that enable them to get food in various types of habitats.

¹Wilbur L. Beauchamp, et al., Guidebook for Look and Learn (Chicago: Scott, Foresman and Company, 1950), p. 8.

²Wilbur L. Beauchamp, et al., Guidebook for All Around Us (Chicago: Scott, Foresman and Company, 1951), p. 8.

- D. Animals have food-getting structures that are classified as primary or secondary according to use.
- E. Food-getting structures are related to the types of food eaten.
- F. Animal population is related to the available food supply.
- G. Wild-animal life can be conserved by man."¹

Radio Script for Program No. 1.

The program is designed to be presented very near the time when the children have first received their books, had an introduction to them from the teacher, and made an exploratory examination of the texts for themselves. Its primary purpose is to set the pattern of the broadcasts for the year. The characters of the series are introduced and identified, their function in the programs explained, and the procedure for the weekly activity is established.

The scientific material contained in this first script is only secondary. The actual paralleling of the material to the texts begins with the second program. However, by a comparison with the basic concepts of the three participating levels quoted above, it will be noted that some concepts are touched upon and forecast for the next program.

The usual procedure for using radio as an in-school listening aid is a three-step process: (1) preparation,

¹Wilbur L. Beauchamp, et al., Guidebook for How Do We Know? (Chicago: Scott, Foresman and Company, 1947), p. 9. Reference to this, and the two preceding sources, will be made hereafter by title only.

(2) participation, and (3) follow-up. No interested, resourceful teacher is going to follow every detail of the lesson plans for a given activity of her teaching. Therefore, only general suggestions are noted for these three phases of teacher-planning for this Project. The preparation phase will depend greatly upon the needs and interests of the pupils. But these general suggestions may be helpful for maximum learning from this first program.

1. If the children are not all familiar with a radio broadcasting studio, arrange to take them to visit the local station to watch a "live" program in progress on the air. Then prepare them for the "science club of the air" in a manner that will not reveal the plot of the script. If their interest is sufficiently high at this point, help them organize their own "chapter" before the first program.

2. If possible, have some real bluebird and bluejay feathers on hand before the broadcast. The bluejay tail feather is of most importance. If this is not possible, try to have a large color-picture of these two birds to put up during the broadcast in a place easily seen.

3. Take the opportunity during reading periods in the week before the broadcast to determine the individual attitude of the pupils toward "make-believe" and "real" stories. If the response seems to demand it, a story time might be devoted to showing the children how peoples of

antiquity were, in relation to scientific facts as we know them today, history's "children." The fact that many races widely separated in time and space conceived various but similar stories in their efforts to answer their own questionings about the phenomena of the world about them and the creatures it contained can be used here. A comparison between the questions of prehistoric man and their own curiosity about nature might even be included. There is hardly a more opportune time to instill in the minds of children the true purpose of nature myths while retaining their literary value than that of early childhood. This fact should be kept in mind: children are naive and inexperienced, but they are not gullible. The fine line between playing upon a child's inexperience and stimulating his imagination should not be crossed. The difference is ethical, and the values of scientific fact in relation to the literary value of myths and legends should be considered. Over-explanation is a danger here, too. As Mila Mac, late writer-director-producer of the prize-winning radio show for children, Let's Pretend, once remarked, children are no different than grown-ups except that most of them are brighter than most adults! A good description of a myth which may serve to illustrate the tone and quality desirable in retelling legendary material to children is that given in the introduction to a reference work on the subject:

"Myth may best be described as the gossamer cloak of folk memory overlaying the bare bones of pre-history. ... primitive man in telling these stories was not guilty of deliberate misrepresentation but rather that owing to his inability to perceive the relationship between cause and effect, or to distinguish between fact and prejudice, we are presented in them a series of glimpses of history as seen through the eyes of children."¹

This quotation and the preceding remarks concerning the teacher's own idea of and attitude toward nature myths and legends is of particular importance in using the references given under Teachers References following each radio script. These references are to documented facts, for the most part. Rarely are they to specific tales already in a form suitable for direct reading to primary children. Often the teacher will find that she must compose adaptations from the material. This is the procedure followed for most of the stories of "Molly Myth" in the scripts presented in this thesis.

Some of the ideas in the above suggestions for preparatory steps may carry over into participation activities with some groups. If this should be the case, the classroom teacher will make her own plans for carrying out such participating activities. However, the first program is designed basically for introductory listening without active participation on the part of the group.

A Teacher's Reference section follows this, and all

¹Egerton Sykes, compiler, and author of the Introduction, Everyman's Dictionary of Non-Classical Mythology (New York: E. P. Dutton and Company, Inc., 1952), p. ix.

other programs presented in radio script form. Follow-up suggestions are included in this section.

(MUSIC: THEME ... OPEN FULL AND FADE BEHIND)

GRETCHEN: "Hi," there! Has your teacher told you about the Science Club of the Air? I guess she must have, or you wouldn't be listening to me now. My name is Gretchen. I'm in Primary III at school. I know that you are in Primary class too, because that's who our Club members are - boys and girls who are studying Primary Science. Oh me! I'm doing just what our grown-up friends teach us not to do - doing all of the talking instead of sharing that right with others. And Jimmy's face is telling me so, too. I'm club president of our chapter, so I guess I did have the right to speak first. But Jimmy is club secretary, so he wants to talk to you, too.

JIMMY: Yes I do, Gretchen. I want to tell them how our club started, and I want them to meet Buddy, too. He's in Primary I and I'm in Primary II.

BUDDY: (Petulantly) I could tell them what class I'm in Jimmy, just as you and Gretchen told them what class you are in.

GRETCHEN: That's right, Buddy. Jimmy and I both forgot

(MORE)

our "sharing" lesson, didn't we.

BUDDY: Yes, but I'm going to tell them something else about myself! (Quickly) I'm club Vice-President. And if Gretchen isn't here sometime, I get to be president!

JIMMY: That's right, Buddy, you do. But don't you think we had better let Gretchen tell them what we did last summer that made us want to have a Science Club?

BUDDY: (Excitedly) Yes, yes! Tell them, Gretchen.

GRETCHEN: All right. You see, I live in the country, and there is a lake and a woods practically right at my front door. Jimmy and Buddy live in town. So - last summer, after school was out, they came out to visit me. One day we were "science hunting," as we called it. That is, we were out in the woods looking as hard as we could for things we learned about in school last year.

BUDDY: I wasn't in school last year.

JIMMY: But you are now, Buddy. Go on Gretchen, tell them what happened to us in the woods.

GRETCHEN: Well, we were walking through the woods, and we saw a beautiful blue bird. Buddy called it a bluebird, but Jimmy said it was not a bluebird, and they were arguing about it awfully loud, when suddenly -- (BEGIN FADE ... SOUND, IN UNDER OF "WOODSY NOISES" DIMLY IN BACKGROUND) -- we

heard a BIG, DEEP voice -- (COMPLETE FADE).

GENERAL: (FADE IN) Goodness gracious sakes alive! You boys are making as much noise about that bird as he usually makes by himself! And there's really no need of it, because you are both right. It is a "blue" bird, just as this boy's eyes tell him. "What's your name, little "sharp-eyes?"

BUDDY: Buddy.

JIMMY: And I'm Jimmy.

GRETCHEN: My name's Gretchen.

BUDDY: What's your name?

GENERAL: (Chuckling) Well, the folks around here call me "the General," though that's what I used to be, not what I am now.

JIMMY: (Excitedly) A real general? In a real army?

GENERAL: Yes, that's right. But now I spend most of my time doing just what you seem to be doing this afternoon - roaming the woods to see what I can find. There are many things all around us in nature to look as if we'll just open our eyes, and learn from nature.

GRETCHEN: My goodness, you just named the science books I had in school!

GENERAL: I did?

GRETCHEN: Yes, The one I had in Primary I was called Look

and Learn and the one I had in Primary II, last year, was All Around Us. Next year my science book is going to be the one called How Do We Know?

GENERAL: Hmm. A very good name for a science book. Most of us spend our lives searching for thing that will tell us how we know, or why we believe something. Just now, when I heard you boys arguing so loudly, I was doing that very things with this feather I picked up. I think I know what bird it belonged to.

JIMMY: May I see it?

GRETCHEN: Let me look at it, too.

BUDDY: Me, too.

GENERAL: Good. Gather round now, and we'll all decide together how we know what bird lost this feather.

GRETCHEN: It's a blue feather, so it must ---

BUDDY: --- belong to a blue bird - like the one Jimmy said wasn't a bluebird!

JIMMY: It does belong to a bird like the one we saw, Buddy, but it wasn't jus-ta "blue" bird, it ---

BUDDY: It was too! It was blue and (rapidly) birds that are blue are blue birds!

GENERAL: Here you go again, boys! Stop arguing and look, and listen. The feather is blue, therefore the bird it belonged to was a "blue" bird, that is, in the same way that a car painted red is a "red"

car, whether it's a Buick or a Ford. In that much, you are right, Buddy. But look at this feather more closely. It's a special shade of blue, a sort of blue-green, ---

GRETCHEN: --- with a little black line across it near the end. And it's a long, slim feather - the tail feather of a bluejay!

JIMMY: Yes! And Buddy just wouldn't keep still long enough for me to tell him how I knew it wasn't just a "blue" bird we saw.

BUDDY: It was too, blue! The General just said ---

GENERAL: --- that it was a blue bird. But not the bird whose name is "bluebird," Buddy.

BUDDY: Oh!

GRETCHEN: Bluebirds, that is, the kind named "bluebirds," are much smaller than bluejays, Buddy.

JIMMY: Yes. And a bluebird has sort of yellowish-brown breast feathers ---

BUDDY: (QUICK CUT IN) The one we saw had gray feathers on his breast.

GENERAL: Good, Buddy. What else do you remember about it?

BUDDY: Well, it had a sort of a "top-knot" on its head, and --- and a "black necklace."

GENERAL: Right! A bluejay has a black ring of feathers around its throat that does look like a necklace"

(MORE)

and its head feathers do come to a peak.

MOLLY: (FADE IN) And do you know why the bluejay is so quarrelsome-ly noisy?

GENERAL: Ah, Molly! Did you get worried, and come to look for me? Children, this is my niece, Molly. Molly, this is Gretchen, Jimmy, and Buddy.

MOLLY: Hello.

CHILDREN: Hello.

BUDDY: Why is the bluejay kw-kwar--uh, what you said?

GRETCHEN: Quar-rel-some-ly noisy, Buddy. That means make a lot of noise, like you and Jimmy were doing when the General came up.

JIMMY: A bluejay does make "fussy" sounds. Why?

MOLLY: Well - you see, he wasn't always a bird.

BUDDY: He wasn't?

JIMMY: Awh - he was, too! Baby bluejays are hatched from eggs that mother bluejays lay!

GRETCHEN: Yes, Jimmy. But I think I know what Molly means. There's a make-believe story about the bluejay once being something else.

GENERAL: I'm sure you are right, Gretchen. Molly knows more make-believe stories about animals and plants and the earth than I do real ones.

BUDDY: Tell us the make-believe story - pl-ease!

MOLLY: Let's get comfortable, first.

ALL: (MINGLING OF VOICES AND "SETTLING" SOUNDS)
 All right. Let's sit over here. The grass is soft, and green. Sit by me, General. Sure thing, Jimmy. Please sit by me, Molly. Very well. You sit on the other side of me, Buddy.

MOLLY: (VOICE EMERGING CLEAR FROM ABOVE) Now -- are we all settled?

CHORUS: Yes, yes -- let's begin!

MOLLY: All right. (PAUSE) Once, l-o-n-g ago, in the land of the Chinook Indians, there lived a little boy whose name was Bluejay.² He was very fond of playing tricks on all the other little Indian boys and girls, and he just never did his chores. Most of the time his sister Ioi (Ī ō ē) had to do her own and her brother's chores. And Bluejay grew up to be the same sort of young man, too. When their parents were no longer with them, Ioi still had to do all the work. She grew very tired of working so hard. One day, when she had worked especially hard, she said to Bluejay, "Please, brother, go and find yourself a wife. Go to all the tribes until you have found one. Then there will be soemone to help me with the work." Now Bluejay hadn't thought of such a thing before, but it

(MORE)

sounded like it might be a good chance to go off on an adventure. So, he set out to look for a wife. He traveled from tribe to tribe. But every family to whom he went refused him a wife. The chief of the tribe would say, "No! Our daughters are not for you! You are the boy who plays all the time. You would not make a good husband for our daughters." At first, Bluejay didn't mind this one bit, for he didn't really care whether he found a wife or not. But finally, he grew tired of traveling, and he began to be angry when a family refused him a wife. At last he came to a land he had never seen before. It was the strangest place! Everyone was so q-u-i-e-t, and still. They all seemed to be sleeping with their eyes open! As he walked through their town, he saw a very beautiful young girl. As soon as he saw her he thought, "There's the girl I want for my wife!" But she would not answer him when he spoke to her. Nor would any of the people around her! Then - Bluejay remembered something. "This must be the land of the Supernatural people," he said. "Grandfather told us about it when I was a little boy." Of course! Everyone here was asleep. And

(MORE)

the only way any of them could be awakened was to get them out of the land without the Chief knowing it. As soon as he remembered this, Bluejay picked up the young girl and raced away with her. He could run as fast as the wind. And in no time at all he was back home. When Ioe saw her brother's bride, she was very happy. That is, she was happy until she realized whom her brother had brought back for a wife! She remembered their Grandfather's stories, too - and only one person in all the land of the Chinooks could possibly be this beautiful. "Oh, Bluejay!" she cried, "you have stolen the daughter of the Chief of the Supernatural people! Take her back! I'm afraid of what he will do to us." But Bluejay would not listen to her. He said he wasn't afraid! He should have been, though. For that very night the Chief came - and he stole both his daughter and Ioi away. When morning came, and Bluejay learned what had happened, he raced back to the land of the Supernatural people. Sure enough - there was his wife and his sister. But he couldn't touch them. For the Chief had surrounded them with heaps and piles of bones. And every time Bluejay tried to reach

(MORE)

the girls, the bones would form into bodies and fight him off. But the strangest thing of all was, that when Bluejay would move away, the bones fell into their own little separate heaps again. So Bluejay sat down to think about this. "If they didn't know when I was going to try again, they wouldn't have time to put themselves together. I'll turn quickly, and catch them by surprise!" So-o - he turned quickly, and ran toward the girls as fast as the wind! But the bones were quicker than he! He tried this again and again. Finally, he just seemed to be flying in and away - in and away. And one time, just as the bones were falling into their separate heaps again, Bluejay turned so fast, he caught them all in a heap! And he mixed them all up in one big heap! Then when they tried to form into bodies, they had the wrong heads, and arms, and legs! (CHILDREN ALL LAUGH OUT) Bluejay flew around so fast and for so long, mixing up the bones more and more, until finally he was really flying, with wings - and was swooping down on the bones from the air. He was making "chatterry" "fussy" sounds (BACKGROUND SOUND UNDER OF REAL BLUEJAY CRIES - IN AND OUT) as he flew: in and

(MORE)

in and away - in and away. When the bones were all mixed up so that they couldn't even find heads or arms or legs, Bluejay swooped down (REAL BIRD CRY IN CLOSER) - snatched up both of the sleeping girls (CRIES "DIE" IN THE DISTANCE UNDER) and flew away with them. But he wasn't a boy any longer. He was a bird! So the girls didn't mind doing all the work while he played and sang his chattery little sounds as he flew around them. And - to this day, all bluejays make these "fussy" sounds as they fly and swoop down on other birds, or people, or just anything.

GENERAL: My goodness, Molly, where did you learn so many stories about nature's children?

MOLLY: My grandmother told me most of them. And my grandfather ---

GENERAL: Use to tell you and all his grandchildren real stories, as he did his own children. The first story I remember that he told me, was a strange change that nature does make - a tadpole into a frog.

GRETCHEN: Oh yes, I know that story, too! But I like both kinds. And - (BEGIN FADE) - when you know what's real and what's make-believe --- (OUT)

JIMMY: (SLOW FADE IN) And we do. But we had such fun all summer, hunting things in the woods ---

BUDDY: --- and hearing both kinds of stories about them

GRETCHEN: --- that we decided to have the same kind of fun in a little different way, all school year, too.

JIMMY: Yes, and we want to share it with all of you who are listening to us.

BUDDY: We formed a club, and the General and Molly are members, too ---

GRETCHEN: --- and will be here every week with us ---

JIMMY: --- really with us, beginning next week .

BUDDY: They are going to tell us stories about things we study in our science books ---

GRETCHEN: --- instead of things we find in the woods.

JIMMY: We won't know, either, what their stories will be about, until the club meets each week.

BUDDY: We made up a "guessing-game" at our school, so each of us has a chance to guess one thing we think the General and Molly may talk about at each meeting of our club.

GRETCHEN: Yes, we have a "Guessing-Box" in each Primary classroom, and all week, as we have our science lessons, we can drop a slip of paper in the box with the name of what we think they will talk about that week written on it.

JIMMY: But you can only have one guess each week!

BUDDY: Uhuh, and our "Guessing-Box" is made out of an oatmeal box ---

JIMMY: --- ours is a candy box, covered with ---

GRETCHEN: (CUT IN) I'm sorry boys, but we aren't going to have time to describe how our "guessing-boxes" are made. The boys and girls listening to us can get their teachers to help them plan one if they want to join our game. We've got to go, now.

JIMMY: Aww -- well, see you next week.

BUDDY: (Laughing)- You can't see them, Jimmy!

GRETCHEN: But they will hear us - and the General ---

JIMMY: --- and Molly!

CHILDREN'S GOOD-BYE'S FADE UNDER)

(MUSIC: IN ... UP TO FULL).

Based on an account in Sykes, op. cit., p. 36-37.

Teacher References

I. "General Science"

Comstock, Anna Botsford. Handbook of Nature-Study (Ithica, New York: Comstock Publishing Company, Inc., 1939)

"Feathers as Clothing," pp. 29-30.

"Feathers as Ornaments," pp. 31-32.

"Eyes and Ears of Birds," pp. 33.

"Feet of Birds," pp. 40-41.

II. "Molly Myth"

Farmer, Florence V. Nature Myths of Many Lands. (New York: American Book Company, 1910)

"The Origin of Swallows," pp. 78-80.

"The Wind Bird," pp. 13-16.

"The Story of a Bird," pp. 101-103.

III. Follow-up Suggestions.

A. Dramatics.

1. "Mrs. White Hen's Mistake," from The Child Dramatic Playlet by C. T. Byrce. Charles Scribner's Sons, New York. (Grades 1-2).
2. "Sparrow and the Bush," Ibid.,
3. "Ladybird," from A Book of Plays for Little Actors by E. I. Johnson and M. D. Barnum. American Book Company, New York. (Grades 2-3).

B. Nature Reading Club. This is an especially valuable activity for a rapid reading group. It gives them a reading-with-a-purpose theme for supplementary reading. It also seems to keep slower readers from feeling "left out," since it is a "choose for yourself" activity among other possibilities in connection with the Project. This gives the slower readers the feeling that they just didn't "choose" to participate in this one. Start the group off by reading to them:

1. An Introduction to Birds by John Kieran, Garden City, New York: Garden City Publishing Company, 1950.

Suggestions for their own reading:

2. Alexander the Gander by Tasha Tudor, New York: Oxford University Press, 1939. (Grade 1).
3. Greylock and the Robins by Thomas P. Robinson, New York: The Viking Press, 1946. (Grade 1).
4. The Tale of the Crow by Henry B. Kane, New York: Alfred A. Knopf, Inc., 1943 (Grade 2).
5. Mrs. Mallards's Ducklings by Loloia Delafield, New York: Lothrop, Lee and Shepard, 1946. (Grades 2-3).
6. Everyday Birds by Gertrude E. Allen, Boston: Houghton Mifflin Company, 1943. (Grade 3).

C. Group Experiences.

1. Bird Observation Expeditions. To parks, zoo, poultry farms, or any opportune place.

2. "The Question-Box." A "game" by which, as the script children explain, each child may "cast a vote" or "guess" what they think the program for the coming week will be about that they have had in their science during the week. The outcome value it has is that the child will give closer attention to each thing studies during the week. Each animal they study may stand out more clearly to them by name. The activity may also lead to language skills of word mastery - sight recognition, spelling, writing - in proportion to the individual ability of the group.

Radio Script for Program No. 2.

The program is designed to be presented after Unit 1 on animals has begun for all three of the primary classes. The approximate amount of material anticipated as having been completed is that through page six of all three of the texts. The time scheduling for the scripts to the text material is by no means an absolute necessity for use of the programs with the science series on which they are based. These page references are given thus at the introduction of each of the programs in approximation only. Whether less material or more has been covered will not make any appreciable difference so long as a participating group is in the general vicinity of these page references by the end of the week when the activity is scheduled.

Preparation for this broadcast should be made by the classroom teacher along the following general lines:

1. Explanation and setting up of the classroom "Question Box," if the activity is to be adopted. These "guesses" should be collected during the week as the area

to be covered on the broadcast is being covered in the class work. However many or few skills-acquisition in the language arts area are outcomes of this activity, it should serve as a motivation for attention and concentration to the week's work in science.

2. Pointing up of the "surprise of the week" idea (the script will clarify this point) in classroom work of the week. This should give the listening children a feeling of participation. Their "proxies" on the program learned "surprising" things during the week - they did, too.

3. Any further preparations will be directly related to whatever follow-up activities were initiated at the end of the first broadcast. The individual teacher will be aware of her own requirements in this area.

The general science concepts touched upon in this program are: (a) establishing the generic term "animals;" (b) furthering the concept that animals can be classified into kinds (adding insects); (c) specifically pointing up the general characteristics of one kind (insects); (d) noting that animals within a classification may differ in many ways (color, marking, shape and body covering - with the frog-tadpole, butterfly-moth sequence exemplifying); and (e) introducing the idea that other animals fall outside the three main classifications of mammals, birds, and insects (the spider).

