ABSTRACT

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Title of Study: THE WORK AND BENEFITS OF AN ELEMENTARY SCIENCE SUPERVISOR IN A SMALL SCHOOL

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Scope of Study: In this report a program has been set up indicating the work and benefits of a science supervisor in guiding a science program in the elementary grades. The results of this program is expected to give the pupils in the elementary grades a much broader background, and to create more interest in science. The author does not deny that science is a hard field, but he does maintain that with the proper background and interest children will find science much easier.

Findings and Conclusions: One of the chief reasons for the shortage of scientists is the shortage of good teachers of science, not only in the high school but in the grade school as well. One of the soundest things to do in light of modern elementary school practice is the training and employment of more science supervisors, people who know science and elementary education, people who can effect significant changes on a broad scale.

ADVISOR'S APPROVAL James H. Zant

THE WORK AND BENEFITS OF AN ELEMENTARY SCIENCE SUPERVISOR IN A SMALL SCHOOL

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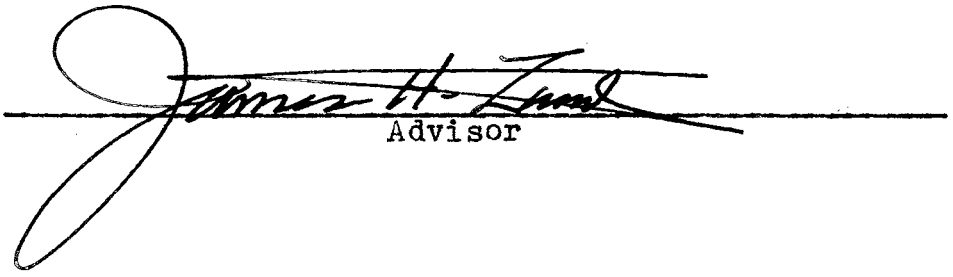

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CHAPTER I

INTRODUCTION

The need for a strong science program in the elementary school, both for purposes of general education and vocational choice is now generally agreed on, in view of the present shortage of specialized science personnel in the United States. Most educators will agree that many career choices are made before the age of twelve, yet most children at this age haven't had enough science to give it due consideration.

The main purpose of this report is to set up a program indicating the work and benefits of a science supervisor in guiding a science program in the elementary grades. The results of this program is expected to give the pupils in the elementary grades a much broader background, and to create more interest in science. The author does not deny that science is a hard field, but he does maintain that with the proper background and interest children will find science much easier. Most children in elementary grades have a curious mind and when exposed to a rich and progressive science program, will immediately become hungry for new experiences in science, reaching out for everything he can get through reading material, and any actual experience he can find relating to science.

Most elementary teachers are required to take only one

science course for their specific degree. A single course in science helps, but science is a rapidly changing field, classroom teachers need assistance in keeping up with the new problems that always arise in the field of science. It is understood that many classroom teachers will resent the help of a supervisor and may even reject it at first, perhaps because they themselves have found science uninteresting, but in the end it is hoped, they will have a different point of view.

The report has been organized in the following arrangement:

Chapter I: Introduction.

Chapter II: The Schedule of an Elementary Science Supervisor. This chapter presents the argument that unless the supervisor has an adequate amount of time the program may suffer considerably.

Chapter III: Demonstrations and Experiments. This chapter explains how individual experiments should be carried out whenever possible, as experiments are more meaningful when you make them happen yourself. The more complicated experiments should be demonstrated by the teacher or supervisor.

Chapter IV: Field Trips. This chapter explains how natural, industrial and historical field trips all have their place in a successful science program.

Chapter V: Conferences with Teachers and Students. This chapter explains how important it is for teachers and students to confer with the supervisor.

Chapter VI: Securing Printed Curriculum Aids. Extra printed curriculum aids should be provided, particularly for the more progressive students.

