THE SCIENCE SUPERVISOR AND

THE INTEGRATED SCIENCE PROGRAM, K-12

BY

JOE WARREN LANDRY

Bachelor of Science
Louisiana State University
Baton Rouge, Louisiana
1958

Submitted to the Faculty of the Graduate School of
The Oklahoma State University
in partial fulfillment of the requirements
for the degree of
MASTER OF SCIENCE
July, 1961

THE SCIENCE SUPERVISOR AND THE

INTEGRATED SCIENCE PROGRAM, K-12

Report Approved:

L. Herbert Bruneau

Report Adviser

Dean of the Graduate School

ACKNOWLEDGMENTS

The writer wishes to acknowledge the valuable assistance of his graduate adviser, Dr. James H. Zant, and express appreciation to him and to the many other members of the faculty of Oklahoma State University who contributed so much of their time and interest in the preparation of this report.

The writer wishes to express his appreciation to the National Science Foundation for the grant through which this work was undertaken.

TABLE OF CONTENTS

CHAPTER I

INTRODUCTION

At a time when our position in world leadership is being challenged, our traditional thoughts on the place, importance, and function of science in the high school curriculum is also being challenged. This paper attempts to look at the present thinking on the role of the science supervisor in implementing a more effective integrated science program, K-12.

The writer has a personal interest in this matter, as eventual work in this area is anticipated. The year as a Traveling Science Teacher and the Academic Year Institute training have served to point up, to the writer, the need for concerted effort by educators in all areas to work for a more effective program, oriented towards society's needs and geared to use the interest youth exhibits in the sciences. So often it appears that a "traditional" approach has served either to plant the idea, "science is for the other fellow," or the "this is what we studied last year" attitude.

The various areas of science instruction in the overall school program are undergoing study and improvement as to (1) what they should attempt to do, (2) which people are to be reached, (3) what effects are desired, and (4) how far should science study be carried by the general student.

Where do we start? Who does what? These are the types of questions administrators, supervisors, and teachers must ask and answer if real progress is to be made toward more effectively useing student interests and needs, teacher aptitude and zeal, and public concern and interest.

CHAPTER II

THE SCIENCE SUPERVISOR

Science supervision is one of the specific areas of the broad field of supervision. It has special interests peculiar to science instruction, but primarily, the methods are those of supervision in general. Supervision has been defined as the encouragement, stimulation, and guidance of the teacher to his maximum capacity, so that he may in turn contribute to the maximum development of every pupil in his class.[1] It has also been said that the first function of supervision is the coordination of teacher's thinking toward the refinement of common ends.[2]

Supervision, to be effective, should be scientific leadership. The basic qualities of this leadership should

---

[1]Joseph Mersand, "Creative Supervision in the Secondary School," Bulletin of the National Association of Secondary-School Principals, Vol. 43 (December, 1959), p. 23.

[2]Harl R. Douglass and Charles W. Boardman, Supervision in Secondary Schools (Boston, 1934), p. 39.

be that it:

1. releases the talents of individuals,
2. helps the group define its goals,
3. respects individuality yet develops consensus,
4. develops respect for evidence,
5. demonstrates teaching effectiveness,
6. demonstrates faith in people.[3]

Supervision has become scientific exactly as all the other modern undertakings have become scientific, because they are in the hands of competent men who have learned that success depends on the collection of objectives and facts, on the derivation of broad principles of action from these facts, and on the discriminating application of these principles to the emergencies of practical life.[4]

At the same time that concepts are being stated as to what supervision is and should be, a point about what supervision has been on occasion should also be noted. In times past, supervision has been synonymous with inspection and

---

[3]Charles R. Spain and Harold D. Drummond, Educational Leadership and the Elementary School Principal (New York, 1956), pp. 9-19.