The usual references and suggestions follow the radio script.

(MUSIC: THEME IN ... UP ... UNDER)

GRETCHEN: Hello, there. This is your Science Club of the Air, remember? And this is Gretchen speaking to you. Do you remember who we promised to bring with us this week?

JIMMY: Sure they do. Let me introduce the General! Boys and girls, m-e-e-t "General Science."

GENERAL: (Chuckling) Hello, new friends. My old friends of the summer tell me that they have told you about the fun we all had last summer in the woods. You also learned last week why my other friends call me "the General." Now Gretchen, Jimmy, and Buddy call me "General Science." Can you guess why?

BUDDY: Don't tell them, General. Let them use their "Guessing-Box" to see how many of them can guess. I want to do some intrr--uh--

GRETCHEN: In-tro-duc-ing, Buddy.

BUDDY: Well, fel-low club mem-bers, (AHEMS AND LAUGHTER FROM OTHER CAST MEMBERS) here's Molly!

MOLLY: (STILL LAUGHING) Hello, "fellow club members." I'd like to tell you that I, too, have a special name that the children have given me - Molly Myth."

- GRETCHEN: It certainly won't be hard for anyone who heard our first program to guess the reason for that!
- GENERAL: I wonder what our club members have been studying about in science since that first meeting.
- JIMMY: The same thing we have in our class, I guess. If they are in Primary II.
- BUDDY: And the same as my class if they're in Primary I.
- MOLLY: AND the same thing as Gretchen's class if they are in Primary III! But what?
- CHILDREN: (IN UNISON) ANIMALS!
- GENERAL: Good gracious! That could be so many things!
- BUDDY: It sure was: birds, and cows, and dogs, and ---
- JIMMY: --- and bears, and chipmunks, and skunks, and --
- GRETCHEN: --- and squirrels, and raccoons, and fish, and -
- MOLLY: THIS could go on forever! What are we going to do with them, General? In the woods, we found some one thing, we all looked at it, asked questions about it, and you answered them.
- GENERAL: And then you thought of a story about it. But now we must think of a different way --- let me see --- how would you each like to tell us the one thing you learned last week that surprised you most?
- CHILDREN: Oh, yes!
- BUDDY: I know! (Rapidly) That toads aren't frogs and frogs aren't toads!

GENERAL: My! That's a mighty big thing for a little boy to learn in his first week of "real" school.

BUDDY: But I forgot the reason they aren't.

MOLLY: You mean how they are different, Buddy?

BUDDY: Yes. "General Science," will you pretend that we just found a toad in the woods and that I called it a frog, and then you say "no," and tell me why?

JIMMY: Why don't we just begin with the "why?"

GRETCHEN: Yes, that would save time.

BUDDY: Well, all right, but let's begin. How are toads and frogs not the same?

GENERAL: They do look a lot alike, Buddy. But the sharp eyes of a little boy could look closely and see a few things different about them. For one thing, the frog is not covered with great warts, as the toad is. And the warty-looking toad is fatter than the frog, too. But the frog has larger and stronger back legs than the toad.

JIMMY: Then he can jump higher and faster than a toad can, I bet.

GENERAL: Yes, the frog can jump higher and faster than a toad, Jimmy. And he is also more likely to be brighter colored, with lots of green and yellow in his coat.

BUDDY: Gee, I bet I'll know which is a toad and which is a frog the next time I see one of them.

JIMMY: I'll know which is a butterfly and which is a moth the next time I see one of them, too.

MOLLY: Was that your "surprise" of the week, Jimmy?

JIMMY: Yes'm. And I think I remember about it, too.

GENERAL: Let's see if you do, Jimmy. First, what kind of animals are butterflies and moths?

JIMMY: They're insects, and ---

BUDDY: What's an insek?

GRETCHEN: (Quickly) An animal that has six legs, two feelers, and two wings. Go on, Jimmy. I want to tell my surprise, too.

JIMMY: Well, butterflies and moths are a lot alike when you first look at them. But if its daytime when you see one, it will be a butterfly, because you hardly ever see moths except at night. And if its resting, -- I mean if its not flying, and is holding its wings straight up above its back, then its a butterfly, because moths fold their wings up when they aren't using them to fly. They both have two feelers on the front of their heads, with little knobs on the ends of them. But the feelers of a butterfly are straight and a moth's feelers are kind of bent.

GENERAL: Good boy, Jimmy! That's really a lot for you to have remembered.

JIMMY: (Proudly) I got a book¹ at the library with big pictures of them that I could see really good. Gretchen got a book, too, that same day ---

MOLLY: I'll bet it had something to do with her surprise of the week.

GRETCHEN: Yes, it did. It was a book about lots of animals - but all of a special kind - a kind that don't have back bones.²

BUDDY: My goodness! How do they stand up, or walk?

ALL: (LAUGH)

GENERAL: Not all animals do stand "up" or "walk," Buddy. Nor do they need to. "Walking" is how we - and lots of animals - do move about. But others move about in other ways.

BUDDY: Y-e-s! Worms crawl ---

GRETCHEN: And the animal that was my surprise of the week crawls, too - a spider.

JIMMY: Oh, boy! Spiders! I like to watch them make webbs.

GRETCHEN: Well, the reason I wanted to learn more about the spider was because I was afraid of them, and I didn't like to watch them in their spinning.

GENERAL: Are you afraid of them now, Gretchen?

GRETCHEN: No-oh! I learned ever so much about them! That

(MORE)

they don't use their poison except when someone or something hurts them or when they have to put the insects to sleep that they need for food. And this was my surprise of the week - spiders are not insects! I thought they were.

MOLLY: How did you learn that they weren't?

GRETCHEN: I hope I remember as much about my surprise of the week as Jimmy did his. Let me see -- first, spiders have eight legs, and insects have only six; and most insects fly, but --

BUDDY: --- spiders crawl!

GRETCHEN: Yes. And something else -- something about their bodies, that I can't remember!

GENERAL: A spider has just two parts to its body, but an insect's body has three parts.

GRETCHEN: Yes! that's it! Thank you, "General Science." Well, I didn't remember as much as Jimmy did, but I did remember some ---

BUDDY: Is everyone through rememberin' now? Because I'm ready to hear Molly remember something -- another story!

JIMMY: Yes! Me too!

GRETCHEN: Oh, yes. I am, too! What will you "remember about" today, Molly?

MOLLY: Well -- now, let me see -- yours was spiders, --

(MORE)

Jimmy's was about moths and butterflies, and Buddy's was about toads and frogs. I know a story about each of them. Which shall it be?

BUDDY: About my surprise! Frogs, please.

GRETCHEN: Buddy is the youngest. I don't mind if the story is about his surprise. Do you, Jimmy?

JIMMY: No. I'd like to hear a story about frogs.

MOLLY: Very well. I'll tell you the story of a frog who drank up all the water in the world.³

BUDDY: Ooooh! Did he -- burst?

ALL: (LAUGH)

GRETCHEN: Just wait and hear, Buddy. Please begin, Molly.

MOLLY: Once, long ago when the world was very young, all the water on earth was kept inside a great mountain. The mountain was hollow inside, like a big tank. And the only opening to it was closed tightly with a smooth stone. All the creatures ---

BUDDY: What's "creatures?"

GENERAL: That means animals, Buddy.

BUDDY: Oh!

MOLLY: --- all the creatures of the earth had to come to this mountain for water when they wanted it. A big turtle was keeper of the stone. All the creatures were bigger in those days. Sometimes

(MORE)

Mr. Turtle didn't let the animals have as much water at one time as they wished they could have. Freddy Frog, for one, just never got as much water as he wanted. He liked lots of water ---

JIMMY: He's a water animal.

MOLLY: Yes, and in those days, he wasn't allowed enough water to have a pond to live in. One day, when Freddy Frog came to the water-mountain for his share of water, he found Mr. Turtle asleep. At first he thought he'd wake him. Then -- "No," he thought, "I'll not wake him! This is a good chance to get enough water to make myself a nice cool, WET, pond to live in! But how will I carry it away? Hmmm. I know! I'll carry it in my stomach. I can hold it! S-o, as qui-etly as he could, he rol-l-ed the smooth stone away, and quickly put his mouth to the opening! (SOUND: WATER FLOWING IN "GULPING" RHYTHM - NOT TOO LOUDLY - SLOWING TO GRADUAL STOP. LONG, "SOFT" SIGH FOR FROG). And then Freddy Frog started to move away. At least he tried to move -- but he couldn't move a muscle!. He was too heavy with all that water inside of him. And before he had time to think what to do, Mr. Turtle yaw-n-ed, and opened his sleepy eyes. The first thing he

(MORE)

saw was the stone gone from the water-mountain opening! And all the water gone! He jumped up - and then he saw Freddy Frog sitting there, so fat looking! Mr. Turtle knew at once what had happened. "You greedy frog!" he said. "You have stolen all the water in the world! Give it back!" But Freddy Frog wouldn't even open his mouth. Try as he would, Mr. Turtle could not make Freddy Frog give back the water. "Oh dear," he thought, "What shall I do! The other animals will blame me for being asleep. But, I must tell them. For none of us will have any water if we cannot make Freddy give it back." So he set up a loud roar to call the animals together. Perhaps he yelled to loud and so long that he lost his voice and had none to pass on to other turtles! The sound he made was terrific! (ECHO EFFECT)

"Come to water-mountain, everyone! Come quickly, something has happened!" And the sound rolled over the hills and valleys of the whole earth until it reached every creature. (RUMBLING SOUNDS SLOWLY RECEDING BEHIND) Soon they all came running, from every direction. And when they saw Freddy Frog, they knew what had happened, too!

(FADES - IN AND OUT - UNDER FOLLOWING, WITH

(MORE)

ACCOMPANYING, APPROPRIATE SOUNDS OF "FUSSY,"
"PLEADING," "DEMANDING" TONES, MOVEMENT, ETC.)
They all began quarreling at Freddy: "Why should
you have all the water!" "It belongs to all of
us." "I need just as much water as you do." And
then they started pleading with him: "Please,
Freddy, don't keep all of the water," "We must
have some, too, you know." "Oh, we shall all die
of thirst!" "Whatever shall we do!" And THEN
they began to get very ANGRY: "You give it back,
do you hear?" "Right this very minute!" "We
want our share of that water!" But nothing they
did or said made any difference with Freddy. He
just sat there and stared at them with his mouth
tight closed. Finally, Mr. Turtle said, "Come
over here, all of you." And he led them far
enough away so that Freddy Frog couldn't hear.
Then he said, "The only way we are ever going to
get that water is to make Freddy open his mouth.
He's so full, if he does open his mouth, the water
will flow right out. "I know!" said Mr. Eel,
"make him laugh." "Humph!" said Mr. Turtle, "he
just never laughs." "I can make him laugh," said
Mr. Eel. (IMMEDIATE "HUB-BUB," - VARIOUS VOICES)
"Oh, try!" "Yes, please do!" "We are all so

(MORE)

thirsty!" So they all went back to the spot where Freddy sat, solemnly staring at them with his eyes "bugged" out and his mouth tight shut. Mr. Eel moved over right in front of Freddy and began to wiggle and twist and turn in a funny kind of dance. Everyone watched Freddy very closely as Mr. Eel danced and danced, closer and closer to Freddy. If they all had been watching Mr. Eel dance, they would have just "died" laughing, for you never saw such a funny dance as he did. But they were all too busy watching Freddy! Soon, they saw the corners of his mouth twist up - then he stretched his mouth into a little smile, and then HE LAUGHED OUT LOUD (SOUND UNDER, FIRST WITH A BIG LAUGH, THEN SWELLING INTO A "JOYOUS CHORUS" AS THE OTHER ANIMALS JOIN IN - MINGLED WITH SOUND OF FLOWING WATER, SUBSIDING UNDER) And the water flowed out over the whole wide world! It filled the dry ponds and every low place on the earth. Now everyone had water, as much as he pleased, without going to water-mountain for it. So - no one was really angry with Freddy Frog any longer, for he had got the water out of the mountain for them.

JIMMY: Some frog! That was really a good story. But

that's not really how water got all over the earth, and in the rivers, and lakes and ocean!

GENERAL: (Chuckling) Jimmy, your name should be "Thomas".

BUDDY: Why, General?

MOLLY: He just means that Jimmy always thinks of the real way things are, even though he does enjoy my stories as much as you and Gretchen do.

GRETCHEN: Sure he does. But I guess it's my "duty" now -- as club president -- to dismiss the meeting, --

BUDDY: What's "dismiss?"

GENERAL: That means it's time for us to go, Buddy. So -- see you all next week.

JIMMY: There, Buddy! The General said "see" you next week.

MOLLY: That's just a way of saying "we'll be back with you next week."

BUDDY: Yes, I know, now.

GENERAL: I wonder how many of the boys and girls think they know what we might talk about next week.

GRETCHEN: Put it in your classroom "Guess-Box." We've got to go!

(MUSIC: START UNDER ... AS)

CHORUS: GOOD-BYE'S RAPIDLY FOLLOWING EACH OTHER)

(MUSIC: SWELL TO FULL)

¹Butterfly and Moth Book by Ellen Robertson-Miller,

(New York: Charles Scribner's Sons, 1931).

²Animals Without Back Bones by Ralph Buchsbaum
(Chicago: The University of Chicago Press, 1938).

³Louis Herbert Gray, John Arnott MacCulloch, and George Foot Moore, (eds.) The Mythology of All Races in thirteen volumes (Boston: Marshall Jones Company, 1917-1931), IX (Oceanic Myths) 279. The plot of this story is constructed from two separate accounts of Australian myths of the origin of the sea or lakes and waters. Editorial responsibility in this set is actually divided by volumes, but for convenience in reference, the source will be referred to hereafter by "Gray, op. cit., Volume (title) page." Full documentation will be found in the Bibliography, under "Gray," and also "MacCulloch."

Teacher References

I. "General Science"

Beauchamp, Wilbur L., et al., Discovering Our World, Book One (Chicago: Scott, Foresman and Company, 1937).

Frogs and toads, pp. 35-36; 50, 58-63.

Butterflies and moths, pp. 32, 53-54, 56.

Beauchamp, Wilbur L., et al., Discovering Our World, Book Two (Chicago: Scott, Foresman and Company, 1938).

Frogs and toads, pp. 237, 265-266, 290, 297.

Butterflies and moths, pp. 239, 296, 327.

Spiders, pp. 29, 45, 310.

Beauchamp, Wilbur L., et al., Discovering Our World, Book Three (Chicago: Scott, Foresman and Company, 1939).

Toads, pp. 25, 101, 114.

Moths, pp. 37-38.

(Reference to the above sources will be by title only hereafter).

Comstock, op. cit., Spiders: pp. 434-450.

Craig, Gerald S. Science for the Elementary-School Teacher (Boston: Ginn and Company, 1940).

Spiders: pp. 140, 333, 335.

II. "Molly Myth"

Gray, op. cit.,

- "A frog who supported the earth," IV (Finno-Ugric and Siberian Myths) 311, 319-320.
 "A tale of Mr. Butterfly and his flowers," VIII (Chinese and Japanese Myths) 345-346.
 Spiders (various facts from which different stories may be composed) VII (Armenian-African Myths) 121, 132, 134, 135, 208-211, 213, 284, 286, 309, 321-333, 401.

III. Follow-up Suggestions.

A. Dramatics.

1. "Spider and the Fly," from A Book of Plays for Little Actors by E. L. Johnson and M. D. Barnum. American Book Company, New York. (Grades 2-3).
2. "Guest of the Butterfly," from Five Plays and Five Pantomimes by Sidney Baldwin. The William Penn Publishing Corp., New York. (Grades 3-5).
3. "Frog Fairy," from Harper's Book of Little Plays by M. D. Barnum. Harper and Brothers, New York. (Grades 4-6).

(The two latter plays may be adapted to the primary level easily).

B. Nature Reading Club.

(Teacher to children)

1. Sphinx, The Story of a Caterpillar by Robert M. McClung. William Morrow and Company, New York, 1949.
2. Johnny and the Monarch by Margaret Friskey. Children's Press, Chicago, 1946.

(Children's Reading)

3. Little Squeegy Bug by William I. and Bernard H. Martin. Tell-well Press, Inc., Kansas City, Mo., 1945.
4. The First Book of Bugs by Margaret Williamson. Franklin Watts, New York, 1949.
5. Insect Allies by Eleanor King. Harper and Brothers, New York, 1938.
6. Science Stories, Book One; by Wilbur L. Beauchamp, et al., Scott, Foresman and Company, Chicago, 1933. "Water Animals," and "A New Animal," pp. 74-78.

7. Science Stories, Book Two, by Wilbur L. Beauchamp, et al. Scott, Foresman and Company, 1935. "A garden spider," p. 56; "Where Water Goes," pp. 115-117.
8. Science Stories, Book Three, by Wilbur L. Beauchamp, et al. Scott, Foresman and Company, 1936. "A horned toad," p. 16; "The Trap-Door Spider's Nest," pp. 97-99.

(Reference to the last three sources will be by title only hereafter).

C. Group Experiences.

1. "Question-Box." Some sort of recognition for any child who came even close to the program topics with his "guess."
2. Science Experiences for Little Children by Charlotte G. Garrison. (New York: Charles Scribner's Sons, 1939).
With a turtle, p. 24.
With butterflies and moths, p. 27.

The next six programs on the first science unit continue in the same basic pattern as these first two, with these constant functions of the characters maintained: Gretchen, as "club president," is the program "announcer" for each script as it comes on the air. All three of the children contribute lead conversation that will bring the other two character "on mike." The choice of the topic for the week is introduced through five-way conversation of the entire cast. The General and the children hold the center of attention during the first part of the program while scientific factual material is the main topic of conversation, but Molly is given occasional commentaries in order to keep her "alive" in the listening children's minds. Her

lead-in for her own contribution to the program is also more smoothly accomplished by this technique. An Opening and a closing point is chosen from a linking thought with the previous and the following programs whenever this is at all possible.

With these facts in mind, the following description of programs three through eight will be more easily projected in the mind of the reader into completed radio scripts.

Content Summary of Program No. 3.

The program is designed to follow completion of page ten in all three of the primary texts. The science concepts touched upon are indicated by the summarized contribution of the script children. This is true for all content summary presentations, and need not be repeated with each of them.

The contributions of the script characters are, in summary: Buddy - animals can be the same "kind" and still be different (i. e., though animals of the same kind have certain common physical characteristics, they may differ in shape, size, color, marking, or body covering) and baby animals are like their parents in some ways but not in all ways (i. e., they are alike in gross structure, but smaller, with undeveloped body coverings and ability to do things for themselves). His guess for the topic of the week is "baby birds." Jimmy - review of the above general concepts with addition of distinguishing characteristics of mammals

and insects (i. e., insects have six legs, two feelers or antennae, and mammals are born, feed on milk from their mother's bodies, and have hair on their bodies). His guess for the topic of the week is "a skunk family." Gretchen - animals can be divided into groups by the kinds of food they eat and how they get it (i. e., fish are equipped to locate, pursue, catch and eat food in water but not on land, and some mammals and snakes can get food both in water and on land). Her guess for the topic of the week is "the woodcutters" (beavers). The General - leads the children into clear statements of their concepts and clarifies with re-statements when necessary. Molly - tells the African myth of "why snakes have no legs."¹

¹John Arnott MacCulloch and George Foot Moore (eds.) The Mythology of All Races (Boston: Marshall Jones Company, 1925), VII, 260.

Content Summary of Program No. 4.

The program is designed to follow completion of page thirteen in all three of the primary texts.

The contributions of the script characters are, in summary: Buddy - baby animals change, just like we do, as they grow older (i. e., they change in appearance, size, and ability to do things, with the resemblance between them and the parent increasing as they grow). His guess for the topic

of the week is "horses." Jimmy - baby birds hatch from eggs, change some while they are growing up, but frogs and moths change a lot from "babies" to grown-ups (i. e., life cycle of frogs and moths, with the series of structural changes from tadpole and caterpillar). He slyly makes no guess for the topic of the week, "just to see" if the General would talk about what he had in mind without telling it. Gretchen - animals get their food in many ways, because they are made differently (i. e., some animals have structures that enable them to walk, run, hop, crawl, or fly, and thus pursue food on land, while others have structures that enable them to swim and pursue food in water, and still others have structures that enable them to pursue food in both water and land habitats). Her guess for the topic of the week is "an octopus." The General - leads Buddy into clarifying and restating his concepts, guides Jimmy into seeing that people are mammals when he has objected to a reference to himself as an animal, and extends Gretchen's contribution by giving the term locomotion for her "way animals get around" statement (using a train locomotive as a clarifying comparison). Molly - tells the story of "where frogs came from."¹

Thomas Bulfinch, The Age of Fable, with revisions and additions by W. H. Klapp (New York: The Heritage Press, 1942), The Greek myth of Latonia and the Rustics, pp. 38-39.

Content Summary of Program No. 5.

The program is designed to follow completion of page sixteen in Look and Learn, page seventeen in All Around Us, and page nineteen in How Do We Know?.

The contributions of the script characters are, in summary: Buddy - animals move about to keep alive and live in various environments in keeping with their powers of locomotion. His guess for the topic of the week is "the bumblebee." Jimmy - animals much have food to live and grow and some animals are born but others are hatched from eggs. His guess for the topic of the week is "a tiger cub." Gretchen - a "diagram" shows parts of an animal, and this helps us decide what kind it is (i. e., body characteristics as a means of determining whether an animal is a bird, a mammal, or an insect, and its differences within its own species). Her guess for the topic of the week is " a raccoon." The General - extends Buddy's contribution with information about the bumblebee's hibernating habits, Jimmy's contribution with information about special characteristics of cats as a species, and Gretchen's contribution with information about the hibernating habits of the raccoon. Molly - tells the Mongolian folk story of "Why the Bee Buzzes."¹

 Farmer, Op. cit., pp. 126-130.