Because many of these interesting activities are continually omitted from the general science program, most pupils leave grade school cold to science and science teachers. The superficiality of the science program and the lack of action in it has given them little or no incentive to continue further study in science.

CHAPTER II

THE SCHEDULE OF AN ELEMENTARY SCIENCE SUPERVISOR

It is understood that an elementary science supervisor will probably have other duties, since it is recognized that most small schools are unable to maintain a supervisor for the sole purpose of handling the elementary scince program. The position in the school system which the supervisor holds does not matter as long as he has the proper training, however the position of junior high or high school science teacher would be the most logical, this would enable them to use the equipment without interferring with the work of other instructors. Richard R. Armacost[1] states that:

> A teacher especially prepared with a broad science background and equipped with efficient teaching procedures is needed to meet the requirements for the development of good general science programs, and good general science teaching. Many diverse ideas exist concerning the training of general science teachers. There are those who still think that "anyone" can teach general science. Some think training should be little different than that of the more specialized biology, chemistry, or physics teacher. Others point to the general science teacher as a unique person who needs a very specific type of preparation.

If we concede that science is essential, it follows that we must provide time for it in the program in some way or another, how this is done will be influenced by local tradition

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[1]Richard R. Armacost, "Some Thoughts on General Science and General Science Teacher Preparation," Welch Biology and General Science Digest, Vol. 7, 1, November, 1957, p. 12.

and philosophy. The time allotted for this program would vary in different schools, but two hours a day would be advisable, since the success and interest in the program would depend upon the amount of time available to the supervisor in preparation. The supervisor may be given only one hour the first year, as he may need to persuade the superintendent and the public of the need, and benefits of a supervisor. After the science program is once integrated into the school curriculum and if it is a lively one the children will see that the public is as concerned about it as they are about athletics, music, or any other activity.

A large percent of the supervisor's time should be spent in planning his lectures and demonstrations, checking the physical condition of the area over which a field trip is to be taken, and preparing for a science fair. One of the fastest ways of bringing science into prominence is the staging of a science fair. The children can be instructed and given the material to make such simple projects as a telegraph set, electric motor, compass, and etc. prizes should be given the best ones.

One school system has described the work of its science consultants as follows:[2]

AS A RESOURCE PERSON

. . . Helping to plan ways for science to enter into classroom experiences.
. . . Where there is a definite science interest in the classroom, and the teacher does not feel sure how to develop this interest, the consultant will help the

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[2]J. Myron Atkin and Tracy Ashley, How About Science, Great Neck, New York, Public Schools, 1951, p. 4.

teacher to discover directions in which to proceed.

. . . To suggest ways that illustrative and reference material, demonstrations, and science equipment may add vitality to learning situations.

. . . To help meet sudden science problems that arise.

. . . To suggest places that may be visited in connection with science activities in the classroom.

. . . To prepare occasional leaflets and helps on current, pertinent science topics.

. . . The science consultant will conduct workshops, demonstrations, and experiments which may give classroom teachers interest-provoking experiences that they may wish to take back to the children.

AS A CO-TEACHER

(In all cases, co-teaching should be preceded by a conference with the classroom teacher).

. . . If a science project is under way and the teacher feels that further development of the topic will be useful, the science consultant will work directly, teaching the class.

. . . In some instances, the science consultant will be pleased to initiate a science "unit," if there is an interest or need in the classroom and the teacher feels help is needed in starting.

. . . If a teacher has a small group or a single child with a special interest, plans can be made for the group or child to work with the science consultant, apart from the class.

. . . The science consultant will gladly work with a group of children preparing a science demonstration or experience which they'd like to take back to the classroom.

. . . The science consultant will always enjoy the opportunity to work with the class in planning for a new science area.

Hiring a science supervisor on a twelve month basis would be highly recommended. Some of the interest that might otherwise die could be kept alive during the summer by a science club meeting once a week and by holding a summer science fair. Time could be spent during these meetings by working on projects, both as a group and individually, incidental learning situations such as news items about eclipse, earthquakes, floods, hurricanes, jet planes, and atomic energy arouse curiosity and interest in young children.