[4]Charles H. Judd, "Can High School Supervision be made Scientific," Bulletin of the Department of Secondary-School Principals of the National Education Association, Vol. 12 (March, 1928), p. 163.

snooping. The lingering effects of this type of supervision may still be noted in the attitudes of some teachers. To many teachers, supervision is obnoxious because they assume that the teacher must conform to methods and attain standards set by the supervisor, even though the teacher may be in disagreement with the principles and methods involved.[5] Considerable maturation in the concept of supervision was shown in the literature on the subject, during the decades from 1930 to 1950, and some genuine progress was made on the operational level as well. Less emphasis was placed on inspection, rating, direction, and imposition; and more emphasis was placed on democratic leadership, inspiration, coordination, and service.[6]

As the science supervisor orients his thinking on what he will do as a supervisor, he must be aware that:

1. Supervision is a planned program for the improvement of instruction.

2. A supervisor is a person responsible for working

---

[5]Jesse H. Newlon, "Creative Supervision in High School," Bulletin of the Department of Secondary-School Principals of the National Education Association, Vol. 13 (March, 1929), p. 21.

[6]Clarence Fielstra, "Supervision Today," The Bulletin of the National Association of Secondary-School Principals, Vol. 34 (December, 1950), p. 11.

CHAPTER III

THE SCIENCE SUPERVISOR AND THE CURRICULUM

As state departments of education, educational institutions, and faculties are pressed hard to make the very best and most economical use of time, money, and facilities, the various curricula are having to be knit into more cohesive frameworks. The phrase, "scope and sequence," takes on new meaning.

This is true of the science curriculum in particular, as a solid growing foundation is a necessity. The science supervisor can and should play a great part in aiding the staff in formulating and activating a dynamic curriculum.

The Oklahoma State Department of Education in its recent publication, The Improvement of Science Instruction in Oklahoma, Grades K-12, states:

> 1. There should be established in the public school system in the State of Oklahoma a recognized program of science instruction in each of the elementary grades. The teachers, students, administrators, and parents should be made aware of this program's existence as science instruction.
>
> 2. The committee recognizes that the science material in the first, second, and third grades will, and probably

should be integrated with the other materials in the daily school program. However, it feels that there are certain basic concepts and general understandings that should be brought to the students' and teachers' attention in these earlier grades, and it is upon these basic concepts and understandings that the teachers in the higher grades should be planned and integrated, and should not be a haphazard, incidental development of scientific ideas. All participants should be kept aware that they are working in the area of science and scientific understanding.

3. The science program in the 4th, 5th, and 6th grades should be so designated with specific periods set aside during the day for the study of science and scientific principles. In so far as possible, these science experiences should be of an individual laboratory nature.

4. The Committee recommends that all school systems be required to offer a full year's course in science in both the 7th and 8th grades, both science courses to be required of all students completing the 8th grade. The 7th grade course should place most of the emphasis on the earth and physical sciences with special emphasis on the concepts of space. The 8th grade science course should be essentially biological science and include the fundamentals of biology which are considered to be necessary in the education of all good citizens. In general, it is expected that the materials now included in the 8th and 9th grade "General Science" would be included in the 7th and 8th grade science courses, with more rigorous treatment of the subject matter.

5. The Committee recommends that a course in "Physical Science" be offered in the high school, probably either at the 9th or 10th grade level, and that this course be required for graduation for all students in Oklahoma. This course in Physical Science should embody the basic fundamental concepts of chemistry and physics, especially as regards the structure of the atom and molecules, and the relationships of matter and energy.

6. The Committee recommends that the specialized

high school courses in biology, chemistry and physics have as their basic prerequisite the course in Physical Science. These specialized science courses should be elective rather than required. It is expected that these specialized science courses would be of a modernized nature and would be in keeping with recent curriculum developments.

7. All courses in science should include time and facilities for individualized laboratory work.[1]

Though the suggestions of this committee in Oklahoma will not necessarily meet the needs of all science programs, their suggestions can serve as a starting point for curriculum investigations. There is a noted change of attitude as to what the science curriculum should attempt to accomplish. At the turn of the century, the basic goal was to teach science as though the recipient would become a worker in that particular field; the present thinking is to give a general acquaintance to the areas of science to all our people. This attitude is prompted by the fact that with the great technological advances of the time, no one is unaffected by these developments.

The above mentioned course of study indicates a definite concern over the problem of beginning the proper science program from the earliest years of the child's training.

---

[1]Paul R. Taylor and others, The Improvement of Science Instruction in Oklahoma, Grades K-12 (August, 1960), pp. 3-4.