Content Summary of Program No. 6.

The program is designed to follow completion of page

nineteen in Look and Learn, page twenty in All Around Us, and page twenty-three in How Do We Know?.

The contributions of the script characters are, in summary: Buddy - animals that live different places eat in different ways (i. e., the relationship of land, water, and air to animal locomotion and food-getting habits). His guess for the topic of the week is "a duck." Jimmy - baby birds are fed different ways and have different kinds of parents (i. e., the food habits and degree of parental care received by baby birds and mammals). His guess for the topic of the week is "a quail." Gretchen - how animals eat depends on what kind of mouth they have (i. e., the mouth structures in relation to the food habits of animals). Her guess for the topic of the week is "the garter snake." The General - has Buddy illustrate his concept by leading him to find one animal (the duck) that uses land, water, and air for three modes of locomotion, walk, swim, and fly; extends Jimmy's contribution with information about the nesting and covey habits of quail; and enriches Gretchen's contribution with details about the jaw structure of a snake. Molly - tells "where quail came from."¹

Bulfinch, op. cit., p. 162 (Daedalus and Perdix).

Content Summary of Program No. 7.

The program is designed to follow completion of page

twenty-two in Look and Learn, page twenty-three in All Around Us, and page twenty-nine in How Do We Know?.

The contributions of the script characters are, in summary: Buddy - some animals get their food for themselves, others don't (i. e., contrasting food-getting habits of wild and domestic animals). His guess for the topic of the week is "the fox." Jimmy - some animals take care of their own babies, others don't (i. e., the protection given animal babies by their parents and that given domestic animals by man). His guess for the topic of the week is "an alligator." Gretchen - how animals eat depends on how they are made (i. e., the structure of animals in relation to the securing and devouring of food). Her guess for the topic of the week is "the owl." The General - enriches Buddy's contribution by describing a winter feeding table for birds to be made by a boy; extends Jimmy's contribution by distinguishing between the alligator and the crocodile; adds to Gretchen's contribution by telling of another animal bearing the name "owl" which is not a bird, the Night or Owl Monkey. Molly - tells the Malayan folk story of "why the owl does not go about in the day time."¹

Farmer, op. cit., pp. 123-125.

Content Summary of Program No. 8.

The program is designed to follow completion of page

twenty-four in Look and Learn, page twenty-seven in All Around Us, and page thirty-three in How Do We Know?.

The contributions of the script characters are, in summary: Euddy - animals have homes just as we do, and many animals help us in lots of ways (i. e., animal homes and how man uses animals). His guess for the topic of the week is "a bear." Jimmy - animals move around in different ways, get food in different ways, and grow up in different ways (i. e., review of locomotion as a factor in food-getting and fundamental concepts of animal growth). His guess for the topic of the week is "the turtle." Gretchen - in winter, when food is hard to find, some animals sleep and others eat what they worked hard to find before winter came (i. e., the specialized adaptations of animals to the scarcity of food in winter). Her guess for the topic of the week is "the bear." The General - enriches Euddy's and Gretchen's contributions with information about the bears eating and hibernating habits, and extends Jimmy's contribution with comparisons of "turtles, tortoises and terrapins, what's the difference?" Molly - tells the Finnish folk story of why bears have short tails.¹

¹Farmer, op. cit., pp. 155-157.

Radio Script for Program No. 9.

This program is the concluding broadcast for the first

science unit, Animals. Primary I is scheduled to have completed their unit before last week's broadcast. They will presumably have spent the week reviewing the concepts learned throughout the unit and completing whatever activity projects have been going forward with the unit. Primary II will have had only one page since last week's broadcast, page twenty-eight of All Around Us. This is a picture story designed to check understanding of the fundamental concepts of animal growth and to promote ability to follow sequent nature growth. The rest of their week may have been spent in making similar stories, picture or written, for as many of the animals they have had in the unit as is practicable on the basis of individual abilities of the group. Primary III will have covered the last three pages of their unit, had a review, and completed whatever projects they may have had underway during the unit.

The pre-broadcast preparation for this program, and for each of the broadcasts in the series which conclude a unit of study - programs 18, 28, and 35, - requires a more uniform type of teacher-preparation for all participating groups than any of the intervening programs. Of course the detailed preparation will depend upon what each classroom teacher has had underway with her own class in the way of enriching and extending activities during the study of the unit on animals. There are many suggestions for such activities throughout the guidebooks for all three of the

texts. But the specific pre-broadcast preparation necessary for this unit-concluding program must be in the nature of "giving away the program plan." Tell the children something along these lines: "I had a very special letter this week. It was from someone you all know very well - "General Science" of the Science Club of the Air. He told me a secret. And he told me to tell you. This (name the day of the broadcast), Gretchen, Jimmy, and Buddy are going to do something special. They are each going to tell us about one thing their class has done while they have been studying about animals that helped them to learn more about animals. The General said he thought you would like to know about it, but not to tell anyone that you do know. This week, you see, we won't be using our "Guess-Box" because we don't have to guess, we know what the program will be about."

An even better plan would be to write this information in an actual letter and bring it to class to read to the children. If the series is being used by a school system or an educational group as a school-of-the-air activity incorporated into the curriculum, such a letter could actually be mailed to each participating group.

It is suggested that after this revelation, the teacher make plans with her own group for preparing an exhibit of their own project, or "best project, if more than one has been underway, to be displayed the day of the broadcast as they listen. This should give them a very real

feeling of participation. Perhaps they may even have a similar project to one described by one of the script children. If the series is being used as a Primary Assembly Program activity, the idea lends itself to that purpose very nicely.

The usual references and suggestions follow the radio script.

(MUSIC: THEME IN ... UP ... UNDER)

GRETCHEN: Hello, hello! The Science Club of the Air is having a parade!

(MUSIC: "FANFARE" ... "PARADE TUNE" ... OUT ... UNDER)

JIMMY: A parade of pr - prah - jects! (projects)
(LAUGHTER)

BUDDY: The General is going to lead the parade!

GENERAL: No, Buddy. I'm just going to "announce" the "march of science" projects.

MOLLY: Don't you think you'd better tell the boys and girls listening - and me - what you are talking about?

GRETCHEN: Oh, they know!

JIMMY: They do?

BUDDY: How do they know?

GRETCHEN: Hey! That's our science book, not yours!
(LAUGHTER)

MOLLY: Well, I repeat - how do they know, and what do they know?

JIMMY: And how do you know that they know, Gretchen?
(MORE LAUGHTER)

GENERAL: (STILL CHUCKLING) I think I'd better explain.

MOLLY: I think you had!

GENERAL: Well, Gretchen told me what the Primary classes in her school were doing this week - finishing up all the things they had been working on while they've been studying animals, and what they were planning to do with these things , --

BUDDY: --- have a parade of animal projects in the auditorium!

MOLLY: And you just moved the parade to the broadcast instead?

JIMMY: Not all of it, just part of it. But I want to know how Gretchen knows that the boys and girls listening know!

MOLLY: I'll bet the General told them, some how!

GENERAL: Yes. I wrote a letter to their teachers, telling them what Gretchen, Jimmy, and Buddy were going to do today, ---

GRETCHEN: We're going to be "reporters!"

JIMMY: And "report" the things our school did, and each of our classes ---

BUDDY: --- and each of us brought one thing we did of our very own!

MOLLY: My goodness! This "parade" may be long. Hadn't it better begin?

GENERAL: Yes. A-ten-tion! (BACKGROUND ROLL OF DRUMS)
To head the parade: "Miss President of the
Science Club! pre-sent-ing - the project of
her school!

GRETCHEN: Oooh! You scare me, General! (LAUGHTER)

JIMMY: Go on, Gretchen! Tell them what the boys did,
and what the girls are doing ---

GRETCHEN: Yes, I will! The boys in all three primary
classes together built a beautiful bird house, -

BUDDY: --- and put it up on the playground on top of a
big pole!

JIMMY: Of course, some of our fathers helped put it up, -

GRETCHEN: And helped some while you were making it.

BUDDY: And the whole school watched our "Bird Hotel" all
spring!

MOLLY: To see what "guests" used it?

GRETCHEN: Yes! And if we knew them. And now, the girls
have started an ah-kw--, ah--

GENERAL: An "ah-kawr-i-um?"

GRETCHEN: Yes. Our teachers helped us ---

JIMMY: And your mothers!

GRETCHEN: Yes, our mothers and teachers helped, especially
when they all came out to the lake to gather
plants and rocks and things to go in it.

BUDDY: Your daddy helped catch the tadpole and turtle --

JIMMY: --- and the baby catfish and the perch.

GRETCHEN: But we caught the dragonfly and the little "bug" that darts around over the water.

GENERAL: Whirligig beetle.

BUDDY: And they are in the front hall at school, where we all can watch them when we come in every morning.

JIMMY: Or any time we are in the hall.

GENERAL: Take over from there, Jimmy. (BACKGROUND DRUM ROLL UNDER) Primary II, reporting!

JIMMY: Uh, ---

MOLLY: Now you "go on," Jimmy. (LAUGHTER)

JIMMY: (BIG BREATHE) Our class made a big book of pictures, with a cardboard front that our teacher helped us paint big letters on. They say: "Mother and Father Birds." We had lots of pictures that we had pasted to sheets of paper right from the first week of school. Then when we learned how different mother tanagers were from father tanagers, and the Goldfinch were so different, too, we started looking for other kinds of birds that were the same kind but looked different if they were the mother bird than they did if they were the father bird.

BUDDY: I saw the book! There were some ducks in it.

GENERAL: Mallards, I suppose.

JIMMY: Yes. And another pair that the mother is "just

(MORE)

plain brown" and the father has lots of colors, with a "white collar."

GENERAL: The Ringed-Necked Pheasant?

JIMMY: I think so. We got them, and lots of other pictures from a Sos-i --uh--

MOLLY: The National Geographic Society?

JIMMY: Yes, that's it.

BUDDY: May I tell what my class made now?

GENERAL: I guess we had better move "the parade" along.
(BACKGROUND DRUM ROLL) Primary I, reporting!

BUDDY: (Quickly) We made a "movie" of "Places Animals Live."

GRETCHEN: My goodness! I can't even run a "movie" camera! And I'm older than you.

BUDDY: We didn't need one. We made our "movie" from the pictures we started saving from the first week of school, too. Then when we learned all the different kind of places animals live, we made pictures of their homes and pasted them to the bottom of the picture of the animal that the home belonged to.

JIMMY: How is that a "movie?"

BUDDY: Well, last week, when we got all through with the things our books told us about animals, we put all the pictures of animals that had "home" pictures pasted to it and put them all together

(MORE)

in one long line. Then our teacher helped us roll the long "page" up on a broomstick ---

MOLLY: And when you unroll it, all the animals and where they live "march" right down from top to bottom!

GRETCHEN: Are you going to show it to us in the auditorium when we get back to school?

BUDDY: (Proudly) Yes, and I'm going to help unroll it! And I'm going to show my own picture book, too. But it doesn't move, except just by turning the pages - see? (SOUNDS OF "CROWDING AROUND" UNDER FOLLOWING)

JIMMY: These are pictures of you, Buddy!

MOLLY: An album of your baby- and very little-boy pictures!

GENERAL: Did you trace this "foot-print" on the page with your first picture, Buddy?

BUDDY: Yes, but my teacher helped me, and Mother let me use the one Daddy made at the hospital the first day that they got me.

GRETCHEN: Your father is a doctor, isn't he Buddy?

BUDDY: Yes. He helped me make these drawings of my hand, and how long my legs and arms were when this picture was made.

JIMMY: Gee, this shows just how you grew up, like our Story Pictures of the tiger-cub and the baby raccoon in our science book!

GENERAL: How he is growing up, Jimmy. For Buddy can add to this book as he grows taller, heavier, and able to do more and more things.

BUDDY: Yes! And some day, instead of a picture like this, just riding a "bike," I'll have one of me flying a plane!

GRETCHEN: Oh my! Well, if we live on the lake from now until I'm grown, maybe I can add to my "Water Animals" book every year, too.

MOLLY: Is that your own project, Gretchen?

GRETCHEN: Yes, here it is. (THE MOVING ABOUT SOUNDS UNDER)

JIMMY: Let's see it.

GENERAL: What beautiful pictures! Where did you get them?

GRETCHEN: From the Geographic Magazine, mostly. We had lots of old ones.

BUDDY: If you got pictures out of magazines for your book, why would you need to keep living on the lake to make it bigger as you grow up?

GRETCHEN: Because I can only put pictures in it of animals I have seen.

MOLLY: Well, let's see what you have seen. (PAGE TURNING SOUNDS TIMED UNDER FOLLOWING)

JIMMY: Oh boy! An alligator!

BUDDY: In your lake?

GRETCHEN: Yes, but not a very big one.

JIMMY: And lizards, and snakes, and turtles ---

BUDDY: - --- and ducks, and "water-bugs" and a stork!

GENERAL: That's a white heron, Buddy.

BUDDY: Oh.

MOLLY: Here's a pelican. They're salt water birds, aren't they?

GRETCHEN: I saw them in the bay. We do have lots of water animals in our own lake, though. Many of them I didn't know the names of until I started my book. Now I even know a lot of the things they like to eat.

JIMMY: Your whole class made a book about that, 'cause Jerry told me about it.

GENERAL: You haven't reported your class project yet, Gretchen.

GRETCHEN: It's something we did with the animal pictures we collected right from the first week of school. When we got to the part of How Do We Know? that showed us all the different kinds of foods that animals eat, we turned our picture collection into a book about that. We divided the book into three parts, and the class into three "teams." Each team lettered a name page for their part of the book. One part is named "Meat Eaters," another part is called "Plant Eaters," and the last part is "Meat and Plant Eaters."

MOLLY: Then each time you learned which kind of "eater" an animal was you took its picture out of the collection and added it to the book?

GRETCHEN: Yes, we wrote the names of all the kinds of plants or meat we could find out that an animal ate on the back of the picture of the animal.

JIMMY: I have things written on the back of the pages of my feather collection, too.

BUDDY: You have your feather collection on pages?

GENERAL: He does, and very neatly, too. Show them, Jimmy. (MOVEMENT SOUND UNDER)

GRETCHEN: A bluejay tail feather the first thing!

MOLLY: It's just like the one the General found in the woods the day we met you children!

JIMMY: It is that feather. He gave it to me that day. That's when I started my collection.

BUDDY: Is this yellow one a canary feather?

GENERAL: That's a parakeet feather. See the tiny little gray streaks in it?

GRETCHEN: Oooh! Look at this beautiful pink feather. Is it a flamingo feather?

MOLLY: Yes, it says so on the back of the page. Now that's one bird I don't know any stories about.

BUDDY: Is it time for your story, Molly?

MOLLY: There won't be a "make-believe" story today.

JIMMY: Aw -- why not?

GRETCHEN: Molly said there wouldn't be a "make-believe" story, she didn't say there wouldn't be a story.

BUDDY: Well - is there or isn't there going to be a story?

MOLLY: (Laughing) You'd better tell them, General.

GENERAL: Molly thought you might like to have me tell you a story today.

BOYS: (IN UNISON) Oh, boy!

BUDDY: What about, General?

GENERAL: About two Golden Eagles who captured a jack rabbit.¹

JIMMY: Is it a real "true" story?

GENERAL: It is. It was told to me by a friend of mine, a zoologist ---

GRETCHEN: What is a zoologist?

GENERAL: That's a person who studies animals all of the time, and usually, he earns his living that way.

JIMMY: Boy! Would I like that!

GENERAL: You may become a zoologist, Jimmy, with the fine interest you already have in science.

BUDDY: Let's hear about the rabbit and the eagles, please.

GENERAL: (Chuckling) Impatient Buddy! Very well. (PAUSE) My friend was out "eagle hunting" one day. Of course, to a zoologist, that means hunting eagles just to watch them, and learn more about them.

(MORE)

He had climbed a fence, and was walking across a field, when he saw two great Golden Eagles flying in circles. They seemed to be circling about something in the grass below. They were forward at a pretty rapid pace, too, right toward him. So he crouched down quickly behind a near-by bush to watch, as the chase came closer. The Eagles were circling at a height of about thirty feet now, and the rabbit they were chasing was in sight. First one would swoop down on it and then the other, but the rabbit was quick enough to dodge just as the birds struck. Closer and closer to the fence they came. If the rabbit could just reach that fence, maybe he could get to the orchard beyond and lose the eagles by dodging around among the trees. The eagles seemed to know this, for when the chase was about fifty yards from the fence the largest eagle swooped down on the rabbit. It dodged again, But the eagle kept flying low this time. The rabbit ran faster than ever, heading right for the fence. But the eagle was steadily gaining on it, and flying only three feet above the ground. She was about two feet from the rabbit when it passed through the fence. But the eagle did not give up the pursuit. Without slacking

(MORE)

her speed, she raised herself just enough to clear the fence, and, dropping down behind the rabbit, continued the chase. The speed at which she was flying was something wonderful! The rabbit was not dodging around among the trees. Perhaps it was too frightened, but it ran in a straight line down a row of trees. Fast as the rabbit ran, the great black shadow behind drew nearer and nearer. As she came up even with the rabbit, the eagle seemed to hover over it just a second - then POUNCED upon it. There was a short struggle - a cry or two - and all was very still. (SHORT SILENCE).

- MOLLY: Oh, the poor little rabbit!
- JIMMY: Well gosh, the eagle just did what it had to, to get food!
- BUDDY: Y-e-s -- we learned that all animals have to have food to live, just as we do.
- GRETCHEN: That's right. We has pictures in our science book on the page about "Feet" of a hawk chasing and catching a chipmunk that same way. It was a very exciting story, General.
- GENERAL: A real chase among wild things is a thrilling sight. Our time is up, now, though. Next week we'll be talking about something besides animals.
- CHILDREN: Yes, we will ---

- BUDDY: I "peeked," ours is about machines.
- JIMMY: I looked, ours is about W O R K.
- GRETCHEN: Our teacher said we were going to skip over the next part of our book, and take something else first - so I don't know what ours will be.
- MOLLY: Whatever any of you have next week, it is time for us to go now. So say good-bye, all of you.
- (MUSIC: IN ... UNDER ... THE GOOD-EYE'S ... UP ... FULL)

¹Robert Hegner; Parade of the Animal Kingdom (New York: The Macmillan Company, 1935), p. 422.

Teacher References

I. "General Science"

Hegner, op. cit.,

- "A wasp captures a caterpillar," p. 232.
- "A Chamelion finds its dinner," p. 320
- "An Albatross on the hunt," p. 384
- "The garden spider weaves its web," p. 118
- "The Ant Lion stalks its Prey, p. 144.

II. "Molly Myth"

No specific references for this program. It is presumed that the interest will be motivated toward "true" stories by the General having told the story this week. If the children's interest indicate, previous references may be checked for stories in whatever direction the interest leads.

III. Follow-up Suggestions.

A. Dramatics.

1. "Bird's Nest," from Little Dramas for Primary Grades by A. M. Skinner and L. M. Lawrence. American Book Company, New York. (Grades 1-2)

2. "Goats in the Turnip Field," from The Child Lore Dramatic Playlet by C. T. Byrce, Charles Scribner's Sons, New York. (Grades 1-2).
3. "Mable and the Green Lizard," from Little Dramas - ante. (Grades 2-3).

B. Nature Reading Club.

(Teacher to children)

1. Animal Families by Ann Weil. Greenberg Publishers, Inc., New York, 1946.
2. Cattail House (animal homes and feeding) by Phoebe Erickson. Children's Press, Chicago, 1949.

(Children's Reading)

3. The Alphabet of Birds, Bugs, and Beasts by Henry B. Kane. Houghton Mifflin Company, Boston, 1938 (Grade 1)
4. A Picture Book of Nature by G. C. Proctor et al. Garden City Publishing Company, Garden City, New York, 1943 (Grades 1-2)
5. Garden Creatures by Eleanor King and Welmer Pessels. Harper and Brothers, New York, 1939. (Grades 2-3).
6. Ruby Throat by Robert M. McClung. William Morrow and Company, New York, 1950. (Grades 1-2-3).
7. Time to Eat by Marion V. Ridgway and Marjorie Thomas. Howell, Soskin, Publishers, Inc., 1945 (Grade 3).
8. The Zoo Book by Dena Humphreys, Henry Holt and Company, 1947. (Grades 1-2-3).

C. Group Experiences.

1. Continuation of Personal Projects. Urge any child who has begun a worthwhile project to pursue it on his own even while other units of study are being taken up in the class. Parents who take pride in their children's accomplishments may be counted upon to help the teacher in the task of furnishing aid and material in these developing hobbies.
2. Garrison, op. cit., "Experiences with Animal life," pp. 9-43.

This concludes the programs covering the first science unit. Those for the second science unit are presented in Chapter III.

CHAPTER III

PROGRAMS COVERING THE SECOND SCIENCE UNIT

The programs presented in this chapter are designated as "covering the second science unit." This is literally true for the units in Look and Learn and in All Around Us. But the "second science unit" of this Project is the fourth unit in How Do We Know?. The order of the units of study for Primary III are rearranged for the purpose of unifying the science concepts with those of Primary I and Primary II in this coordinating activity for the three primary levels.

A brief review of the concept content of these units as they are listed in the teacher's guidebook for each of the texts will reveal that this is scientifically sound under the heading given the unit study for this Project, Energy. These concepts, quoted from the guidebooks, are:

"Unit 2, Machines, (Primary I)

- A. A machine is any implement or device that aids in doing work.
- B. Electricity is a source of power."¹

"Unit 2, Getting Work Done, (Primary II)

- A. When things are moved, work is done.
- B. We can move things with our own muscles.
- C. We can use machines that we operate with our own muscles.