George C. Kyte[3] states that:

> Although he may know little about many of the subjects involved, there is no reason to be disturbed about this fact or to avoid inclusion of them in his class program. Children recognize that the teacher cannot know everything, his frank acknowledgment of lack of information about a particular subject, accompanied by his proposal that teacher and pupils learn together, appeals to children of all ages.

Field trips taken during the summer will be met by wide approval as there will be more time for the kids to discuss some phases of the trip that would otherwise be neglected.

The use of textbooks during the summer should be omitted, this would be too much like school and the instructor wouldn't receive as much response, however, extra-curricular material could be secured from companies or occassional leaflets could be prepared by the instructor covering the topics discussed, field trips, and the projects undertaken by the group.

The science fair should be staged on a Saturday, either at some building down town or some place on the school ground. If the supervisor could secure the backing and services of some dependable business men to act as judges and in the awarding of prizes, this would greatly boost the program. Most business men would be glad to show the projects in the windows of their stores, bestowing much pride and encouragement on the youngsters.

The author realizes that in order for a supervisor to meet this schedule, he must have a sincere desire and will-

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[3]George C. Kyte, The Elementary School Teacher at Work, Dryden Press, New York, 1950, p. 317.

ingness to work and learn with children, otherwise the program would collapse and greatly injure the chances of others who might propose a similiar program.

CHAPTER III

DEMONSTRATIONS AND EXPERIMENTS

Demonstrations and experiments is the part of the science program all children eagerly look forward to, therefore it is one of the most important, if not the most important part of the program and much careful planning should be given to this part of the program. "Experiments in the science course may either be the stimuli that starts the young person functioning or they may be the brakes upon the student's enthusiasm."[1] Demonstrations should be carried out in the individual classroom, this will prevent the repetion of demonstrations year after year, if demonstrations are repeated every few years they should be more advanced and technical each time. Blough and Huggett[2] states:

> In all science units experiments should be conducted whenever possible. The child is a natural investigator and manipulator of things, by all means let us try to keep this tendency alive. Many of our schools are so academic in their approach to science learning that children with this natural tendency to manipulate have to wait until Saturday before they can express it. We must first of all realize that this tendency of pupils is a valuable one, that we must have more doing in our science teaching, providing for it, equipment (with childrens help) and time and space.

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[1]Helen L. Merrill, The Science Teacher in Action, Christopher Publishing House, Boston, 1956, p. 15.

[2]Blough and Huggett, Elementary School Science and How to Teach It, Dryden Press, New York, 1953, p. 57.

One benefit of these experiments and demonstrations should be the correction of misconceptions. Children come to school with superstitions they believe in and prejudices they have formed, usually as a result of parental influences. Such things as snakes grow from horsehairs that have fallen into water; this is a common misconception. Don't put it off, set up experiments immediately to disprove fallacies. After disproving a few of these, the children will create a love and respect for science, this will also cause a desire to search for other misconceptions and questions they are concerned about. Experiments that help answer questions about things that children see in the world about them are worthwhile. Some things to remember about the experiments are: keep the experiments simple, "since there is less money spent on the middle grades than any other age group,"[3] the amount of material and equipment will be limited, the children and the rest of the community can be relied upon to furnish simple and inexpensive materials; plan experiments carefully and let the pupils do as much of the planning and work as possible, seeing things happen is even more exciting when you make them happen; if classes are large and there is available material, pupils may work in groups.