¹Guidebook for Look and Learn, p. 21

- D. We can move things with animals.
- E. We can move things with machines that have engines and motors."¹

"Unit 4, Wheels and Levers, (Primary III)

- A. Wheels and axles are used in various ways to make work easy.
- B. The lever reduces the force needed to lift objects and thus makes work easy."²

At the primary level, of course, the scientist's meaning of the term energy is not fully developed, but in its broadest sense energy is "the capacity to do work." This meaning is certainly developed in the picture pages of all three of the units here combined under that title. Moreover, many of the words, such as work, power, force, and electricity, used in an adult's discussion of energy are used during the course of studying the units as they are presented in the texts on which the Project is based. Such words are used by the teacher in presenting the work, and so used that their meaning is within the vocabulary of the primary child. So it may be safely said that the rearrangement of units and the renaming of the combination is sound and acceptable from a scientific viewpoint.

On the primary level, it is advisable and customary, when introducing a new area of learning, to progress slowly until the basic learning process has been well understood through as many examples, demonstrations and first-hand

¹Guidebook for All Around Us, p. 25.

²Guidebook for How Do We Know? p. 60.

experiences as possible. Hence the comparatively longer time spent on fewer numbers of pages at the beginning of a new unit than after it is well under way. The same principle is involved in the fewer number of lessons per week for Primary I than those for Primary III. Primary II usually varies between these two in the amount of work covered weekly. As has already been noted, the scheduling of material from the texts to the programs of this Project is in approximation only. In actuality, it is based on lesson plans of the rate of progress in the primary classes of the writer's school for the 1952-53 school year.

In this unit, only one program is presented in radio script form, No. 14, to illustrate the typical broadcast for the unit on Energy. The four programs preceding it (10, 11, 12, 13) and the four programs following it (15, 16, 17, 18) appear in summary content form. The program pattern and characteristic function of the cast members, summarized in Chapter II,¹ will aid in projecting the summarized presentations into complete radio scripts for the reader.

Content Summary of Program No. 10.

The program is designed to introduce the second unit of science study and to cover the concepts and topics presented through page twenty-six of Look and Learn, page thirty-one of All Around Us, and page seventy-five of the unit in How Do We Know? being used in this Project.

Supra, pp. 48-49.

The contributions of the script characters are, in summary: Buddy - a machine is something we use for work or for fun, and we run them without our own hands or they are run by electricity (i. e., clarifying the term machine, and presenting the convenience of electricity as a source of energy for lighting and running home appliances). His guess for the topic of the week is "electric toys." Jimmy - the story he did in "language period" (the writing-spelling-using-words area of his class work) about "Pulling a Car Out of a Muddy Rut" (i. e., work is done when things are moved, and different types of forces and machines get things done). His guess for the topic of the week is "racing cars." Gretchen - things that are "round all over, like balls," roll in any direction but things that are "round only on some of their sides, like drinking glasses and wheels," roll only backward and forward (leaves this conception, for the terms spherical, cylindric, and circular are too advanced for the primary vocabulary and the properties are correctly expressed). Her guess for the topic of the week is "train wheel." The General - enriches and extends all three of the children's contribution by tying Budd's "machines for work and play," Jimmy's "stuck in the mud story," and Gretchen's "train wheels guess" together in a generalization of how machines and the forces that operate them not only work for us and give us pleasure, but also serve vital transportation needs. Molly - tells a story of "a machine that didn't work"

from the Greek myth of Daedalus and his wax wings.

 Bulfinch, op. cit., p. 160-161.

Content Summary of Program No. 11.

The program is designed to follow completion of page twenty-seven of Look and Learn, page thirty-two of All Around Us, and page seventy-seven of How Do We Know?.

The contributions of the script characters are, in summary: Euddy - machines we can connect with cords to get electricity for running them do faster and better work than machines we run with our own muscles do (i. e., electric powered machines do work faster, with less effort, and better than we can do it, usually, "by-hand" or hand-operated tools). He brings for examining comments two posters his class has made during the week, one labeled "These make Mother's work easy," and the other headed "These make our home pleasant." The magazine cut-outs are of practical and luxury electric appliances. These are his guess for the topic of the week. Jimmy - we push and pull things we want to move with the muscles we have in our hands, arms, and legs (i. e., human muscles do the work of pushing and pulling weight). He brings a mural strip-drawing his class did in "art period" of circus scenes showing how many different ways muscles are used by the circus personnel both in behind-the-scenes work and in performance. His guess for the topic of the week is "a big circus." Gretchen - it is easier to move things on

wheels than it is to push or pull them across flat places (i. e., wheels, turning freely, reduce the force needed to move loads). The principle of friction is not introduced as such, and is not necessary at this level for competent understanding of the process. She brings a wagon her class made from a cigar box with wooden knitting needle axles and spool wheels. This is her guess for the topic of the week. The General - unifies the contributions of all three children with "Man uses Energy to Move Things," an account progressing from man-powered movement to man-discovered sources of energy from nature. Molly - tells a story from Armenian mythology of what and "who" the sun is.²

¹Craig, op. cit., pp. 407-408.

Gray, op. cit., VII (Armenians-African Mythology) 11-52.

Content Summary of Program No. 12.

The program is designed to follow completion of page twenty-nine in Look and Learn, page thirty-four in All Around Us, and page eighty in How Do We Know?.

The contributions of the script characters are, in summary: Buddy - when electric "things" do work for us faster and better than we could do it with "our hands," we have more time and energy to do other things for fun (i. e., electricity is available for instant use at the flip of a

switch). He has one of the posters from last week, "These make our home more pleasant," with many things added, and is teased about the prominence of toys on it when his guess for the topic of the week is "a monkey that dances when you wind it." Jimmy - we can do "hard" work with our muscles, work "easier" when a machine "helps" us, and both easier and faster when animal muscles "help" the machine (i. e., motors and animal power both supply energy to run machines). He brings a story, "The Boy Who Learned How to Work Fast," that his class has written about a child first carrying rubble cleaned from his yard to the trash can by hand, then with a wheeled cart, and finally with shafts attached for a goat to pull it. This is his guess for the topic of the week, "a goat-cart." Gretchen - wheels need force, either muscle, motor, wind, or moving water, to turn (lets this stand without restatement). Her guess for the topic of the week is "a toy water-wheel." The General - demonstrates by articles he has with him principles from all three of the children's contributions, i. e., the parts for constructing a toy jointed-monkey fastened to the axle of a two wheel handle push-pull roller which he assembles while the children watch and comment as he explains principles: of a fixed axle (fastening wooden disks to stick-axle and joining monkey limbs to body part with wooden pegs); transfer of force from one part of a machine to another (fastening monkey to axle with tacks so that he somersaults over the axle when it is

twirled); muscle as motive force (moving toy by hand); wind as motive force (blowing the light constructed toy); and motor power force (producing and setting in motion manufactured duplicate of the toy). Molly - isn't sure she'll have time for a story, so, since they all seem to have their minds on toys and "playthings," how about some "poetry stories" on these things?1

The uncertain time element in this type script makes it more practical to set up the make-believe part of the broadcast in a flexible manner. Molly may read as many or as few of the following selections from Robert Lewis Stevenson's "A Child's Garden of Verses" as needed: "The Land of the Counterpane," "Marching," "The Unseen Playmate," "Picture-Books in Winter," "The Land of Story-Book," and "Armies in the Fire." The Complete Poems of Robert Louis Stevenson (New York: Charles Scribner's Sons, 1923), pp. 14, 18, 33-35, 36, 38-40.

Content Summary of Program No. 13.

The program is designed to follow the completion of page thirty in Look and Learn, page thirty-five in All Around Us, and page eighty-three in How Do We Know?

The contributions of the script characters are, in summary: Buddy - a wheel is a machine that makes work easier for us by helping to move things (needs no restatement); His guess for the topic of the week is "a rubber-tired wagon." Jimmy - motors and engines run by electricity or gasoline can do heavier work than animals or men and can do it faster (needs no restatement). His guess for the topic of the week

is "A Diesel Engine." Gretchen - one wheel can turn other wheels (i. e., the transfer of force from one wheel to others by means of belts and cogwheels). Her guess for the topic of the week is "a toy clothes wringer." The General - extends Buddy's contribution with examples of other "simple things that are machines" (i. e., a board as an inclined plane, a stick as a lever, and a spool and string as a pulley); enriches Jimmy's topic with a brief and simple comparison of gasoline and diesel engines; and illustrates Gretchen's subject with a brief demonstration of the interlocking mechanism of cogwheels from viewing a clock with the back off and describing it as the children watch and comment. Molly - tells the story of "a hand-machine that got lost."¹

Abbie Farwell Brown, In the Days of Giants (Boston: Houghton Mifflin Company, 1902), pp. 110-131. An adaptation from "The Quest of the Hammer."

Radio Script for Program No. 14.

The program is designed to follow completion of page thirty-two in Look and Learn, page thirty-seven in All Around Us, and page eighty-five in How Do We Know?

The science concepts touched upon are: (a) wheels make work easier (b) some machines help us do work easily and rapidly, (c) different types of force may be used to do the same work, (d) the pulley is a kind of wheel, (e) the pulley

exerts force in moving an object from one place to another.

It is suggested that the teachers have a typewriter and a clock in the room where the listening children can see them. During the script explanation of the clock hands, an adult should manipulate the clock to demonstrate the points being made. A geared wooden "dummy" model is actually better for this type of demonstration than a real clock, because such models are available in large sizes without the encumbering weight of the clock mechanism in an actual clock of comparable size. However, any clock deemed sufficiently large to be well seen by the group and light enough to be handled by the demonstrator will do. Individual observation of a typewriter will hardly be possible during the broadcast but the carriage demonstration can be accomplished then. Both machines can be fully examined and observed by the group after the broadcast. This can be a follow-up activity for the program. These and the usual references follow the script.

(MUSIC: IN ... UP ... UNDER)

GRETCHEN: Hello, again. Our Science Club of the Air is
here again, with Gretchen ---

(MUSIC: THEME REPEAT ... UP ... OUT UNDER)

JIMMY: --- Jimmy ---

(MUSIC: TREME REPEAT ... UP ... OUT UNDER)

BUDDY: --- and Buddy ---

(MUSIC: THEME REPEAT ... UP ... OUT UNDER)

GENERAL: --- "General Science" ---

(MUSIC: THEME REPEAT ... UP ... OUT UNDER)

MOLLY: --- and "Molly Myth."

(MUSIC: IN ... SWELL ... OUT UNDER)

CHILDREN: For and "inspection" by the General!

MOLLY: What's this?

GENERAL: (Chuckling) I told the children I thought I'd see just how much they did know about machines, work, and wheels this week, ---

GRETCHEN: --- and Jimmy said that would be like "getting inspected by the General" ---

JIMMY: Well, that's what they do in a real army when the men are all lined up in a row and ---

BUDDY: They just get "looked at," don't they?

MOLLY: You are right, Buddy. "Inspect" does mean "to look at."

GRETCHEN: Then I guess the General is going to "look at" what we know about machines, work, and wheels!

JIMMY: (Pleased) Yes! That's it!

BUDDY: (Seriously) How can he look at "what we know?" That's in our heads - isn't it? (LAUGHTER)

GENERAL: (still chuckling) Things we do or say show what is in our heads, Buddy.

MOLLY: And the General will just -- well, "look" at what you say -- "with his ears!"

BUDDY: (Satisfied) Oh!

JIMMY: Come on, then, let's get started! I'll be the "top" sargeant. A-ten-tion! Line up for inspection!

GRETCHEN: Oh! I don't think I want to be -- uh, "inspected" like that!

GENERAL: And there's really no need for it. We'll just have our club-of-the-air visit as we usually do, except perhaps what you tell me, or rather when you tell it, will be because I ask you, today.

BUDDY: Me first, please. I've learned a lot about machines and I want to see how much I can remember.

GENERAL: All right. Now watch what I do, Buddy. (SOUND OF PEN SCRATCHING ON PAPER).

BUDDY: You are writing!

MOLLY: (OFF) Watch what I do, Buddy. (SOUND OF TYPING)

BUDDY: You are typing!

GENERAL: Isn't that "writing" too, Buddy?

BUDDY: Yes, but not the same way you were writing.

GENERAL: How did I write?

BUDDY: With a pen.

GENERAL: How did Molly write?

BUDDY: With a typewriter.

GENERAL: Could either of us "write" without the pen or the typewriter?

BUDDY: No-ooo.

GENERAL: Is "writing" work?

JIMMY: Yes! "Work" is getting things done, and we get things done when we write - stories!

BUDDY: Yes!

GENERAL: Now Jimmy, Molly and I are each going to take a copy of the story your class wrote of "The Boy Who Learned to Work Fast," and write copies of it in the two ways we were using to write, a pen and a typewriter. You "time" us. Here's a clock with a little red second hand on it. (CLOCK TICK IN, UNDER)

JIMMY: I can tell time, but only on clocks with two hands, one for minutes and one for hours. What's this "new" hand for? (Asking for repetition).

GRETCHEN: Seconds! We had that in our "numbers stories" - I know how to count seconds by it, I'll help you, Jimmy.

JIMMY: Thanks. Then I'll know, next time.

GRETCHEN: This little red hand moves around the clock face faster than the minute hand, even. Just like the minute hand moves all the way around the circle while the hour hand gets only from one number to the next, that same way this little red second hand gets all the way around the circle while the

(MORE)

minute hand is moving from one of these little black marks to the next one where there is a number.

JIMMY: (Doubtfully) You'd better help me watch it, this time anyway, Gretchen. I might not remember well enough this first time.

GRETCHEN: I will. It'll be fun.

BUDDY: This will be like a race!

GENERAL: Yes. Would you like to be "score keeper," Buddy?

BUDDY: Will it be a "game," like baseball, where I can mark down "runs?"

MOLLY: (STILL OFF) You can "score" the number of seconds it takes each of us, Buddy.

GENERAL: That's right, Here, take this piece of paper and pencil, and sit down there by Jimmy and Gretchen. How far can you write your numbers now?

BUDDY: (OVER SOUNDS OF SETTLING) Oh, up to one hundred, I think!

GRETCHEN: (SCOTTO VOICE, CLOSE IN) I'll help you, if you need help, Buddy.

BUDDY: (SAME TONE AND MANNER) Thanks!

MOLLY: (OFF) Are we about ready?

GENERAL: Yes, I think we are all set now, with a time and a score keeper, So Gretchen, you be the "starter." When you tell us to "go," we'll begin.

GRETCHEN: All right. Are you both ready?

MOLLY: (OFF) I am.

GENERAL: (IN: CLOSE) And I am, too.

GRETCHEN: Then you're "on your mark," "get set," "GO!"
(BACKGROUND OF TYPING, CLOSE IN SOUND OF PEN
SCRATCHING ON PAPER ... HOLD FOR 45 SECONDS.
TYPING CEASES, PEN SCRATCHING CONTINUES UNDER)

MOLLY: Where is the second hand, Jimmy?

JIMMY: It's on 9!

GRETCHEN: Don't write "9" Buddy, wait! That means ---
(COUNTING RAPIDLY) 5 - 10 - 15 - 20 - 25 - 30 -
35 - 40 - 45! Forty-five seconds. Write down
"four-five" together, Buddy. (PEN SCRATCHING
STOPS)

GENERAL: I give up! I'm only about one-third through!

BUDDY: Then Molly wins!!

JIMMY: (Defensively) Sure! Anybody can write faster on
a typewriter than someone else can with a pen!

GENERAL: (VOICE FADING OFF AND BACK IN DURING FOLLOWING)
That's right, of course, Jimmy. Let's bring the
typewriter over here and look at it for a minute.
(SOUNDS OF CROWDING AROUND)

GRETCHEN: We have a little typewriter at home.

JIMMY: My Daddy has big ones like this in his office.

BUDDY: Mine, too. The nurse in his office runs it.

GENERAL: Let's look at this one, for a minute. Gretchen, look at it closely. Now tell me how many "round" parts, or wheels you find.

GRETCHEN: (DEEP BREATH) Here are three little wheels on this bar that holds the paper down -- a "long, round" thing like a rollin-pin is long and round -- that pulls the paper in, -- and two little wheels on each end of that, to move it around with -- and -- uh --

JIMMY: (WITH SOUND OF CARRIAGE HAVING BEEN SHIFTED) And here's one back here with a little belt around it going somewhere inside that I can't see ---

MOLLY: Yes, that moves the carriage across as the keys are struck, and brings it back to the other side again when you work this handle or press this little lever.

BUDDY: What's the "carriage?"

GENERAL: All this part of the machine (SOUND OF CARRIAGE AGAIN, UNDER) that moves across and back with the roller holding the paper, Buddy.

JIMMY: Gee! I never knew a typewriter had so many moving parts to it!

GRETCHEN: It wouldn't work without wheels and round parts, would it?

GENERAL: No, and wheels or parts that are rounded play a

(MORE)

big part in making many types of machines work.

MOLLY: If this "inspection" isn't over soon, I won't have time to tell a story.

CHILDREN: (Apprehensively) Oooh!

GENERAL: Then let's say that it is over, ---

BUDDY: Did you see "with your ears" what's "in my head," General?

GENERAL: (Chuckling) Yours and Jimmy's and Gretchen's. You know that machines are any "thing" that helps us do work, Jimmy knows we can use machines that we operate with our own muscles to get work done, and Gretchen knows that wheels are used in many ways to make work easy.

GRETCHEN: My! You really did "look at" "what we know" about machines, work, and wheels!

JIMMY: And we all "passed our inspection!"

BUDDY: Yes. So now can we hear Molly's story?

GENERAL: You surely may. And I'm anxious to see what "make-believe" story she could possibly know about machines, work, or wheels.

MOLLY: Well, I know one, though it may not be as useful as the things you've talked about in getting work done. But, as Buddy told us one week, "things we run with electricity get work done faster than doing the same thing with our hands,

(MORE)

and leave us more time than for "things that are fun."

GRETCHEN: And your story will be "fun!"

JIMMY: They always are!

GENERAL: (Chuckling) You win, Molly, go ahead.

BUDDY: Yes, please begin. What's the story about?

GRETCHEN: About machines, and work, and wheels, Buddy.
She said so.

JIMMY: What's the name of it?

MOLLY: It's called "The Spinning Wheel of Stars."¹

BUDDY: Spinning wheels are machines!

JIMMY: Yes, and you do work with them.

GRETCHEN: You weave things on them, like spiders do their webs. And even the name of it has the word "wheel" in it!

MOLLY: (Playfully) So there, General!

GENERAL: (Chuckling) I said, "you win" - and you's better begin, before Buddy "bursts" with curiosity!

(GENERAL LAUGHTER)

MOLLY: (Still laughing) All right. I shall begin. In one turn of the second hand of the clock! (PAUSE)
In a country far across the sea, called Finland, there lived a little girl whose name was Sonya. Now, Sonya loved to watch the stars in the sky on clear, summer nights. One night, when she

(MORE)

was doing this, she noticed three great stars that seemed to shine much brighter than any of the other stars that were out that night.

"Mother," she said, "look at those three big stars. They are in a curve, like three great diamonds sparkling on the rim of a wheel."

"They are on the rim of a wheel," her mother told her, "the rim of the spinning wheel of Frigga, the beautiful sky maiden." "The spinning wheel of stars," mused Sonya, "what a lovely name for them." Some people call them the Belt of Orion," said her mother, "but I like the other name for them." "I think I do too," said Sonya. "How did they get that name, Mother?" And this is what her mother told her:

Upon a hill, far away among the clouds, there once stood a city all aglow with the brightness of gold. It was the home of the king of the sky, Odin, and his tall, beautiful queen, Frigga. Only one passage led from this city to the earth, and that was the rainbow. It was the strongest bridge ever made, though it did not look so from a distance, with all its beautiful colors making it seem so delicate. Queen Frigga loved to walk upon this strong and colorful bridge, and when she did so, you could hardly

(MORE)

see that she was there. For the wonderful colors she wore, all green and gold, or violet and rose, looked so very much like the rainbow bridge itself. There was just one other thing that Frigga really liked to do besides walk on the wonderful rainbow bridge, and that was to sit in her gold and silver palace and spin the lovely cloth from which she made her rainbow-colored robes. No spider ever spun so fine a thread as she could spin on her wonderful spinning wheel. And it was a beautiful wheel of gold, set with many precious jewels. The jewels were so bright that when the wheel was near, there was no need for any other light.

When Frigga was finished with her work of spinning fine thread, she often spent her time weaving long strips of bright colored clouds, which drifted across the sky as she finished them. Then at evening, when her spinning was done, Frigga put her jeweled spinning wheel in one of the palace windows. The jewels shone so brightly that the people on earth could see them. They called them "stars." So - when you look into the sky on certain very clear nights and see three great stars, curved as if set in the

(MORE)

rim of a wheel, you may know that you are looking at Frigga's jeweled spinning wheel, shining from her palace window.

GRETCHEN: Oh, that was a lovely story, Molly.

BUDDY: Y-es, it was nice.

JIMMY: Um-huh. Why did some people call the stars the Belt of Orion, though?

GENERAL: Perhaps sometime I'll tell you that one, Jimmy. It's about a giant.

GRETCHEN: My, I'll bet its good, too.

JIMMY: Gee, giants -- yeah!

BUDDY: But would giants have anything to do with a machine, and work, or wheels?

MOLLY: The one the General speaks of would have more to do with clubs, Buddy. His name was Orion. And the same three stars that Sonya's mother told her were the "spinning wheel of stars" are also seen by some people as "the belt" of "the giant, Orion," standing with a big club in his hand. But that will have to wait until another time, for do you see that it is time for us to go now?

GENERAL: It certainly is, so we'll just have to wait until next week for more talk of stars or belts, or wheels, work, and machines. So say good-bye, now.

BUDDY: Bye, then.

JIMMY: See you next week.
 GRETCHEN: With new things about wheels ----
 JIMMY: ---- and work ----
 BUDDY: ---- and machines.
 MOLLY: AND stories!
 GENERAL: AND facts.
 CHORUS: GOOD-BYE'S (FADING UNDER)
(MUSIC: IN ... UNDER ... UP FULL)

¹Farmer, op. cit., p. 155.

Teacher References

I. "General Science"

Discovering Our World, Book Two.

"How Do Machines Help Us Do Our Work?"
 with sections on
 "What is a machine?" and
 "How does the wheel and axle help us?"
 pp. 69-102, passim.

II. "Molly Myth"

Lum, Peter. The Stars in Our Heaven. (Myths and
 Fables) Pantheon Books, Inc., New York, 1949.
 "Orion: The Giant Warrior," pp. 204-213.
 (Many other, similar ones, passim).

III. Follow-up Suggestions.

A. Dramatics:

1. "Man Who Read the Stars," from Classroom Plays from Canadian History by A. M. Stephen, J. M. Dent and Sons, Ltd., Toronto, Canada.
2. "Stars of Destiny," from The Cavalcade of America by D. R. Fox and A. M. Schlesinger. Milton Bradley Company, Springfield, Mass. (Both of these plays are intermediate level, but can be simplified and adapted to the primary level).

B. Nature Reading Club

(Teacher to children)

1. Exploring the Upper Atmospheres by Dorothy Fisk. Oxford University Press, New York, 1934.

(Children's Reading)

2. Science Stories, Book One.
 "The Sky at Night," p. 131;
 "The Star Dipper," p. 136.
3. Science Stories, Book Two.
 "Star Stories," p. 135;
 "The North Star," p. 138;
 "The Milky Way," p. 139.
4. Science Stories, Book Three:
 "Using Muscles to Do Work," pp. 210-215;
 "Getting Help for Muscles," pp. 216-217;
 "Using Engines to Do Work," pp. 230-235.

C. Group Activities.

1. Clock Examination suggested on the broadcast: An "old" clock, still in working order, is fascinating to the primary child. The possibilities both for mechanism observation and time-telling skill are varied. The individual teacher can more easily make plans from here to suit her own group interests and abilities.
2. Typewriter and other machine examinations: There are numerous suggestions in each of the guidebooks for bringing machines to the classroom to be observed and experimented. There may be many offers from individual children to bring such machines.
3. Field Trips: This is an excellent time for the traditional primary excursions to the fire station, bakery, or any place where machines in operation may be safely observed.

Content Summary of Program No. 15.

The program is designed to follow completion of page thirty-three in Look and Learn, page thirty-nine in All Around Us, and page eighty-seven in How Do We Know?.

The contributions of the script characters are, in summary: Buddy - machines can't "work themselves," muscles or motors make them "go" (i. e., machines with engines have greater power than most machines without engines). His guess for the topic of the week is "an ocean liner." Jimmy - when machines "work for man," they save his energy and have more power than animals or man (needs no restatement, let stand). His guess for the topic of the week is "an airplane."

Gretchen - a lever is a machine that makes it easier to lift heavy things, like wheels make it easier to move heavy things (let stand). Her guess for the topic of the week is "anything to be lifted." The General - extends Buddy's contribution with an additional power source, water; illustrates Jimmy's contribution with ways man cares for the machines that "work for him;" and enriches Gretchen's contribution with additional simple examples of how the lever helps us lift things (seesaw, pump handle, prizing up a box lid). Molly - tells a simplified condensation of "John Henry and the Machine in West Virginia."¹

Milton Rugoff, (ed.) A Harvest of World Folk Tales
 (New York: The Viking Press, 1949), pp. 85-91.

Content Summary of Program No. 16.

The program is designed to follow completion of page

thirty-five in Look and Learn, page forty in All Around Us, and page ninety in How Do We Know?. The concepts are left now as they are presented by the children. They have become more competent in stating what they have learned, so the procedure of restating is no longer necessary.

The contributions of the script characters are, in summary: Buddy - there are many different kinds of machines that do many different kinds of work. His guess for the topic of the week is "a steam shovel." Jimmy - reviewing the concepts of his unit: work is done when things are moved, and things are moved by human and animal muscles, and by machines with engines and motors. He makes no guess for the topic of the week because he says there was too much to know what to guess. Gretchen - a fulcrum is whatever we use to rest a lever on to do its work, and how close or how far it is from what you are lifting makes a difference in how heavy "a thing" you can lift with it. She makes no guess for the topic of the week. The General - uses Buddy's steam shovel guess to lead each of the children into demonstrating their own contributions from a toy model. Molly - a story about "a rock that only lightning could move."¹

Katharine Berry Judson, (ed.) Myths and Legends of British North America (Chicago: A. C. McClurg and Company, 1917). pp. 180-182, "Wolverine and Rock."

Content Summary of Program No. 17.

The program is designed to follow completion of page thirty-seven in Look and Learn, and page ninety-three of How Do We Know?. Primary II will have completed their unit on "Getting Work Done" before last week's program, and is presumed to have spent the week before this program in reviewing the concepts of the entire unit and in completing their project that may have been under way during the study of the unit. As the next to the last program of the unit, it is "personal project" presentation time, with no need therefore for using the "Guess-box."

The contributions of the script characters are, in summary:- Buddy - we have to use our "head" to decide what machines to use, and the best way to use them. He did not have a personal project during this unit. He says he "had so much to do" on the class project, which he is going to bring next week, to have time for one "by myself." Jimmy - presents and describes his personal project. He has made a "Big Book of Real Tow Cars," modeled on George J. Zaffo's series,¹ in which he has collected all the pictures he could find of tow cars, and drawn his own pictures of the parts (i. e., cable, winch, pulley arrangements, warning blinker lights, night spotlights, various tools) and labeled these parts with an attempt to write a text of their purpose and value. Gretchen - reviewing major concepts of her unit on

Wheel and Levers, i. e., that wheels and axles make work easy for us in many ways, and that levers make work easy by lifting heavier things than we could lift with our own muscles. She presents her personal project. She has made, as each child in her class has also, a "Story Book of How We Use Wheels and Levers" with magazine picture cut-outs and a brief explanatory text on where the wheel or lever is in the pictured object. Some of the objects pictured are brought out in descriptive conversation of the group, such as a clothes line labeled "pulley wheels," a pencil sharpener labeled "wheel and axle," and a seesaw labeled "lever." The General - leads the children to express unit concepts whenever possible during their presentations and assists them otherwise by lead questions that will bring out clear descriptions of the projects for the listening children. Molly tells the story of "the sun on wheels."²

¹The Big Book of Real Fire Engines (New York: Grosset and Dunlop, 1950). Any one of the others would have done as well.

²Amy Cruse, The Young Folk's Book of Myths (Boston: Little, Brown, and Company, 1937), pp. 29-37, the Greek myth of "Phaeton and the Fiery Steeds."

Content Summary of Program No. 18.

The program is designed to complete the unit on Energy and has the general character of all unit-concluding

programs, exemplified by Program No. 9 in Chapter II.

Primary I will have completed page thirty-eight in Look and Learn, and will have spent the week preceding this program reviewing and completing unit projects. Primary II completed their unit and review before last week's broadcast, so it is presumed that they will have spent the week before this program on project completions. Primary III completed their unit study before last week's broadcast, so will have spent the week preceding this program in reviewing concepts of the unit and working on individual or class projects.

The contributions of the script characters are, in summary: Report of their class project by each of the script children. Buddy brings a miniature play-house which his class constructed and have filled with magazine pictures of "electric machines we use in our homes" pasted to cardboard backing. They have made "back bracings" to make them stand up and "look like real things." This is what he was so busy with that he had not time for a project "by himself." Jimmy has a set of three big posters his class made, the first one headed "Non-motor Machines We Use" (scissors, broom, saw, etc.) the second, "Work Animals Do With Their Muscles" (pull wagons, farm implements, etc.) and the third, "Machines Run By Motors or Engines." (cars, trains, airplanes, etc.). They are large display size posters, made of course from magazine picture cut-outs, which he says they will "hang on the walls in the

auditorium." Gretchen's class has made a "book" which they hope to continue through the intermediate grades because the teacher has said that they will learn "big names of just one word for the pictured things they have grouped in each of the sections. The sections each have a title page bearing these captions and brief identifying characteristics: (the parenthetical generic term is not in their book - yet)

Section I - "Things Like Balls. They are round all over. They roll in any direction." (Spheres). Section II - "Things Like Rolling-Pins. They are round on the sides. They roll only backward and forward." (Cylinders). Section III - "Things Like Wheels. They are round on the edges. They roll only backward or forward." (Circles). The General tells the "story" this week, "Our Biggest, Hardest Working Machine Is A Ball."¹ Molly contributes only dialogue leads for script pacing.

¹Craig, op. cit., pp. 81-84. Based on facts from "The Earth Is Our Planet."

This concludes the programs covering the second science unit. Those for the third science unit are presented in Chapter IV.

CHAPTER IV

PROGRAMS COVERING THE THIRD SCIENCE UNIT

Of the two remaining units on each of the primary levels still to be covered in this Project, one is the same in both content and, virtually, in name - Plants. This is Unit 3 for the third primary level, but it is Unit 4 for both the first and the second primary level. It is therefore better to leave that unit in the order in which it comes for the two lower levels. This leaves Unit 2, "Land and Water," of Primary III to be combined with "Days and Days" in Primary I and "Sun, Wind, and Weather," in Primary II. The latter two could easily be combined under the unit title "Weather," as the presentation of general concepts for the units, below, bears out. But all three of the levels cannot be combined under a single title. Therefore, the third science unit of this coordinating Project is renamed "Earth's Surface and Weather."

A review of the general concepts for the units being combined will also reveal that a coordinating activity will not be as easily accomplished as it was under the two preceding units of study for the series. Whether it has been accomplished successfully and profitably for the purposes of the Project, as they are set forth in Chapter I, will rest with the examiner after the programs to follow have

been set before him.

A review of the general science concepts of the three participating levels will exemplify the above statements and give a comprehensive view of what may be expected in this unit. They will also serve as criteria in judging the scientific validity of the unit combination made for this coordinating activity and the title given the combined unit, "Earth's Surface and Weather." Quoted from the guidebooks for each of the texts, these concepts are:

"Unit 3, Days and Days, (Primary I)

- A. There are many kinds of weather.
- B. Seasons have characteristic weather conditions.
- C. People adjust their activities and clothing to changes in weather and season."¹

"Unit 3, Sun, Wind, and Weather, (Primary II)

- A. There are many kinds of weather.
- B. The sun appears to rise in the morning, describe an arc overhead, and set in the evening.
- C. The sun gives us light and heat.
- D. Temperature is an important factor in determining what the weather will be and thus affects our daily activities.
- E. The wind has force."²

"Unit 2, Land and Water, (Primary III)

- A. The land areas of the earth's surface vary in physical characteristics.
- B. The water areas of the earth's surface vary in form and size.
- C. Land and water areas are utilized in various ways."³

¹Guidebook for Look and Learn, p. 28.

²Guidebook for All Around Us, p. 32.

³Guidebook for How Do We Know?, p. 36.

The first four programs of the unit (19, 20, 21, 22) appear in content summary form. Program No. 23 appears in radio script form, exemplifying the typical broadcast for the unit. The last four programs (24, 25, 26, 27) appear in content summary form.

Content Summary of Program No. 19.

The program is designed to introduce the unit and to follow completion of page forty in Look and Learn, page forty-three in All Around Us, and page thirty-nine in How Do We Know?.

The contributions of the script characters are, in summary: Buddy - every day may be a different kind of weather, and we must do only things that are "good to do" and wear the kind of clothes that are "right to wear" for "sunny, rainy, or windy" days when they come. His guess for the topic of the week is "a fishing trip." Jimmy - "weather" is sunshine, "wetness," (we learn that he means by this dew, fog, rain, snow) wind, or "stillness." His guess for the topic of the week is "a storm." Gretchen - the two main kinds of "things" the earth is made of are land and water, and plain means a flat kind of land while stream, pond, and lake are all different kinds of places where water is found. Her guess for the topic of the week is "a picnic in the woods." The General - establishes a unifying idea for the three contributions, and thereby for the combination of their individual units into that of the

coordinating activity, by showing that Buddy's and Jimmy's units are really the "third part" of the earth to add to the "two parts" Gretchen's class is studying.¹ Molly tells the Cree legend of "How the Earth was Formed."²

¹Craig, op. cit., pp. 85-94 "The Three Parts of the Earth," passim.

Judson, op. cit., pp. 12-14.

Content Summary of Program No. 20.

The program is designed to follow completion of page forty-one in Look and Learn, page forty-five in All Around Us, and page forty-one in How Do We Know?

The contributions of the script characters are, in summary: Buddy - we can tell what kind of weather is coming by looking at the sky. His guess for the topic of the week is "a rainbow." Jimmy - the sun "makes night and day" and also divides the day "into parts." His guess for the topic of the week is "a stormy night." Gretchen - valley means a "low kind of land between high kinds of land;" hills and mountains are the "high kinds." Her guess for the topic of the week is "mountain streams." The General - extends Buddy's contribution with simplified explanations of how the "weather man" tells what kind of weather is coming;¹ enriches Jimmy's contribution with an answer to "why do we have daylight and

darkness;"² and ties Gretchen's contribution to the boys' with simple statements about the forces that raise and lower the land.³ Molly - a myth of the Hindus, "a story with a storm, big streams, but a bridge instead of a rainbow in it."⁴

¹ Wilbur L. Beauchamp, et al, Discovering Our World, Book Two (Chicago: Scott, Foresman and Company, 1938), pp. 158-162. Reference to this source hereafter will be by title only.

² Wilbur L. Beauchamp, et al, Discovering Our World, Book One (Chicago: Scott, Foresman and Company, 1937), pp. 156-159. Reference to this source hereafter will be by title only.

³ Craig, op. cit., pp. 111-114, "Weather Changes the Earth's Surface."

⁴ Cruse, op. cit., pp. 217-221. An adaptation from "The Story of Rama," "Adams's Bridge."

Content Summary of Program No. 21.

The program is designed to follow completion of page forty-three in Look and Learn, page forty-seven in All Around Us, and page forty-three in How Do We Know?

The contributions of the script characters are, in summary: Buddy - dark clouds on warm days may mean "rain" but in some places on winter days they may mean "snow," and we need different kinds of clothes for these different kinds of days. His guess for the topic of the week is "a big snowman." Jimmy - heat comes from the sun, clouds sometimes

"cut off some of the heat," and where your shadow is can tell you what time of the day it is. His guess for the topic of the week is "a sundial." Gretchen - there are different kinds of "flat kinds of land (plains) in different parts of the earth. Her guess for the topic of the week is "a desert." The General - extends Buddy's contribution from "What makes it rain and snow?"¹ enriches Jimmy's contribution with "How is the earth a clock?"² and ties Gretchen's topic to weather with some facts on "what makes a desert."³ Molly - a story that asks, "does your shadow belong to you?"⁴

¹Discovering Our World, Book Two, pp. 152-157.

²Discovering Our World, Book One, pp. 160-163.

³Craig, op. cit., "Water in the Air," p. 93; "Wind Abrasion," p. 129; and "Climate and Weather," p. 227.

⁴Rugoff, op. cit., p. 421: "The Ass's Shadow," from Aesop's Fables.

Content Summary of Program No. 22.

The program is designed to follow completion of page forty-five in Look and Learn, page fifty-one in All Around Us, and page forty-six in How Do We Know?.

The contributions of the script characters are, in summary: Buddy - sunny-days, windy-days, and cloudy-days

can all be cold, cool, or warm, too. His guess for the topic of the week is "a warm sunny-day." Jimmy - the sun can also tell "what time of year it is," and we can measure the heat the sun is giving us with a thermometer that "goes up for hot and comes down for cold." His guess for the topic of the week is "the red stuff inside of a thermometer." Gretchen - swamps are lakes or ponds "without much water" and a stream has many names. Her guess for the topic of the week is "The Everglades." The General - extends Buddy's and Jimmy's contributions with facts about the sun's effect on days and years,¹ and relates Gretchen's topic to the earth's surface.² Molly - the story of "a shelter from rain and sun."³

¹Discovering Our World, Book One, "Why are summer days warmer than winter days?", p. 168-172; and "What makes a year?" p. 164-165.

²Discovering Our World, Book Two, "How does water change the surface of the earth?" pp. 174-181.

³F. H. Lee, Folk Tales of All Nations (New York: Tudor Publishing Company, 1930), pp. 790-792 "The Mud People."

Radio Script for Program No. 23.

The program is scheduled to follow completion of page forty-seven in Look and Learn, page fifty-four in All Around Us, and page forty-eight in How Do We Know?

The science concepts touched upon in the program are: (a) weather varies from day to day within a month; (b) the wind has force; (c) thermometer indications control the clothing we wear, the heat of our homes, and the care of growing things; (d) small streams run together to form larger bodies of water such as rivers, and (e) water flows toward the lowest point of outlet, with the rate of flow controlled by the height of the slope.

It is suggested that whatever the participating groups may have done so far in this unit in the way of "weather station" activities be on view at the time of the broadcast. Particularly would it be of value to have an anemometer, or better yet, a simplified model of one, on view during the discussion of this instrument by the script characters. Any dial that will register speed would also be a useful demonstration article for this broadcast. If Primary III has made any sand-table models of land and water arrangements, particularly one which demonstrates the characteristics and direction of flow of water, this also should be displayed during the listening time for this program.

The usual references and suggestions follow the radio script.

(MUSIC: THEME IN ... UP ... UNDER)

GRETCHEN: Hel-lo! Your Science Club of the Air is now
 i-n-tes-sion!

(MUSIC: REPEAT THEME ... UP ... UNDER)

JIMMY: In what?

(MUSIC: REPEAT THEME ... UP ... UNDER)

BUDDY: Yeah, in what?

GENERAL: (Chuckling) Don't let her fool you, boys.
She didn't think that up by herself.

MOLLY: We "girls" decided together on that opening
today.

GRETCHEN: Yes, I said I was tired of saying the same
thing every time we opened our club meeting, --

JIMMY: Well, what did you say today?

BUDDY: The club is in ses -- ses-something.

GENERAL: Session, Buddy. It just means that we have
started our meeting, that's all.

JIMMY: Well, gosh - why didn't she just say that.

MOLLY: Gretchen learned a new word, and why shouldn't
she use it?

JIMMY: Oh, all right. But if we have started our
meeting, what's it going to be about?

BUDDY: Yes, let's really get started, because I want
to tell the General what we did last week!

GENERAL: Then suppose you go right on and tell now.

BUDDY: Sure. We made a weather c-h-art!

JIMMY: We did that last year, too.

BUDDY: On a cal-en-dar?

GRETCHEN: Yes, we made one that way when I was in Primary I. It was lots of fun. My sister and I have kept one at home ever since.

GENERAL: What did making a weather chart on the calendar show you, Buddy?

BUDDY: Well, so far, we've got four pages to our calendar, and four blocks filled in on our chart, one for each day of the week since we started it, and they are all different.

MOLLY: How are they different, Buddy?

BUDDY: They have different pictures on them. You see, we draw sun pictures for sunny-days and cloud-pictures for cloudy days, and rain-drop pictures for rainy days, windy-pictures for windy days --

JIMMY: Yeah - one day it did rain, and the next day --

GRETCHEN: -- was still full of rain-clouds, ---

BUDDY: --- and wind! And then the sun came out.

GENERAL: So you already have all kinds of weather on your weather chart.

MOLLY: What will you do about today, Buddy? It sprinkled rain again this morning, but now the sun is out.

BUDDY: Put rain and sunshine on the same block, I guess.

JIMMY: We sure haven't had the kind of weather here

(MORE)

we've been studying about this week, except maybe the wind that one day.

GRETCHEN: Was it cold weather you studied about Jimmy?

GENERAL: We haven't had much of that here, have we.

JIMMY: No, but the people in our science book had such cold weather! The woman looked at the thermometer outside the window and right away put her little boys coat on before she's let him go outside. Then she told her husband to put more coal in their furnace.

GENERAL: Why do you suppose she did all that just from looking at the thermometer, Jimmy?

JIMMY: Because that's what we use thermometers for, to tells us whether we need warm clothes or not, or to cover up plants outside, and if its getting too hot or too cold in our houses.

BUDDY: Gee! I think I'd like to have a ther-- er--

MOLLY: Ther-mom-e-ter, Bud. Yes, they are very useful, but they don't measure how hard the wind is blowing, and you said you had that kind of weather this week in your science book, too, Jimmy.

JIMMY: Yes, we did. The children put up a play tent, and the wind came up so hard it pulled their tent pegs right out of the ground and blew the

(MORE)

tent way up in the air from over them. What would they need to know how strong the wind was, General?

GENERAL: You seemed "stumped" by the word Gretchen used to open the program today, Jimmy. And the name of what measures the "speed" of wind is a lot bigger word than that.

GRETCHEN: What is it, General?

GENERAL: It's an an-e-mom-e-ter.

JIMMY: The end of it sounds just like a thermometer. Does it work like one? or look like one?

GENERAL: No, to both questions. An anemometer is usually made of three or four little metal cups placed at the ends of an "arm," as it is called. Maybe that's because the pipe-like bar the cups are fastened to fit across the top of a larger pipe a little like our arm fits our body. But it really works more like a wind-mill, because the bar the cups are fastened to is set in the top of a larger pipe at the middle of the "arm," so that it swings around in a circle when the wind blows it just as a wind-mill does. And the faster the wind blows, the harder it pushes against these cups. That swings the arm around faster, you see.

- BUDDY: I can't tell how fast the wind is blowing just by looking at a wind-mill!
- GENERAL: No, Buddy. Nor can anyone else. But the anemometer has a meter set in the bar holding up the "wind-mill-like arm" that does tell the speed of the wind.
- JIMMY: Like a speedometer on a car?
- GENERAL: Exactly, Jimmy.
- GRETCHEN: Well I don't know anything to measure how fast water runs, but I sure learned something this week about how it runs, and why.
- MOLLY: How does it run, Gretchen, and why? I don't know what you mean.
- GRETCHEN: It runs faster when it runs down hill, or from some place up high to some lower place. We took a pan full of water and tipped it up easy as we poured it into a jar. Then we turned it up faster and that made the pan tilted up higher. The water ran really fast and quick, then.
- GENERAL: So you learned that water always flows toward the lowest point to "get out." And you also found that the higher the slope, the faster the water runs.
- GRETCHEN: Yes. And that's what makes "streams" have so many names.