One of the most important benefits of an elementary science program is to build or start the building of a good foundation for the characteristics that we are trying to develop in children, those characteristics are the same ones

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[3]Hollis L. Caswell and Arthur W. Foshay, Education in the Elementary School, American Book Company, New York, 1950, p. 15.

possessed by a scientifically minded person. Blough and Huggett[4] lists these characteristics as follows:

(a) He is open-minded-willing to change his mind in the face of reliable evidence and he respects anothers point of view.
(b) He looks at a matter from every side before he draws a conclusion. He does not jump at a conclusion or decide on a basis of one observation, he deliberates until he is sure.
(c) He goes to reliable sources for evidence, he challenges sources to make sure they are reliable.
(d) He is not superstitious, he realizes that nothing happens without some cause.
(e) He is curious. He is careful and accurate in his observations, he plans his observations carefully.

The supervisor must keep in mind that one of his main purposes is to get the classroom teacher to do as many routine demonstrations as she can. Although many teachers feel inadquate in performing demonstrations they must be made aware of the fact that most teachers already teach more science through demonstrations than they think. They simply haven't put the label of science on the things they do. For example, raising various kind of house plants or keeping an aquarium in the classroom, helping children keep a weather chart by reading the thermometer and barometer, indicating the direction of the wind, and recording the types of cloud formations. However these activities could be approached in a way that would help children get more out of science. Consider the aquarium for example. After gathering the material for it they pay little attention to it after the aquarium is stocked. Plants and animals must be in equilibrium, plants and ani-

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[4]Blough and Huggett, Elementary Science and How to Teach It, Dryden Press, New York, 1953, p. 52.

mals reproduce, water evaporate from it, and all sorts of other things go on unnoticed. There goes all that science to waste! With just a little planning these activities could be demonstrated for the enrichment of children's experience.

The supervisor must have a knowledge of the concepts to be taught in the grades, so as to plan the demonstrations, and demonstrate them before-hand to the teachers, as they occur in the subject matter. He must see that the classroom teachers do as many of the demonstrations as they are capable of doing and that they fully understand all of the demonstrations, in order that they may be able to carry them out in the succeeding years.

The supervisor should construct a group of kits, one for each specific subject, such as, the weather, electricity, magnetism, oxidation and various others. This will make it convenient and will greatly encourage the classroom teachers in carrying out demonstrations. This will also save the supervisor an immeasurable amount of time.

CHAPTER IV

FIELD TRIPS

"Going to see" is an important part of an effective science program. Potentially it is one of the most enjoyable and instructive ways to learn when teachers, pupils and the adults in the place to be visited work together in planning and carrying out the excursion the results are most likely to be those we hope for.

In every community there are places to see that will help the science work make more sense. There are more things to see on the schoolground than most teachers realize, for instance, one small piece of the outer bark taken from the north side of an elm tree, will be almost certain to contain several different types of lichens, algae, and moss. Learning to distinguish between these organisms could be very interesting. By observing the bark of the tree it is possible to determine the path the water takes in running down the tree. This path will be somewhat less colored than the rest of the tree. A limb that has been pruned can be used to show the annual rings, and different tissues of the trees. The cambiums effort to heal the wound can be observed, as well as various fungi which may be found abundantly around the wound.

Although this kind of a field trip is very enriching,

the children will be looking forward to leaving the school ground. This is the type of field trip the supervisor must plan for. No field trip should be made unless there is a reason for it. Nor should it be taken without the supervisor checking in advance the physical condition of the wooded area they are planning to visit, or the manufacturing plant to see which hour or day of the week would be the best time for the students to observe the plant in operation. Some factors in the planning and executing of a successful field work were given by Dexter.[1] They were:

1. Familiarity with region.
2. Organization of trip.
3. Objectives.
4. Attitudes.
5. Viewpoint of ecological interpretation.
6. Collecting (judicious).
7. Projects.
8. Training and experiences for teachers in how to conduct field trips and such as, conservation camps and laboratories.

Field experiences should be carefully planned and carried out under teacher supervision and guidance in order that this teaching aid be meaningful and valuable in presenting and solving problems under consideration. Field trips should be taken during the time those particular topics are being discussed in the classroom. A followup conversation and the recording of information are ways in which important results may be achieved.