BUDDY: How could that give names to streams, Gretchen?

GRETCHEN: Do you remember last week, Buddy, when I told you all about "brooks" and "creeks" and "rivers?"

JIMMY: I remember that they are all streams of water.

GRETCHEN: And that means that they are all water moving.

BUDDY: And that some are "little" and some are "big!"
I remember.

GRETCHEN: Yes. And what makes some of them little and some of them big is the way water acts - just what I've told you today - that it flows down, and the "down" places get more water then, and get to be bigger streams, and then have a different name than when they were little streams.

JIMMY: Yeah! Little ones are "brooks" and "ponds," --

BUDDY: And big ones are rivers!

GENERAL: Very good! That shows you can all think!

MOLLY: So can I! Listen: Water and wind can both be little or big ---

JIMMY: --- or fast or slow ---

BUDDY: --- or hot or cold!

GENERAL: And what makes things on earth hot or cold?

GRETCHEN: The sun! It makes 'em hot when 'it's there and cold when it's away! (GENERAL LAUGHTER)

MOLLY: Wind, water, and sun all affect our lives every day in many ways. That leaves me three things to choose from for the story today.

BUDDY: Time for Molly's story! Hurrah!

JIMMY: Which will it be, Molly?

GRETCHEN: Let it be about the sun, please. I like it best.

MOLLY: All right. Would you like to hear what the Lillooet Indians of Canada told their children about "why the sun is bright?"²

JIMMY: "Because it's a ball of fire?"

GENERAL: (Laughs joyously) This is a myth, Jimmy.

MOLLY: The little Indian boy in the story is very much like Jimmy. His name was Lillo, and he loved to roam the woods and look for plants and animals. Of course, he lived long, long ago, when Canada had another name, The Indians of his own tribe said in after years that he was the cause of the sun being so bright.

BUDDY: How! Please do tell!

MOLLY: All right. I'll begin "at the beginning."
(PAUSE) Lillo lived long, long ago, with his grandmother, alone. He had to take care of her. So he fished and trapped for their food. And Grandmother cooked, and kept the tepee neat and clean. Now Lillo brought home so many good things to eat, and was so very good to Grandmother, that she wanted to do something

(MORE)

very nice for him. So one day she said to him, "Lillo, bring home the feathers of all birds you see that are bright in color. I will make something for you from them." So Lillo searched the forest for all the bright plumaged birds he could find. They were all his friends, and when they learned what he wanted, one of them said, "I know a brother bird, deep in the forest, whose feathers are brighter than the moon. I shall bring you many feathers from his family." "My," cried Lillo, "how bright they must be! For the moon is the brightest thing on earth." Soon Grandmother had many golden feathers, so she fashioned them into a beautiful robe for Lillo. How proud he was of it! As he went through the forest, he shone brighter than the moon, and soon everyone knew the brightness that moved through the forest was little Lillo, the good hunter and fisherman.

Now Sun, as he followed the trail in Sky Land each day, began to notice the brightness in the forest. He thought, "I wonder what shines so brightly in that forest every day as I pass by. I know it isn't Moon, for he doesn't travel in the day, nor in forests." Finally, Sun could stand it no longer. He had to know

(MORE)

what the brightness was! So - one day he left the Sky Land trail and came to the forest in search of the brightness. There, at the edge of the forest pool, he saw the boy with the golden, shiny robe, standing with his spear drawn back to spear a fish. His own gray goatskin robe seemed duller than ever beside this beautiful garment. "Why that's what I need, a golden robe like this boy's! Then I would shine brighter even than Moon!" he thought. "I'll ask him to trade with me." So he came near, and spoke to Lillo. "Good morning, boy. Would you like to trade blankets with me?" Lillo looked up to see who had come to offer a trade. Indian boys just love to trade. But when he saw the plain gray robe the stranger was wearing, he answered, "Oh, no! Grandmother made my golden robe for me from the feathers of a wonderful bird family. It's much prettier than yours." "Ah, but you do not know the value of my robe," said Sun. "Look!" And he trailed the goatskin fringe through the water where Lillo had been watching for fish to spear. At once a fish caught on each tip of the fringe. Here was a whole string of fish for Grandmother!

(MORE)

When she learned of this wonderful robe that could catch so many fish for their dinner, she would be pleased! So Lillo gave his shiny robe to the stranger, and took home the wonderful robe that would catch fish. Sun wrapped the golden robe about him and rose high into the Sky Land trail again. "Now I am brighter than Moon," he said. And so he was. As bright and dazzling as he is today, because of Lillo's robe. People can no longer look at him.

GRETCHEN: You can't look at the sun when its really shining, that's true.

JIMMY: I've tried it, and got "sun spots" in my eyes, so that I could still see the brightness when I closed my eyes.

BUDDY: My Daddy says that's a silly thing for a boy to do to his eyes.

GENERAL: It isn't a very sensible thing to do.

MOLLY: Perhaps that's what Indian boys did in Lillo's tribe. And because he was the hero they already knew so many wonderful hunting and fishing stories about, gave him credit for the brightness of the sun.

BUDDY: Well I hope "Lillo's robe" comes out tomorrow, because I want to put another sunny-picture on my calendar chart.

JIMMY: I want to watch the red -- what did you tell us the "red stuff" in the thermometer is called, General?

GENERAL: Mercury, Jimmy.

JIMMY: I want to watch the mer-cu-ry go up in our classroom thermometer, so I hope "Lillo's robe shines bright tomorrow, too.

GRETCHEN: I want it to shine bright, too, so I can go swimming.

MOLLY: We'd better all go, right now. Look at the clock!

GENERAL: My, it is time to go. Say good-bye, children.

(MUSIC: STARTS UNDER THE GOOD-EYE'S ...)

GRETCHEN: Good-bye -- Be Back next week,

BUDDY: --- with sun-ny days ---

JIMMY: --- and all kinds of weather ---

GRETCHEN: --- and land, and water!

ALL: (MORE GOOD-EYE'S, FADING UNDER)

(MUSIC: IN ... UP ... FULL)

¹Craig, op. cit., p. 198.

²Judson, op. cit., p. 60

Teacher References

I. "General Science"

Discovering Our World, Book Three.

"What is happening to the soil of our country?" (wind and water erosion) pp. 406-409.

"How does the sun help us?" pp. 274-281.

II. "Molly Myth"

Farmer, op. cit., "Why the Moon Follows the Sun," pp. 87-88.

Judson, op. cit., "When Sun was Snared," pp. 62-63.

III. Follow-up Suggestions.

A. Dramatics.

1. "Lady Moon," from Little Dramas for Primary Grades by A. M. Skinner and L. M. Lawrence. American Book Company, New York. (Grades 3-4)*
2. "Mr. Sun and Mr. Wind," from New Plays for Children by A. P. Sanders. Dodd, Meade and Company, Inc., New York. (Grades 4-6)*
3. "When the Sun Rises," from The Child Lore Dramatic Playlet by C. T. Bryce. Charles Scribner's Sons, New York. (Grades 1-2)

* Any material too advanced for a group may be simplified by the individual teacher to suit the abilities of her own group.

B. Nature Reading Club.

(Teacher to children)

1. Rain Drop Splash by Alvin Tresselt. Lothrop, Lee and Shepard Company, Inc., New York, 1946.
2. Wind and Peter by Alving Tresselt. Oxford University Press, New York, 1948.

(Children's Reading)

3. Sun Up, by Alvin Tresselt. Lothrop, Lee and Shepard Company, Inc., New York, 1949.
4. Science Stories, Book One. Part 2:
"Weather," pp. 35-47.
5. Science Stories, Book Two. Part 1:
"Weather," pp. 7-40.
6. Science Stories, Book Three. Part 3:
"The Earth's Surface," pp. 143-193.

C. Group Activities.

1. Classroom Weather-Record Keeping. In whatever manner is most suitable to the level, the individual interest, and class abilities - charts, maps, or "real weather station," i. e., instruments simple enough for children to chart weather with - barometer and thermometer.
2. Field Trip. This is the ideal time to visit whatever is locally available in the way of weather recording establishments.
3. Garrison, op. cit., Part IV: "Experiences with Forces of Nature," pp. 67-95.

Content Summary of Program No. 24.

The program is designed to follow completion of page forty-nine of Look and Learn, page fifty-seven of All Around Us, and page fifty-one of How Do We Know?

The contributions of the script characters are, in summary: Buddy - we have four seasons of the year, following each other in order, each with weather all its own. His guess for the topic of the week is "summer." Jimmy - the wind blows at different speeds with "what it does" telling us how "fast and hard" it has blown, and man can use the force of wind for good or it can do harm to him. His guess for the topic of the week is "a big storm." Gretchen - review of all types of land and water, what each is like, and where they are found on the earth's surface. Her guess for the topic of the week is "snow-capped mountains." The General - enriches and extends the concepts of all three

children by relating air to the seasons, the force of wind, and the earth's surface.¹ Molly - tells the Norse myth of "Why the Sea is Salt."²

¹Discovering Our World, Book Two. "Why does the temperature change?" pp. 138-141; "What makes the wind blow?" pp. 142-147; and "How does air change the surface of the earth?" pp. 182-184.

²Rugoff, op. cit., pp. 672-676.

Content Summary of Program No. 25.

The program is designed to follow completion of page fifty-one in Look and Learn, page fifty-nine in All Around Us, and page fifty-two in How Do We Know?.

The contributions of the script characters are, in summary: Buddy - what we do and what we wear is different in each of the seasons of the year. His guess for the topic of the week is "October and Halloween." Jimmy - "wet weather" can be many different kinds and temperature tells us which kind it may be. His guess for the topic of the week is "a car skidding on ice." Gretchen:- many kinds of land and many kinds of water make up the earth's surface, and we use them in different ways for different reasons. Her guess for the topic of the week is "a volcano." The General - extends Buddy's concept with "the cause of the change of seasons,"¹ enriches Jimmy's topic with "how the different

kinds of 'wet weather' help the soil,"² and adds to Gretchen's topic with "why and when volcanoes erupt."³ Molly - tells a Filipino folk story, "The Cause of Tides,"⁴

¹Craig, op. cit., p. 58.

²Ibid., pp. 220-225, passim.

³Ibid., pp. 106-107.

⁴Farmer, op. cit., pp. 93-96.

Content Summary of Program No. 26.

The program is designed to follow completion of page fifty-two in Look and Learn and page sixty in All Around Us. Primary III completed the last pages of their unit before last week's program and will have presumably spent the week reviewing concepts and working on whatever projects have been under way during the study of the unit.

The contributions of the script characters are, in summary: Buddy - summation of his unit, we have "days and days" of all kinds of weather. His guess for the topic of the week is "my project." He brings and presents his personal project. It is an addition to his own "Growing Up" record begun in Unit 1. He has added a section called "What I Did in Each Season of the Year When I Was Six Years Old." Jimmy - reviewing the concepts of his unit, the weather, the sun, the temperature, and the wind are

"all tied up together." His personal project is a collection of stories, written in "language period" during the study of "Sun, Wind, and Weather." Gretchen - has nothing more to present in unit concept, having completed that the week before. Her personal project is a scrapbook on "Our Land and Water," with pictures and simple text about the land and water forms of her own locality. The General - unifies the contributions by leading the children to tie their project presentations to the concepts of the unit just completed. Molly acts only as dialogue builder and contributes continuity links. The personal projects were so lengthy, coupled with references to the projects of other children of their classes, there was not time for a story this week.

Content Summary of Program No. 27.

The program is designed to conclude the unit on "Earth's Surface and Weather," and to forecast the final unit of the series. It has the general character of all unit-concluding programs, exemplified by Program No. 9, in radio script form, presented in Chapter II.

The contributions of the script characters are, in summary: Each of the children bring and act as "reporters" for the project of his own class. Buddy's class has made a "Book of the Seasons." They collected magazine pictures and drew others in their "coloring period" of clothing,

games, and other activities suitable for the various types of weather of the four seasons. Toward the end of the unit, they combined the pictures into book form, divided by the seasons, with the first page of each showing a typical scene for that season. Jimmy's class has made a large size poster headed "They Won't Move Without Wind" which is a collection of magazine cut-outs of the various types of toys and equipment, ranging from pinwheels to airplanes, that depend upon the wind action for successful operation. Gretchen's class has made a sand-table model of all the various types of land and water formations they have had during the study of their unit. Construction was begun soon after the unit was begun, with formations being added week by week as they appeared in the unit study. It is portable, has been brought to the broadcast, and is described in conversation among the cast. The General tells "the story" for this unit-concluding program. He gives a short account, "personalized" but scientifically accurate, of "Life in a Brook." There are references to seasonal effects, as well as where the brook comes from and where it may go.¹ Molly again serves as "dialogue-pacer" and contributes continuity transitions.

Anna Botsford Comstock, Handbook of Nature-Study (Ithica, New York: Comstock Publishing Company, Inc., 1939), pp. 739-741, passim.

This concludes the programs covering the third science unit of the Project. Those for the fourth and final unit are presented in Chapter V.

CHAPTER V

PROGRAMS COVERING THE FOURTH SCIENCE UNIT

The units of study now remaining to be covered are the same in the area of scientific content for all three of the participating levels. The units bear the title "Plants" in the texts of the two higher levels. It is at once easily seen by the title and the general concept content of the first primary level that their unit is also on plants. That title is therefore kept as the unit title for the coordinating activity of this Project.

The general scientific concepts of the three levels are again quoted from the guidebooks of the texts as an aid to better understanding the detailed concept coverage in the following programs and as criterion for judging the value and validity of the combination.

"Unit 4, Outdoors, (Primary I)

- A. There are many kinds of plants.
- B. Plants grow and reproduce their kind.
- C. People and animals use plants in various ways."¹

"Unit 4, Plants, (Primary II)

- A. Living things have certain characteristics that distinguish them from non-living things.
- B. Plants have distinguishing features by which we can tell one plant from another.
- C. Plants grow and reproduce their kind.

Guidebook for Look and Learn, p. 35.

- D. Sufficient light and water are necessary for growth."¹

"Unit 3, Plants, (Primary III)

- A. Water, sunlight, and certain materials found in soil are necessary for plant development.
 B. Green plants manufacture their food.
 C. Plants have definite parts with distinguishing physical characteristics.
 D. Plant structures have definite functions in food-making.
 E. Plants have definite parts by which they perpetuate themselves.
 F. Plants have enemies that can destroy them or retard their growth.
 G. Plants are protected by man so that he can derive food and pleasure from them."²

With the series thus far developed, and the explanatory material of the preceding chapters in mind, the work of this final unit should need no further introduction.

The first four programs (28, 29, 30, 31) are given in content summary form. Program No. 32 is presented in radio script form as an example of the typical broadcast for the unit on Plants. The next three programs (33, 34, 35) are given in content summary form. Program No. 36 is presented in radio script form, since it is the concluding broadcast of the series, with special characteristics not previously having been illustrated.

Content Summary of Program No. 28.

The unit has been sufficiently introduced by forecast in the concluding broadcast of the third science unit.

¹Guidebook for All Around Us, p. 41.

²Guidebook for How Do We Know?, p. 45.

Therefore it is designed to follow a larger number of pages on each of the levels than the first program of any of the preceding units. Primary I will have had their introduction to the unit and have covered the material at least through page fifty-four of Look and Learn. Primary II will have been introduced to the unit and have covered the material of the text at least through page sixty-three of All Around Us. And Primary III will have had an introduction to the unit and have covered the text material at least through page fifty-five of How Do We Know?.

The contributions of the script characters are, in summary: Buddy - there are lots of different kinds of plants, and we can tell which kind they are by how big or how little they are, what color they are, and what they look like in other ways. His guess for the topic of the week is "a pine blossom." Jimmy - animals and plants are "alive," and they grow, make other things like themselves, and then die. His guess for the topic of the week is "an apple blossom." Gretchen - plants do grow if they have the things they need to make them grow. Her guess for the topic of the week is "a garden spot." The General clarifies Buddy's concepts with the words shape, size, and enriches his contribution with "a helper for the pine blossom;"¹ he extends Jimmy's contribution with some comparative facts of animal and plant growth;² and he

enlarges Gretchen's topic with "the first step in starting a garden, if what we plant in it is to grow."³ Molly tells an Indian myth, "The Star and the Lily."⁴

¹Comstock, op. cit., "Flower and Insect Partners," pp. 457-459.

²Discovering Our World, Book One, "What happens when living things grow?" pp. 49-51, passim.

³Discovering Our World, Book Three, "How is soil made ready for planting?" pp. 355-361, passim.

⁴Hamilton Wright Mabie, (ed.) Myths Every Child Should Know (New York: Doubleday, Page and Company, 1911), pp. 348-351.

Content Summary of Program No. 29.

The program is designed to follow completion of page fifty-six in Look and Learn, page sixty-five in All Around Us, and page fifty-nine in How Do We Know?.

The contributions of the script characters are, in summary: Buddy - plants grow in different ways, but they all grow, "like animals do, but different." His guess for the topic of the week is "a weeping willow." Jimmy - we can tell flowers and leaves apart by the way the petals look or the way the leaves look. His guess for the topic of the week is "pine needles." Gretchen - sunlight, soil, and water are the three things plants need to grow. Her guess for the topic of the week is "tomatoes for my garden." The General clarifies Buddy's concepts by rephrasing them

as "we can tell one plant from another plant by the way they grow," and "plants are different things than animals, but they are alike because they are both living, growing things;" he clarifies Jimmy's concepts with the words shape, petal, edge, vein, and leads him to restate his contribution using these words; and he enriches Gretchen's and the boys' topics by leading them to relate their new concepts on plants with geography (i. e., what plants do you find in the woods, in sunny fields, in swamps, on the water? and how many of these have you seen in your own neighborhood?). Molly tells the Chinese tale of "The Wonderful Pear-Tree."¹

¹Lee, op. cit., pp. 357-358.

Content Summary of Program No. 30.

The program is designed to follow completion of page fifty-nine in Look and Learn, page sixty-nine in All Around Us, and page sixty-one in How Do We Know?.

The contributions of the script characters are, in summary: Buddy - many plants grow from seed, "build" roots, stems, leaves, branches, flowers, make more seed, and die in a year. His guess for the topic of the week is "finding seed." Jimmy - a seed "makes" the same kind of plant as the "parent" plant, just like animals do, and also like animals,

some plants take longer to grow-up than others do. His guess for the topic of the week is "two kinds of clover." Gretchen - seeds have in them another plant and "food" for the new plant to start growing on until it can grow stems and leaves to make its own food from water, sunlight, and soil. Her guess for the topic of the week is "a baby plant." The General unifies and enriches the contributions of all three of the children with "why the earth is not overrun with plants."¹ Molly tells the Chinese fairy tale of "a strange tree in a strange place."²

¹Discovering Our World, Book Three, pp. 101-106.

² Rugoff, op. cit., "The Cinamon Tree in the Moon," pp. 193-195.

 Content Summary of Program No. 31.

The program is designed to follow completion of page sixty-one in Look and Learn, page seventy-one in All Around Us, and page sixty-three in How Do We Know?.

The contributions of the script characters are, in summary: Buddy - some things are alive but others are not, and one way we know what things are alive is that if they are alive, they grow. His guess for the topic of the week is "a flower shop." Jimmy - the seeds of plants are different for different kinds of plants. His guess for the topic

of the week is "apple seeds." Gretchen - a plant does different things with different parts of its "body" just as animals do because it uses its roots to get water and some other things, and its stem to carry the things to its leaves to be made into food. Her guess for the topic of the week is "a sick plant." The General enriches and amplifies the contributions of all three of the children with "why living things need water and air."¹ Molly tells the Greek Myth of the origin of the laurel tree.²

¹Discovering Our World, Book One, pp. 85-104, passim.

²Bulfinch, op. cit., "Apollo and Daphne," pp. 21-24. (condensed, simplified).

Radio Script for Program No. 32.

The program is designed to follow completion of page sixty-three in Look and Learn, page seventy-two in All Around Us, and page sixty-five in How Do We Know?.

The science concepts touched upon in the script are: (a) trees provide pleasure for human beings, and have special names for the different parts of them; (b) there are various means of seed dispersal; and (c) the parts of plants have various functional purposes to the life of the plant and different values for human use.

It is suggested that, if the listening children are not accustomed to musical-reading, they be introduced to

and made familiar with it before the broadcast. It would also be advisable to illustrate to the children before the broadcast the spherical shape of the earth with an apple pierced with a stick in a manner that will allow the apple to be rotated on the stick. This will perhaps aid the fleeting mental picture of this process referred to in the musical-reading on "Johnny Appleseed."

The usual references and suggestions follow the radio script.

(MUSIC: THEME IN ... UP ... UNDER)

GRETCHEN: "Hi," there, we're here again!

(MUSIC: THEME REPEAT ... IN ... UNDER)

GENERAL: The Science Club of the Air, that is.

(MUSIC: THEME REPEAT ... IN. .. UNDER)

MOLLY: With three "bursting seed pods" on our hands!

(MUSIC: THEME REPEAT ... IN ... UNDER)

BUDDY: --- with "trees for fun" ---

(MUSIC: THEME REPEAT ... IN ... UNDER)

JIMMY: --- and seeds "that go places" ---

(MUSIC: THEME REPEAT ... IN ... UNDER)

GRETCHEN: --- and the "feet of plants!"

(MUSIC: UP MOMENTARILY ... OUT) (UNDER GENERAL LAUGHTER)

MOLLY: My! this must have been some week at school
with science.

GENERAL: The children are especially gay today, let's

(MORE)

find out why. Buddy, what's your "trees for fun" mean?

BUDDY: Oooh, we did have fun this week, both at school and at home after school, cause we uh -- 'sper-ment-- uh

MOLLY: Exs-peer-ment-ed?"

BUDDY: Yes! -- with things at home we learned in school.

JIMMY: I do that lots of times.

BUDDY: Like we did this week?

GRETCHEN: How can we tell, Buddy, until you tell us what you did do?

BUDDY: We "visited at each other's houses," in "bunches," like we did when we went to the fire station, and the bakery. Only this time it was to see the swings, and tree-houses, and things everybody had at their house under trees to have fun with.

GENERAL: And what did you find?

BUDDY: Most of us had "swings," some that you sit in, some that you lie down in, ---

MOLLY: Hammocks?

BUDDY: Yes, --- some that you swing on with your hands. And Tommy has a tree house.

GRETCHEN: It belongs partly to Nancy, too. She and I had a play-house in it when I visited them.

- JIMMY: Tommy and I had a "look-out post for forest fires" up there when I visited them.
- GENERAL: Was that all you learned about trees this week Buddy, that you could "have fun" in them?
- BUDDY: Oh, no! We did have lots of fun, at every home we went to, but then at school we learned that trees are like flowers and other plants in some ways.
- MOLLY: Some trees do "flower," that is, have flowers on them.
- JIMMY: That's going to be their "seed," sometime.
- GENERAL: Do some seeds "go places," as you put it when you greeted the children, Jimmy?
- JIMMY: Most all of them do.
- GRETCHEN: And they travel in different ways, too. We had that last year.
- BUDDY: How do they "travel," they don't have legs!
- JIMMY: Kites and gliders don't have legs either, but they "travel," and some seeds do the same thing. They glide or float through the air, on "stiff wings," like the maple tree seed, or on fluff, like the willow and cottonwood tree seeds.
- MOLLY: What a nice way to say it, Jimmy! I like that.
- JIMMY: Some others don't travel "nice," - they "steal" rides.

- GRETCHEN: Cockleburrs and Spanish needles do that, by sticking to our clothes, or to the fur of animals. But they aren't tree seeds, they are flowers; I guess you'd call them weeds, really.
- BUDDY: They've got stems, though, and trees do too --- their trunk is their "stem."
- MOLLY: Listen to our "youngest one!" How wise.
- GENERAL: That is a very good comparison, Buddy.
- BUDDY: What's a cum-pair-uh-sun?
- JIMMY: I know that. It means to tell how things are the same and how they are not the same.
- BUDDY: Then I know some more cum-pair- uh --
- MOLLY: Comparisons.
- BUDDY: Yes. --- about trees and other plants. Their "stems" have bark on them, and are woody, so that we can make things from them when they have been cut down. But other plants don't have big, strong stems like that.
- GRETCHEN: Trees have stronger "feet" than other plants do, too.
- GENERAL: Now we find out what your "feet of plants" means that you used for a greeting today.
- MOLLY: Do tell us, Gretchen. That one puzzled me more than Buddy's "trees for fun" or Jimmy's "seeds that go places."

- GRETCHEN: The roots of plants are what they "stand on," so I just called them their "feet."
- BUDDY: Plants don't walk!
- GRETCHEN: No, of course not. But they use their "feet" in ways that we don't use ours.
- JIMMY: How?
- GRETCHEN: They take water and other things from the soil with their roots.
- BUDDY: Yes! I remember, you told us something like that last week, when you were talking about "what plants do with parts of their body."
- GRETCHEN: That's right. And now this week we learned that plant roots are just as different as other parts of plants are different from one plant to another.
- MOLLY: How can you tell, Gretchen?
- GRETCHEN: Well, just as you can tell one kind of flower from another by the shape and color of the petals ---
- JIMMY: --- and one kind of seed from another by how they look and how they get about ---
- BUDDY: --- and by their different parts, like a tree's branches and its leaves, or a flower's stem and its petals ---
- GRETCHEN: Yes. Well, like that, roots have different

(MORE)

- shapes in different plants. Especially plants we eat, like radishes, and beets, and carrots.
- GENERAL: What part of those plants do we eat, Gretchen.
- GRETCHEN: The roots! And I had never thought about the part of carrots, beets, and radishes that we do eat being their roots before we had it in our science books last week.
- GENERAL: The part of those plants we eat grow beneath the surface of the ground, don't they?
- MOLLY: So they do! And that's the part of any plant that is under the soil - the roots! Well, I'm like Gretchen, I'd never thought very much about that.
- BUDDY: Tree roots are under the ground, too!
- JIMMY: But one part of plants that isn't under the ground - until they get there to start another plant like it - is the seed.
- GENERAL: Yes, Jimmy. But I've been wondering why you hadn't mentioned the one way some seeds travel that give the most pleasure to us.
- GRETCHEN: What do you mean, General?
- JIMMY: I know - the ones that "pay for their rides!"
- MOLLY: Sounds like they might be called the "respectable citizens" of the seed-colony, with all the other seeds getting about in the ways you have already mentioned.

- BUDDY: How do seeds "pay for rides?"
- JIMMY: By being inside of something to eat, like plums, or pears, or oranges. They "pay" us for taking them some place while they are still inside the fruit by being so good to eat. Then we throw them away after we have eaten the fruit they were in.
- GENERAL: Or we plant them to grow more fruit. You did know what I was talking about, Jimmy. And that was a pretty clear way of saying that when fruits are eaten, the seeds are often discarded far from the tree from which they came.
- BUDDY: Morning glory seeds could get scattered, too.
- GRETCHEN: Or lettuce seeds, or cabbage, or celery. And that's the parts on those plants we eat, too-- the leaves, that do "turn into" seed, if we don't gather them to eat.
- MOLLY: I really believe you children learned more this week than ever before.
- JIMMY: We sure did learn a lot. In my class, we've been saving the seeds from all the fruit we've had this week, for a collection. We wash them off just a little, then spread them out on newspapers at the back of the lunchroom to dry.

(MORE)

Then after they are dry, we collect each kind of seed in a different box, with the name of what it is on the side of the box. We have more apple seed than any other kind, so far.

MOLLY: I know a story about "a boy who spent his whole life long in collecting apple seed and carrying them all about the country" to give them soft, warm homes in the good earth of our nation.¹

BUDDY: You do? What was his name?

MOLLY: Many people call him "Johnny Appleseed" because he gave such loving care to the planting of seed, especially the apple.

JIMMY: I'd like to hear about him. May we begin now?

MOLLY: If the General says we may.

GRETCHEN: Oh please, yes. May we, "General Science?"

GENERAL: No one could deny the right of "Johnny Appleseed" to as much time as he wants on any program for boys and girls who want to learn as much about our land, our world, and the creatures that live in it as they can. Let's bring him on!

(MUSIC: IMMEDIATE "FANFARE" PICK UP ON THE GENERAL'S
LAST SYLLABLE ... CONVERTING TO AN APPROPRIATE
MARCHING TUNE ... FADING UNDER)

MOLLY: Johnny Chapman was a little boy in the days of President Washington. But even after he was a big boy, roaming the western frontier of our

(MORE)

land, living among the Indians, or with the wild things of the forest, he was still just "Johnny" to those who knew him well and loved him much, for the fine, beautiful fruit that sprung up in the years to come along the paths he trod. Let's travel part of the trail (BEGIN FADE) with him.

(MUSIC: IN UNDER ... WITH AN APPROPRIATE TRANSITION INTO "COUNTRY-SIDE, "WOODSY, FIELD AND STREAM" THEME AT BEGINNING: CHANGING INTO APPROPRIATE TUNES THROUGHOUT.

(MUSIC: NOTE: THIS LEGENDARY TYPE ACCOUNT IS INTENDED AS A MUSICAL-READING, WITH CONSTANT BACKGROUND (NEVER INTRUDING) "ATMOSPHERE" ACCOMPANIMENT. MOST PARTICULARLY MUST THE CLOSING MUSIC BE A "HAPPY, JOYFUL" TUNE.

Johnny Chapman was a lad of seven years, with a heart full of joy and few "small" fears, who swam in the brooks and fished in the streams -- of Longmeadow -- while holding a love of the whole outdoors, whether roaming the woods, or doing his chores ... close to his own bronzed breast. Never telling where he had been, what he had seen, what he had done -- in the woods,

(MORE)

- up the river. But we may guess - in after years, what his life may be, - when we see: how the "master" at school, gave a rule, - built a lasting picture in the mind of a dreamful child: "A sharp stick," the "master" said, "an apple impaled thereon, and you see the planet Earth on which we swell, spinning on its axis," as he gave the apple a twirl. Earth is an apple, thought Johnny, earth is a big, round apple. (DOUBLE PERIOD PAUSE)

At seventeen - we may only guess, for the truth of the matter is long at rest under lock to which we have no key - Johnny-said-"I-will-be - a keeper of trees, learning to sow and to plant, to set and to prune, AND TO SCATTER - the seed of the world-spinning apple!

And he must have - though the flowing waters still beckoned to the stream-loving lad, for he said, -so-I-read, "rivers could take you 'most anywhere!"

And follow the rivers he did - ever westward, to the lands where few white men but many Indians lived - carrying with him in deer-skin bag, a host of precious apple seed - carrying with him in mind and heart, a flaming love - both for the service of man and God, the wild

(MORE)

things of the forest and the people of the new lands. By trail and by river he traveled, meeting the trader, meeting the trapper, meeting this question on everyhand: "Where ye boun' for?" And he was bold -I-am-told- to reply with this cry: "No place in p'ticular, but in the service of God to all places in the West good for planting and for pioneers!"

And they say, that today, when a child wants to know "will it grow?" as a seed finds its nest in the earth, soft and warm, Johnny's spirit answers "yes" - "come with me, come and see." And he takes them by the hand, through the land - where the trees that he has planted lift their boughs, ripe with fruit.

Thus he traveled through the land, meeting many, serving all; soon to answer to the call "apple-seed man" - then to "Appleseed John" - and when known, from what he'd grown from his seed, for their need, by the loving name -- now-his-fame: "Johnny Appleseed." To the children along his way -he-would-say: "Seeds are precious. Apple seeds in p'ticular, but all seeds!" In the fall -if-at-all- made he trips to the towns - made the rounds - of cider mills: sifting, sorting, drying out,

(MORE)

seeds to-carry-back in-his-pack. Friends and neighbors used to say: "without pay - for such labors - you'll be poor, that's for sure!"

Johnny always softly crooned: "I'll get by -- I shall sow -- as I go, and I'll reap -- heaps on heap -- of "golden apples in the sky" -- this is why: Earth is a round-round apple, moon is a "Golden Glow," sun is a red-red Russet" ---- didn't you know?"

Years roll past, and at last, here we see:

"Johnny Appleseed" - seventy-three! -knotted and gnarled like an old apple tree- -lying a-bed in an Indian hut- -leaves for his curtain from trees he had "built"- -dreams of his planting, that was his quilt. Youth now returns to his limbs and his sight- -spreading -a-light- -strong, -true, -and-white- -showing the way from the rivers of old- -finding a new one bright-to-behold.

"And Johnny Appleseed laughs with his dreams,"

Swimming once more in the ice-cold streams --

"Lifted his hands to the farm-filled sky,

To the apple harvest busy on high;"

Seeing the sun as a barrel of gold

Tipped-up, while juicy apples roll.

(MORE)

Now, people throughout the land -- from coast to coast, like to boast: "We knew Johnny Appleseed! He is our patron saint of fruiting orchards!

And the name of "Johnny Appleseed" -

"folksy as a country fair, --

"catchy as a country tune,"

lives on as he does - in the hearts of the people whose lands he planted with apple trees.

(MUSIC: FOLLOWING FINAL FADE OF "ATMOSPHERE" TUNE, QUICK PICK-UP INTO PROGRAM THEME ... UNDER)

GENERAL: (IN "IMPERSONAL, ANNOUNCER" TONE) Your Science Club of the Air will be back with you next week.

(MUSIC: PROGRAM THEME UP ... FULL...OUT)

¹Mabel Leigh Hunt, Better Known as Johnny Appleseed (New York: J. B. Lippincott Company, 1950), passim. also: Vachel Lindsay, Johnny Appleseed and Other Poems (New York: The Macmillan Company, 1934) pp. 82-92, passim. This adaptation is equally indebted to the prose of Miss Hunt and the poetry of Mr. Lindsay. Its effectiveness depends upon the pace, rhythm, and vocal interpretation of the reader.

Teacher References

- I. "General Science"
Comstock, op. cit.,

- "The Parts of the Tree," pp. 619-620;
 "Seed Germinations," pp. 458-459;
 "Seed Capsules," pp. 472, 489, 554;
 "Seed Balloons," pp. 493-494;
 Roots: "Pondweed," p. 498;
 "Clovers," pp. 592-593;
 Apples: "Apple Tree,")
 "How an Apple Grows,") pp. 661-
 "The Apple,") 669.

II. "Molly Myth"

- Hamilton Wright Mabie, (ed.) Myths Every Child Should Know (Garden City, New York: Doubleday, Page and Company, 1911),
 "The Three Golden Apples," (Hawthorne's Wonder Book), pp. 3-26;
 "The Pomegranate Seeds," (Hawthorne's Tanglewood Tales) pp. 27-64;
 "The Apples of Idun," (Norse Stories) pp. 330-326.

III. Follow-up Suggestions.

A. Dramatics.

1. "Arbor Day," from A Book of Plays for Little Actors by E. L. Johnson and W. D. Barnum. American Book Company, New York. (Grades 2-3)
2. "Little Christmas Tree," from Little Dramas for Primary Grades by L. A. Skinner and L. M. Lawrence. American Book Company, New York. (Grades 1-2)
3. "Seedlings," from Plays for School Children by A. M. Lutkenhaus. Appleton-Century-Crofts, Inc., New York. (Grades 5-7, but may be simplified and adapted to the primary level)

B. Nature Reading Club.

(Teacher to children)

1. Our Plant Friends and Foes by William A. DuPuy. The John C. Winston Company, Philadelphia, 1930.

(Children's reading)

2. What's Inside Plants? by Herbert S. Zim. William Morrow and Company, New York, 1952.

3. "What Wildflower Is It?" by Anna Pistorius. Wilcox and Follett, Chicago, 1950.
4. Where Are the Apples? by Arthur Flory. Elliott, New York, 1945.
5. Trees of the Countryside by Margaret McKenny and Alice Bird. Alfred A. Knopf, Inc., New York, 1942.
6. Science Stories, Book Three.
"How Do Plants Live on Land?" pp. 54-63;
"How Are Seeds Scattered?" pp. 64-67.
7. Science Stories, Book Two.
"How Plants Get Food," pp. 89-91.
8. Science Stories, Book One.
"Part 4: Plants," pp. 89-124.

C. Group Experiences.

1. Field Trip. "A Tree-Fun Excursion," similar to that described in the script.
2. Seed Collection, similar to that described in the script.
3. "How to Make Leaf Prints," Comstock, op. cit., p. 626.
4. "Starting Some Experiments" (with land plants) Science Stories, Book Three, pp. 49-50.
5. "Experiences with Plant Life," Garrison, op. cit., pp. 45-65.

Content Summary of Program No. 33.

The program is designed to follow completion of page sixty-five of Look and Learn, page seventy-three of All Around Us, and page sixty-nine of How Do We Know?

The contributions of the script characters are, in summary: Buddy - trees are plants, many plants are good to eat, and fruits are easy to tell apart by their shape. His guess for the topic of the week is "all kinds of fruit."

Jimmy - seeds and the plants that grow from them need water to grow. His guess for the topic of the week is "sprouting and growing a sunflower seed." Gretchen - leaves, stems, and roots of plants tell us what the plant is, each of these have special jobs in food-making, and flowers turn into seeds that are full of plant-food for a new plant. Her guess for the topic of the week is "wild flowers." The General unifies and enriches the contributions of all three of the children with a simplified introduction of plants that do not have roots, stems, flowers, or leaves.¹ Most primary age children who are interested in nature observation will inquire about pond scum, seaweed, moss, and they might as well acquire the basic knowledge, without difficult details, that these belong to the plant family. Molly tells the Hungarian folk tale of "The Speaking Grapes, the Smiling Apple, and the Tinkling Apricot."²

¹Craig, op. cit., pp. 235-236.

²Lee, op. cit., pp. 575-576.

Content Summary of Program No. 34.

The program is designed to follow completion of page sixty-seven in Look and Learn, page seventy-five in All Around Us, and page seventy-one in How Do We Know?.

The contributions of the script characters are, in summary: Buddy - we eat the seeds of some plants, the stems

of others, the leaves of others, the roots of others, but many kinds of plants are just to look at because they are very pretty. His guess for the topic of the week is "good things to eat." Jimmy - plants need light to stay green, and if they are not already dead when they turn yellow without light, light will make them green again. His guess for the topic of the week is "bringing a yellow plant back to life." Gretchen - weeds are plants that are bad for a garden because they use up what the plants we want to grow need to live, some insects are also "enemies" of good plants because they eat the leaves and stems, and we must be the friend of good plants to keep these two things from happening to them. Her guess for the topic of the week is "a garden that has no enemies." The General unifies and enriches the contributions of all three of the children with information about "the ways in which living things are each the other's friend."¹ Molly tells an Eskimo tale of "a plant that thought it had no friends."²

¹Discovering Our World, Book Two. "How do animals help plants?" pp. 29-34; "How do plants help other plants?" pp. 35-38; "How do plants help us?" pp. 51-54.

²Rugoff, op. cit., "The Discontented Grass Plant," pp. 103-108.

Content Summary of Program No. 35.

The program is designed to follow completion of page sixty-nine in Look and Learn, page seventy-seven in

All Around Us, and page seventy-five in How Do We Know?. These are the final pages in each of the texts, so the program also has a unit-summary function, with personal projects replacing the children's "guess" for the topic of the week.

The contributions of the script characters are, in summary: Buddy summarizes his unit with the many ways people and animals use plants. He has added another section to his "Personal Growth" Album, called "Plants That grew Up While I Grew Just One Year," consisting of photographs of himself with plants, and tracings of plant-part growth as his own physical growth records are kept. Jimmy summarizes his unit with the many ways people and animals help and are helped by plants. He has a Leaf Collection similar to, and a "partner for" his Feather Collection of the first unit, consisting of copy-paper leaf prints, labeled with name and identification of the plant's seed. Gretchen summarizes her unit with what plants must have, what they must not have, and what people do to meet these needs. She has added to her "Water Animals" book of the first unit a section called "Water Plants." The General leads the children to clear statements of their unit summaries and helps them in the presentation of their project descriptions by pointed questions. Molly tells the Wyandot myth of the "Creation of the World."¹

 Judson, op. cit., pp. 9-11.

Radio Script for Program No. 36.

The program is designed to summarize the year's work, to conclude the series, and to encourage a similar activity for the following year.

The broadcast is partially in the form of a "Quiz Kid" program. The children should be prepared for this. If their interest and abilities indicate, help them organize their own group into a similar activity. The actual activity may be either conducted by them before the broadcast or as a participating activity during the broadcast. If the latter is used, they may want to choose a "captain" as the script children are representing their classes, and have these three children take their place at the front of the room "at their desks" as this phase of the broadcast develops. They can receive organizational training and team-play experience by monitoring the answers of these "captains" and by voting for the winners on "points." "Judges" from the faculty or upper-grade children might make the final decision. Many of the ideas from this source will naturally carry over into follow-up activities after the broadcast.

The usual references and suggestions follow the radio script. Since Program No. 35 has concluded the unit on plants, this section for the final program of the year is, for the most part, of a general nature, touching upon the whole year's work, the summer vacation period, and anticipating the coming school year.

(MUSIC: THEME IN ... UP ... UNDER)

GRETCHEN: Our Science Club of the Air is on the air ---

(MUSIC: UP ... UNDER)

JIMMY: --- for the last time ---

(MUSIC: UP ... UNDER)

BUDDY: --- this year! The General said we could have another club like it next year if we wanted it!

GENERAL: I did, indeed. For I'd be happy to visit with you in your science studies every year.

MOLLY: It certainly has been fun.

GRETCHEN: Yes, it really has. But we're all through now...

JIMMY: --- except for our "Parade of Projects" ---

BUDDY: --- and for our "Quiz Program!"

GRETCHEN: I don't mind the projects, I like to show and tell about what my class has done, but ooh! the "quizzin" scares me!

MOLLY: Don't worry, Gretchen, I'm sure you're just as much of an "expert" on what you've studied this year as the boys are.

JIMMY: Yes, but we're sort of "captains" for our class on the "expert" teams, and I have to win for my whole class!

GENERAL: If you win, Jimmy. Perhaps Gretchen or Buddy may "win for their class."

BUDDY: Oh my class helped me get ready! We spent the whole week asking all the questions we could

(MORE)

think of, and everybody helped answer them.

MOLLY: That sounds like a very good idea. But if you are to be "Quiz Kids" and "Project Reporters" we'd better "get going," --- is this big cardboard tray over here, so mysteriously covered up, your class project Buddy?

BUDDY: (Excitedly) Yes! I thought sure you'd "peek" under the wrappings while we were carrying it in.

MOLLY: Oh, no! I only offered to help carry it because it looked almost bigger than you!

GRETCHEN: Here, I'll help you bring it over, Buddy.

(BUSTLING ABOUT SOUNDS UNDER FOLLOWING)

JIMMY: It sure is big, Bud; guess I'd better help, too.

GENERAL: (OVER SOUNDS OF PAPER COVERING BEING REMOVED)
Now let's take the "mysterious" covering off.

GRETCHEN: A whole house and yard!

BUDDY: (Pleased) The house isn't very big. It's just there to show that houses "go with yards."

(GENERAL LAUGHTER)

JIMMY: And to put the sign, "Outdoors" on.

MOLLY: I guess they could have put that on the edge of the box lid, here, Jimmy.