After the classroom teachers have taken their students on one or two of these field trips, with the aid of the super-

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[1]R. W. Dexter, "Field Study -- The Backbone of Biology and Conservation Education," School Science and Math, Vol. 43, pp 509-516, June, 1943.

visor, they will feel capable of carrying out other field trips independently.

CHAPTER V

CONFERENCES WITH TEACHERS AND STUDENTS

TEACHERS

Conferences with individual teachers will probably be more effective than meeting with the entire group. The teacher will feel freer to ask questions. Most people hesitate to admit their ignorance of a subject, even though it is completely out of their field. Also since demonstrations are to be given independently, the teachers will need individual information and instructions on the subject. J. Myron Atkin[1] relates that:

> Thus the science consultant acting as a resource person might give several different types of assistance. To the classroom teacher who feels competent in elementary science and who has rich science content background, he might only furnish equipment, books, and an occasional suggestion. For the teacher who feels completely inadequate at first when working with children in the science area, he might do all the science teaching while the classroom teacher watches him work with the children. Through such demonstration teaching, the classroom teacher might begin to feel more competent and gradually take greater responsibility for the teaching of science.
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> Generally, the science consultant improves the quality of science instruction through procedures such as these: demonstration teaching, developing printed curriculum aids, conducting workshops in elementary science for teachers, holding individual planning conferences with teachers to make suggestions for improvement of the science program, ordering and storing science equipment and books, and working with administrators in helping them to see the importance of science in the total curriculum.

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[1] J. Myron Atkin, "Needed: Elementary School Science Consultants," The Science Teacher, Vol. XXIV, No. 6, October, 1957, p. 271.

One of the most important things to be discussed during these conferences, is the progress of the students. These students will fall into two categories, those seeking individual help, and those who need help but do not seek it. It will be up to the teachers and supervisor to spot these latter students, who are more common in our schools than we realize. The teacher and supervisor should work together in giving individual help to these students, as much more can be accomplished working together.

Field trips should be planned and discussed far enough in advance to insure a successful field trip when it is undertaken. After confering with the teachers as to when they will be ready for a particular field trip, the supervisor may be able to arrange for more than one class to make the trip at a time. This will be possible particulary in nature study.

The confidence of the classroom teacher must be constantly bolstered. They must be made aware of some very important facts in their favor. Blough and Huggett[2] list them as follows:

(a) Almost all boys and girls like science.
(b) They don't expect you to know all the answers to their questions.
(c) Science in the elementary school should be kept very simple.
(d) You can learn with children.
(e) It is no harder to teach science than it is to teach social studies or language arts or anything else.
(f) Science experiences often work in naturally with the general learning going on in your room.
(g) The first time over the ground is the hardest, a little practice in teaching science will bolster your confidence.

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[2]Blough and Huggett, Elementary Science and How to Teach It, Dryden Press, New York, 1953, p. 4.

STUDENTS

Conferences with the supervisor will give the students an added boost in working on projects. If they can get the information needed for a particular project it will encourage the student to choose a much more complex problem. "Our students generally speaking, are capable of learning far more than we commonly have taught."[3]

Here are several examples of various methods in which science consultants may work with classroom students.

"In a first grade, a puppet stage had been constructed in shop. The children desired to have footlights 'like the real stage in the auditorium.' The science consultant was called in, and, working with an interest group, wired the puppet stage for lights.

"A fourth-grade class had been given physical examinations by the school physician. The children showed a great interest in their bodies following this and expressed a desire to learn more about the human body. The classroom teacher was interested in going further and talked the situation over with the science consultant. Together, they planned a series of science lessons, taking up the different functions of the body. From this, the class made a study of proper foods and diet.

"A sixth-grade group had been studying the material that make up the earth. They had gone into elements, compounds, and mixtures. The teacher then called upon the science consultant for help. The science consultant worked with groups from the class. One group collected samples of elements and compounds. Another worked out experiments which showed chemical and physical changes. Another group discovered through experiment that new compounds may be made by combining, and that compounds may be broken down into elements. With high interest the children took these demonstrations back to the whole class.

"A third-grade youngster, new to the school, adjusted very poorly to the group. He played alone and was largely ignored by others. The teacher discovered that his only sustained interest was in the collection of insects. The science consultant, at the suggestion of the classroom teacher, worked with the boy alone, since this was not a need of the entire class. The boy learned to kill, identify, and mount insects. His collection was source of great interest to the

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[3]Will Burnett, Teaching Science in the Secondary School, Rhinehart and Company Inc., New York, 1957, p. 21.

whole class. The boy became a more acceptable group member. This experience not only served to stimulate a specific intellectual activity, but helped to start him on cooperative work with others.

"A sixth-grade became interested in electrical fuses in connection with a larger unit on safety. A pupil committee worked with the science consultant to build a demonstration model of a fuse. The committee then reported back to the group and gave a demonstration of a short circuit, using materials that were safe to handle. They showed the class what makes a fuse blow out and how the fuse protects homes and people.

"A first-grade teacher wanted to work with her pupils in science. Not having a definite idea of where to begin, she came to the science consultant. They talked about the things the children brought in and planned work in electricity for the group since a lamp was being built for the room, and several children had indicated an interest in flashlights."[4]

The supervisor must be a diagnostician and highly skilled in resolving the problems of his work. He must add to his understanding of science an understanding of young people and how to work with them in such ways that his instructional goals are achieved. He must realize that each child is different from all others and must be considered as a special case. Some children may be aggressive, noisy and inattentive, these are the "class clowns." Some students are largely withdrawn, they are "shy" and "sensitive," and retreat into a world of make believe where problems don't exist. Both of these types of students need help but "psychiatrists point out, however, that the withdrawn child is more likely to remain seriously maladjusted than is the aggressive child,"[5] therefore the withdrawn child should receive first attention.

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[4]J. Myron Atkin and Tracy Ashley, How About Science, Great Neck, New York, Public Schools, 1951, p. 4.

[5]Hollis L. Caswell and A. Wellesley Foshay, Education in the Elementary School, American Book Company, New York, 1950, p. 266.

The supervisor should attempt to get these kinds of students interested in some kind of a project. Most children are interested in some particular subject, it is the supervisors job to find out what this subject is, either through the teacher, the parent, or the pupil himself. Besides giving help, the supervisor may give material to aid the students with their projects, in order to sustain their particular interest, and develop the qualities of responsibility and self-reliance.

The ideal consultant will have a broad background of experience with children, including demonstrated proficiency as a teacher, and extensive training in guidance work. Children should feel that they have a friend in the supervisor, and should be permitted to confer with him anytime they request a conference, if at all possible.

CHAPTER VI

SECURING PRINTED CURRICULUM AIDS

Children cannot learn everything by experimenting or by first-hand experiences. We learn much from reading in textbooks, supplementary books, bulletins, magazines, and newspapers. Since many learning difficulties of his students can be traced to reading deficiencies, the supervisor needs to appreciate the importance of reading in learning science. Reading is condemmed in many cases as a method of learning science, not actually in the reading of science but in the manner in which children are asked to do the reading. Asking children to open their books read so many pages and answer the questions at the end of the chapter, isn't a good basis for reading. Reading during or following experiments, demonstrations, or discussions should be requested by the supervisor. Reading is then done to check conclusions, to answer a question, to find additional information or to learn how to do an experiment. Some purposes for reading listed by Blough and Huggett[1] are:

(a) Reading should be done with a specific purpose--to check conclusions, to answer a question or solve a problem, to find additional information, to learn how to do an experiment or for some other definite reason.

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[1]Glenn O. Blough and Albert J. Huggett, Elementary School Science and How to Teach It, Dryden Press, New York, 1953, p. 30.