GENERAL: I think it looks very well right in the middle of the roof.

- GRETCHEN: Look, it says "Outdoors" on both sides of the sign.
- BUDDY: That's so that you can read it from the front side where the flowers are, or from the backside where the tree and the vegetable garden are.
- JIMMY: Boy, that's good, Bud. How'd you make this tree stand up so well after you got it made?
- GRETCHEN: I'll bet they set the cardboard trunk in a tiny little hole in the bottom of the box lid.
- BUDDY: With some paste on it first. 'Course we had to put it up two or three times, when we started moving the whole "outdoors" around. (LAUGHTER)
- MOLLY: It's a wonderful project, Buddy, with something of everything you studied about plants on it.
- GENERAL: Ask your teacher to keep it until next year, Buddy, and change the growing things on it as they change during the seasons of the year.
- JIMMY: Say, that's an idea for us next year, to make one right through the year!
- MOLLY: What did you do this year, Jimmy. I didn't see you bring anything with you.
- GRETCHEN: He did, though. It's in that box he had under his arm.
- BUDDY: Let's see, Jimmy. (MORE ACTIVITY SOUNDS UNDER)
- GENERAL: Here, I'll help you get it out.

JIMMY: It's a "book" that isn't put together yet.
That's why I had it in a box.

MOLLY: "Flowers of Our State!" Oh, let's see them. I
do love beautiful flowers.

GRETCHEN: Some of them are real flowers, ---

GENERAL: But all very neatly done and labeled.

GRETCHEN: Others are drawings.

JIMMY: Yes. The real ones are those we brought to
school to make the room pretty. Then before
they were too "old" we pressed them between
sheets of paper in a big book, and when they
got flat, we put them on these pages with their
names under them.

MOLLY: I'll bet this pansy was lovely when you could
see the colors.

GRETCHEN: Here's a drawing of a pansy. Was it like this
one, Jimmy?

JIMMY: Yes. We all drew a picture of them the day
Nancy brought them, and this one was the "best"
drawing. When we put our book together this
real one and that drawing showing what it looked
like when it was alive are going to be "facing"
each other on the pages, so you can see them
both at the same time.

GENERAL: This is quite a big collection, Jimmy. Have you

(MORE)

- seen all these flowers?
- JIMMY: Not all of them. These first ones are what we have seen. These others are ones we found in a book about flowers of our state.
- GRETCHEN: We sure couldn't use anything in our class project that we hadn't seen.
- BUDDY: You sure couldn't!
- MOLLY: Have you seen it, Buddy? I didn't see Gretchen bring anything in when she came, either.
- JIMMY:
BUDDY: (LAUGHING) She couldn't bring their projects!
- JIMMY: Unless she dug up the school yard!
- BUDDY: (Gleefully) Or Jerr's yard!
- GENERAL: It sound very much like Gretchen's class made gardens.
- GRETCHEN: Not very big ones. But the girls did plant and take care of one small flower bed in the school grounds, and the boys made a little vegetable garden in Jerr's back yard.
- JIMMY: We got some of our flowers from their "garden" -
- BUDDY: All the classes got one bouquet from it. Ours were "bachelor buttons."
- GRETCHEN: No one got the poinsettia, though. Barbara took it back home. We just had it in the ground in the can her mother planted it in, anyway.
- JIMMY: And only one bloom ever came out, anyway.

- MOLLY: Well it looks - and sounds - very much like you children certainly "put into practice" what you learned about plants.
- GENERAL: Now let's see if you can put into words what you learned about everything. (SOUND - SCHOOL BELL, IMITATION OF QUIZ KIDS PROGRAM) The Quiz of the Science Club is on-the-air! (BACKGROUND SOUNDS OF SCURRYING AND EXCLAMATIONS: Oooh! Get to your desks! Put on your "thinking caps." Get set.) Ready or not, here I come!
- CHILDREN: Ready! (Sotto follow-up: "I hope.")
(NERVOUS LAUGHTER)
- GENERAL: You keep score, Molly.
- MOLLY: All right. I'm ready, too.
- BUDDY: Me first, please!
- GENERAL: You must think your "loaded," Buddy. (LAUGHTER)
Let's see if you are. You told me at one of our meetings that there were many kinds of plants. See how many you can name! ("DEEP" SILENCE --- (AUDIBLE BREATH IN-TAKE, EXPELLED ALMOST EXPLOSIVELY THROUGH FIRST PART OF FOLLOWING)
- BUDDY: Trees, bushes, flowers --uh-- moss (ACCLIMATION SOUNDS) --uh-- vines, vegetables, fruits -- may I say kinds of vegetables and fruits?
- GENERAL: It isn't really necessary. But "fruits" come from plants, don't they?

- BUDDY: (Disappointedly) Y-e-s.
- MOLLY: You did beautifully, Buddy. Better than I could have done, I'm sure.
- JIMMY: Yes! Me, too. (WITH ONLY AUDIBLE SIGH IN BACKGROUND FROM GRETCHEN).
- GENERAL: Well, let's see about that, Jimmy. You told us one week that there were certain ways you could tell things that were living from things that were not alive. Name those ways.
- JIMMY: (Laughing) The funny things we had in that lesson to say if they were "alive!" I know those ways - I copied them off the board the day our teacher put them up there for us to make lists under. She left the list up when we got through for any of us to write down in "language time" who wanted to. You can tell "right quick" what's alive if the answer is "yes" to these three questions: "Does it grow? Does it have babies or make others like itself? and Does it die?"
- GENERAL: (BELL FANFARE) G-O-O-D! Couldn't have done better myself!
- GRETCHEN: Oh, yes! That was fine, Jimmy. U-mm-mm-mmmmm.
(IMITATION "SHAKES") Now it's my turn.
- GENERAL: (IN "FATAL" TONE) Now it's your turn. (FOLLOWED BY CHUCKLE) I think I'll just "fire" questions
(MORE)

"at" you. (QUICKLY) How do green plants get their food?

GRETCHEN: (Slowly) Uh ... they... (quickly) they make it!

MOLLY: Hoorah for Gretchen! (DEEP SIGH FROM GRETCHEN)

GENERAL: ("MOCK FRUSTRATION" TONE) Hmmm! (Quickly) (THE FOLLOWING QUESTIONS ARE "POPPED" AND ANSWERED IN QUICK SUCCESSION, WITH APPROPRIATE BACKGROUND SOUNDS FROM OTHER CAST MEMBERS - NO WORDS, ONLY "SOUNDS").

GENERAL: How do plants make others like themselves?

GRETCHEN: From seeds!

GENERAL: Name two enemies of plants.

GRETCHEN: Weeds and "bugs!"

GENERAL: Why do we befriend plants?

GRETCHEN: Befriend? Oh -- "take care of them" ---

GENERAL: Yes.

GRETCHEN: Some to eat, some to look at!

GENERAL: That's all. (IMMEDIATE CLAMOR OF ACCLAIM)

BUDDY: (TOPPING THE CLAMOR) WHO WON? WHO WON?

(CLAMOR QUICKLY DIES)

GENERAL: Scorekeeper, how many corrections did I make?

MOLLY: Well -- only one "small" one - Buddy ---

BUDDY: (GROANS)

MOLLY: --- for saying "fruit" was a plant.

GENERAL: I'm afraid I meant to make another "small" one - Gretchen, bugs, beetles and worms, or ---

GRETCHEN: Insects! That would mean all of them. Oh, gee!

MOLLY: Then that leaves only Jimmy.

BUDDY: Jimmy won! I'm glad! 'Cept I'm sorry 'bout not winning for my class.

GRETCHEN: Yes, Jimmy was best. But of course, I'm sorry too, that I "lost" for my class.

GENERAL: Well no one really "lost," for you all did very well. But since each of you are just acting "captain" for your class team, I suppose we had better declare Primary II the Quiz Winner.

JIMMY: Gee, thanks!

BUDDY: Let's ask the General questions now!

GRETCHEN: Oh, could we?

MOLLY: (Laughing) On the spot, General.

GENERAL: (Chuckling) Well time may save me. We don't have much more.

JIMMY: I've got one I'd sure like to have answered.

GENERAL: What is it, Jimmy?

JIMMY: Well, last week Molly told us the story of -- uh how some Indians thought the world was made ---

MOLLY (Gleefully) And you want the General to tell you "a story" of how it was really made!

JIMMY: Yes. I saw a lot of pictures in a magazine this year about it, and they sure were "pretty" -- but I couldn't understand much about it, even when Daddy tried to tell me something about it.

GRETCHEN: I saw those too, in LIFE magazine. Mother kept them. She said maybe someday I could explain it to her.

(GENERAL LAUGHTER. FADING UNDER)

GENERAL: It is a mighty big "answer," and of course, even today, we aren't sure we have all the answer. But science does have a better "picture" of it than the peoples of the "days of myths." I'm afraid we won't have time for very many details on what we do know, so I'll just try to give you a small, "quick" picture of what we know about the "very beginning of things."¹ Let's do it by taking an exciting, "make-believe" trip, back into a long, long, past time. We can't be on the earth, because it will be the time before the earth was "born." So let's pretend we're riding through space on the spinning sun - a great, blazing ball of fire. And let's pretend that we have bodies that fire nor anything can hurt, eyes that can see far-away things, and lives that will last more years than you know how to count. Now -- with all this "in our pocket," we go whizzing along through space on the blazing, whirling, "storm-ridden" sun - for its motion and speed are a million times worse than the greatest storm we can imagine.

(MORE)

We see millions of stars, all over the sky. One of them seems brighter and nearer than all of the rest, and it seems to grow brighter and nearer with each fleeting second. Time that we cannot measure goes by as we race along through space on our blazing sun. That bright star grows brighter than ever. It's in our path! It's moving, too - right toward us just as fast as we are moving toward it! We'd better do something about this - there's going to be a great crash! Let's slip away from this raging ball of fire we are riding on -- out into cold space beyond. Far beyond the splintering, awful crash that is bound to come. Now --- perched out here in the middle of nothing, we see that "the star" is another giant sun - also tearing through space with great speed. We surely did get off just in time. For "our" sun and the on-coming star MEET -- and pass, but so close that there is a frightful explosion - and another, and another -- till our sun seems to be a giant Fourth-of-July pinwheel, shooting huge mountains of sun-stuff toward the passing star. It has such speed, though, that when the flaming parts it is drawing from "our" sun as they pass - like a magnet draws metals - they reach the place

(MORE)

it was, while it goes rushing on in its own path. They are flung out in space, in great curves from "our" sun, straining toward the fleeing star, which grows smaller and smaller in the distance. "Our" sun has been left the center of a mighty pinwheel of shining dust and blazing rocks and other things, as it continues its speeding course through the sky - an enormous, whirling cloud of scattered sun-stuff, flying out - millions and millions of miles out into space. Not reaching our safe, sound "perch" in space - of course. Huge chunks of the swirling mass now roll into balls themselves -- still pulled by the retreating star, but more strongly pulled by the closer sun, so that they now swing around and around the sun, ever pulling, never stopping their circling path. Finally, the "balls" farthest out from the sun are moving more slowly than the wildly swirling closer ones - and in larger and larger circles from the sun. They look "thinner," too, now - with our "super-eyes" we can almost see inside them. They are cooling into clumps of shining dust, still circling, pulling - now cracking together, now bouncing apart, but all going in the same direction in their everlasting

(MORE)

circle. Their circle is getting closer to us, now. We're no longer in cool, safe space - but in the midst of the sun-cloud! - flying along again faster than we know how to tell. And everything in sight is flying along with us. Now we find ourselves being bumped by little clumps of sun-stuff that didn't seem a second ago to be anywhere near us. Everything is now pulling a little on everything else. There are bright, star-like things moving through the shining sort of "fog" all around us. One looms up very near us - big, and frightening! But it is under us, not on us! And we are "falling" - no - being pulled toward it. Gently at first, but now harder and harder, until we are really falling, fast - with a hot, moist wind blowing past us. Now we pass through a layer of steam, and plunge into a white-hot sea of melted rock! (QUICKLY) Our let's-pretend bodies can't be harmed by anything, remember! And well they can't - for - we have reached the surface of the earth! "In the beginning of things," you see - the EARTH WAS JUST A TREMENDOUS, GLEAMING BALL OF MELTED SUN-STUFF. (MOMENTARY "DEAD" SILENCE)

CHILDREN: (ALL LET OUT THEIR BREATH IN A GREAT "GULP")

JIMMY: Boy! That was better than a "rocket trip to the moon!

BUDDY: Yes! Some trip!

GRETCHEN: Oh my - YES! Hey, look at the time!

MOLLY: ("Wail" in her voice) And we were going to tell the boys and girls lots of things we've been planning!

GENERAL: No time, now! Ask your teachers to tell you about our plans for next year, and for "summer fun with nature." They'll have lots of things to tell you. We have to go now - quickly!

BUDDY: Almost as fast as our "trip on the sun!"

OTHERS: (LAUGHING) Yes! 'Bye! Have lots of fun with nature this summer. "SEE" you next year! (FADING UNDER)

(MUSIC: UP ... FULL ... TO CLOSE)

¹Carleton and Heluiz Washburne, The Story of Earth and Sky (New York: D. Appleton-Century Company, Inc., 1935), A summarized adaptation of "The Earth is Formed," pp. 3-8.

Teacher References

I. "General Science"

The script reference above; Extended readings in all previously given sources.

II. "Molly Myth"

In addition to further reading in all previously

given references, these two books may have versions considered suitable for use without adaptation:

The Stars in Our Heaven, Myths and Fables by Peter Lum. Pantheon Books, Inc., New York, 1948.

Enchantment Tales for Children by Margaret Evans Price. Rand McNally and Company, New York, 1926.

III. Follow-up Suggestions.

A. Dramatics.

1. "Boastful Bamboo Tree," from Little Dramas for Primary Grades by L. A. Skinner and L. M. Lawrence. American Book Company, New York. (Grades 1-2)
2. "Flower Show," from Programs for Special Occasions for Primary Grades by Marion Kennedy and K. I. Bemis. A. A. Berned and Company, New York. (Grades 1-4)
3. "Marjorie's Garden," from Five Plays and Five Pantomimes by Sidney Baldwin. The William Penn Publishing Corp., New York. (Grades 4-6, but may be adapted for use on the primary level)

B. Nature Reading Club.

Completion of Science Stories, (Books One, Two, and Three).

Books from the Bibliography of the Guidebooks for each texts not already used should be classified for summer reading, listed, and distributed to the children along with "recommended summer reading" from other sources and subject areas.

This very new book is especially good: Who Went There? by Carroll Colby. Aladdin Books, New York, 1953. It is an excellent book about the tracks and trails of animals, birds, snakes, and other creatures.

C. Group Experiences.

1. The Guidebook Extending and Enriching Activities will have been used throughout the course, it is presumed.

2. Any further applicable activities from sources previously suggested.
3. The "Parade of Projects" for this unit as described in Chapter II in connection with Program No. 9.
4. The "Quiz Kids" activity suggested in the before-the-broadcast preparations of this program.
5. "Summer Fun with Nature." Plan with the children, in their "social studies" area of the classwork, things that can be done during the summer in both indoor and outdoor nature studies. Divide the planning into two main parts: things that can be done alone; things that can be done with others. Use the materials and projects of the year's work for ideas and guides. Strongly encourage continuation of any personal projects of a worthwhile nature through the summer and in the direction of life-hobbies.

This program completes the presentation of the thirty-six broadcasts for the series. Chapter VI summarizes and evaluates the Project.

CHAPTER VI
EVALUATION SUMMARY

Certain educational aims and objectives were listed in Chapter I as underlying this Radio Project for the Primary Level. Those presented for education in general, for the elementary field of education in particular, and for the specific area of study, science, will be found to be inherent in the course of study on which the Project is based: Scott, Foresman and Company's Basic Studies in Science for the primary level of their Curriculum Foundation Series. This may be verified by an examination of the purpose, areas of interest, and skills developed in the course as these are set forth in the Introduction to the Guidebook for each of the texts.¹

The direct objectives of A Radio Project for the Primary Level are considered to have been achieved in the manner and by the methods given in the following paragraph.

(1): The work of the classroom teacher is supplemented by the Project per se and by the references and suggestions accompanying each program.² (2): Classroom

¹Guidebook for Look and Learn, pp. 4-7; Guidebook for All Around Us, pp. 3-7; and Guidebook for How Do We Know?, pp. 4-8.

²Exemplified in those programs appearing in radio script form.

activities of the listening children are motivated by the activities of the script children and by those listed in the Follow-up Suggestions. (3): Interest and enthusiasm for the study of science is created by the personalities and individual enthusiasm of the script children. (4): The contributions of "the General" and "Molly Myth" as well as the participation of one script child in the conversation of another in his presentation of concepts for his group, unify the primary program of basic science. (5): Obviously, Molly and her stories are the integrating link between science and literature. More will be said on this subject later in the discussion. (6): Hints are given throughout the exemplified programs in radio script form and in the Follow-up Suggestions for coordinating primary basic skills of the language arts: the stories written in "language period," the drawings made in "coloring period," and the outside reading done for personal and class projects. The value of these and other allied activities will also be touched upon briefly later in the discussion. (7): Auditory learning is inherent in the medium, and is further developed by the obvious teacher-pupil relationship between the children and "the General." Even though the listening children may have had the exact material in their own classroom from their own teacher, this vicarious repetition is both a review and an added medium for retaining the knowledge acquired in their class work.

Many schools now plan their curriculum on the "core" basis, especially in primary classes. This Project hints at the possibility of making the science series partially the core of such a curriculum plan by the number of activities of a primary program coordinated with it. This is a sound educational principle, for generally it can be agreed that effective learning springs from association of as large a range of interrelated and varied experiences as possible. Work in art, reading, writing, spelling, and composition stem from the program activities. Even the field of arithmetic, or "numbers," was once touched upon - in the time-keeping activities of the radio script for Program No. 14. Competent rendition of the scripts can serve as a model in vocabulary and pronunciation improvement, and can motivate purposeful verbal and creative expression. Interest can also be developed in the mechanical process of handwriting and spelling with the motivating purpose of producing work on personal and class projects in these skills of "Project Parade" quality for the suggested unit-completion displays. From the standpoint of the value of the series as a stimulus to reading, the follow-up suggestions are more important than the broadcasts. The outcome of this value rests largely with the classroom teacher's use of the suggested reading activity. Her own resources can enlarge or adjust those of the individual programs.

The area of reading is widened by the integration of the nature myths with science. Since this constitutes the major claim of the Project as a valuable addition to the science series, it is considered advisable to evaluate this phase more fully.

The advisability of a Project integrating literature and science may be questioned by some educators. The animistic representation in children's literature has often been of great concern to some college and university professors of the sciences. One authority in the field takes this practical view of the situation:

"Science demands truth and fact. Young children are interested in 'fairy tales'! Can we strike a 'happy medium'? ... Kindergarten and first-grade children thrill to nature stories. ... fanciful tales capture the imagination of young children to a remarkable degree. 'Bambi,' 'Mickey Mouse,' 'Donald Duck,' and a cocky little rabbit that chews carrots and greets human adversaries with a cheerful 'What's up, Doc?' are well known to children of all ages ...

"One of the most phenomenal records for continuous performance on the radio, coast to coast, has been that of the children's program, Let's Pretend.

"The point is this: Child psychology and child sociology indicate paths to the child subconscious which pure science tends to ignore.

" It then becomes a matter of when, how much, how often, and how such references are utilized. The key to the dilemma is child maturation.¹

¹Harrington Wells, Elementary Science Education in American Schools (New York: McGraw-Hill Book Company, Inc., 1951), pp. 84-87, passim. The italics of the "depending" words in the last paragraph quoted are those of the thesis writer.

It is the contention of the writer that the integration of science with literature through nature myths and legends in this Project is sound from the viewpoint of "when," "how much," "how often," and "how." When? In early childhood, when the inclination toward this type of literature is strong. How much? Not excessively, for the basis of the Project is science, the myths and legends are the addendum. Moreover, the percentage content of science concepts far outweighs the literary. It is admitted that a classroom teacher could unbalance this evaluation by her choice and use of legendary material from the Teacher References, but this has not been the intention of the Project. Far fewer references will be seen to have been presented in the "Molly Myth" division than the remaining groups, most of which are scientific references. How Often? With the provision that it not be unbalanced by teacher guidance of the participating group, this is once a week for myths against five days a week for science. The legendary references given are intended to be used in correlating, not replacing, the basic studies in science with literature. Reading and language areas are the proper place for their use. How? This is given in the explanation of the plan and procedure of the Project: "scientific facts learned by the children during the week in the regular classroom work are ... paralleled with nature myths accounting for these facts by the peoples of antiquity."¹ It is believed that both science

¹Supra, p. 9.

and literature will be more meaningful to the primary child when the natural link between pure science and nature myths is utilized. Especially is this true when the beliefs of the myth-makers are presented to the children in the light of their child-like questionings of the phenomena of nature about them with no one to answer their questions. The admonition in Chapter II to teachers in adapting mythological accounts to primary level will be recalled at this point.¹ The author's (or adaptor's) own attitude toward nature myths is the key. The predominance of Walt Disney characters in the above quotation by Professor Wells is significant here. The artistic representation given animations by that studio verifies the point being made. It is also claimed that the frank approach to the mythological content of the programs is a conditioner for developing a healthy attitude toward the world of fantasy to be found in literature and drama, while promoting an appreciative attitude in these fields at the opportune age.

These, then, are the claims that are made in support of the achievement in the programs of the objectives set forth for the Project.

It is believed that a sufficiently interested classroom teacher could develop the programs presented in content summary form in the manner of the programs presented in radio

¹Supra, p. 16.

script form. It is also believed that she could adapt the Project to any one of the three methods for use listed in Chapter I¹ as a supplementary aid to her classroom teaching with the aid of the pre-broadcast and participation hints and the references and suggestions for teachers following the radio script form presentations.

¹Supra, p. 10.

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