(b) Reading may often be more effective if it is done from several sources. These sources supplement one another--more information is thus gained and different points of view are noted.
(c) In science, pupils may come to a clear realization that there is a real difference between materials that are read for fun and those for information.
(d) Selecting the material to be read may be done by both the pupils and the teacher. The use of table of contents, index and other reference tools is necessary. Pupils may take notes on the reading they do. This may be an essential part of the "research reading" done in science selecting materials on varying levels of difficulty is essential if reading is to function as a tool for learning. In any grade, it is not usual for all pupils to be ready to read the science book written for that grade.

An instructor who is effective in securing additional printed material can greatly enrich the children's learning. Some publications that are helpful to a science program are, Weekly Science Reader, Current News in Science and Aviation, and Science News Letter. Additional material can be secured from various departments of the federal, state, and local governments.

Interest will be much higher and the information will be more eagerly awaited if the addresses are given to the children and permitting them to write for the material. This will encourage more effective reading. Anything addressed to children in this age group will be looked on as something special, and they will not put it down until they have read every word.

Calling children's attention to articles and clippings in newspapers, and magazines, and holding a short discussion period on these topics can be highly educational. Incidental science is likely to be inadequate and disorganized. This is true even though some of our best teaching sometimes results when incidental problems are raised because of some local

happening, through current reading, or by way of science material children bring in. However the schedule should be flexible enough to include incidental learning situations. A teacher who does not capitalize on a Sputnik, is missing a very important incidental learning situation. If handled correctly and not over-done it is one of the most effective phases of a science program.

CHAPTER VII

CONCLUSION

Many experts say that the shortage of scientists has its roots in the elementary school. Fewer high school students are choosing science and mathematics as subjects now. The important year of decision to be a scientist is usually the ninth grade. The amount of background and interest the students have accumilated during the preceding eight years will have a large influence on this decision.

Many high school students are not choosing mathematics and science courses because they want to take the easy way out. There is little doubt that they are among the more diffcult courses. The most disturbing thing here is the tragic waste of good brains when students of high ability choose the softest subjects.

One of the chief reasons for the shortage of scientists is the shortage of good teachers of science, not only in the high school but in the grade school as well. The elementary school science supervisor is one method of improving elementary science programs. Other reasons for the shortage of scientists is the greater difficulty of science and mathematics courses, due mainly to the unprepardness of the students. The rewards of a teaching career are smaller too. Pay scales of teachers have lagged far behind rising living costs. Many

who have prepared to teach science have been influenced by higher salaries paid by industry.

One of the soundest things to do in light of modern elementary school practice is the training and employment of more science supervisors, people who know science and elementary education, people who can effect significant changes on a broad scale.

BIBLIOGRAPHY

Armacost, Richard R., "Some Thoughts on General Science and General Science Teacher Preparation," Welch Biology and General Science Digest, Vol. 7, No. 1, November, 1957.

Atkin, J. Myron, and Ashley Tracy, How About Science, Great Neck, New York, Public Schools, 1951.

Atkin, J. Myron, "Needed: Elementary School Science Consultants," The Science Teacher, Vol. XXIV, No. 6, October, 1957.

Blough, Glenn O., and Huggett, Albert J., Elementary School Science and How to Teach It, New York, The Dryden Press, 1954.

Burnett, Will, Teaching Science in the Secondary School, New York, Rhinehart and Company, Inc., 1953.

Caswell, Hollis L. and Foshay, Arthur W., Education in the Elementary School, New York, American Book Company, 1950.

Dexter, R. W., "Field Study--The Backbone of Biology and Conservation Education," School Science and Math, Vol. 43, June, 1943.

Kyte, George C., The Elementary School Teacher at Work, New York, The Dryden Press, 1957.

Merrill, Helen L., The Science Teacher in Action, Boston, Christopher Publishing House, 1956.

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