This concern is indicated by Robert H. Beck and others, when they write:

> Our first aim is to train children in the scientific method from the very beginning. Scientific habits of thinking and scientific attitudes developed by students during their science study, are a great deal more significant than is the subject-matter content of the science that they learn, though that is important, too. The habits and attitudes will remain with the pupils for a much longer time.[2]

Until recently, the teaching of science in the elementary grades was an after-thought. No specific time was set aside during the day for a study of science and its meaning. Science to the "typical" teacher meant a collection of facts about nature. This attitude prompted the teacher to direct the students toward such projects as collecting insects, drawing animals, or listing the daily weather. This type of activity is definitely a part of science, but it cannot help the beginning student develop the concepts needed for future development. It is far more important that the material studied helps the student develop sensitivity to relevant evidence, the willingness to suspend judgment until a conclusion has been warranted by experiment and observation, the

---

[2]Robert H. Beck, Walter W. Cook, and Nolan C. Kearney, Curriculum in the Modern Elementary School (New York, 1953), p. 320.

ability to make warranted deductions from evidence, and the ability to make disciplined observations.[3]

In working for the implementation of an effective curriculum, the supervisor finds that there are a number of steps that must be taken. The teachers must be drawn into the development of the needed curriculum; they must be made a vital part of its planning. The importance and dependency of one part of the curriculum on the other should be stressed, and the group should be aided in determining goals for their particular level of instruction. The "finished product" of the proposed curriculum should be envisioned by the group, and tests of the curriculum should be devised. The staff personnel must come to understand that working on curriculum is a way of life for the teacher.[4]

The supervisor cannot depend upon his personality to bring these things about. He must plan and work to get the group involved in the problems that confront it.

---

[3]Ibid., p. 320.

[4]Benjamin L. Simmons, "Obstacles to Curriculum Development," The Bulletin of the National Association of Secondary-School Principals, Vol. 43 (February, 1959), p. 26-29.

CHAPTER IV

THE SCIENCE SUPERVISOR AND THE IMPROVEMENT OF INSTRUCTION

One of the outstanding programs of the supervisor should be his program of improvement of instruction. This means improvement of the effectiveness of the teaching, as well as the improvement of the materials of instruction. As the teacher works with the student, both the method and the materials will contribute to the degree of development of the scientific attitude in the student.

Improvement of the teaching can be fostered most effectively by inducing the teacher to increase his sensitivity to the student and to examine his practices in the classroom.[1] Sensitivity to the student is a quality that sometimes tends to wane with increased years of service in a particular grade or subject area, and it is the responsibility of the supervisor to aid the teacher in maintaining his awareness of the

---

[1]Muriel Crosby, Supervision as a Co-operative Action (New York, 1957), p. 27.

changing student. The term, changing student, is used to indicate that as our society grows and develops, the child at a particular age level tends to come to the teacher with information that previously had to be taught at the grade level in question. This is particularly true in the science area, as the child in his early years comes into contact with many of the things previously learned in the classroom, via such media as television, radio, and newspapers. This change necessitates changes in the material and the approach used in the classroom.

It is imperative that the teacher of a particular grade level or subject be a part of the science team--a team that has a stated purpose and plan for the teaching of the sciences from grade one to twelve. The supervisor must use his authority to promote group morale, group self-discipline, and group self-direction. This is the group conscience concept, which means that each person works with every other person to achieve the goals all have accepted.[2] This group planning concept requires that the science supervisor possesses exceptional ability, excellent training, and wide teaching

---

[2]Harold P. Adams and Frank G. Dickey, Basic Principles of Supervision (New York, 1953), p. 2.

experience. The personal knowledge of the educability of the student at the various grade levels will materially aid the supervisor in the enlistment of the teachers' abilities, energy, and enthusiasm toward the improvement of the instruction.

The encouragement of individual teacher planning is as important as the program of group planning. The teacher needs to be guided to plan with the over-all science program, K-12, in mind, looking both forward and backward. They need to look for those threads of continuity begun in earlier years to which they may attach the concepts and ideas which they are helping the student to develop. Further, they must look at concepts which are to be developed in later years and search out ways to prepare the student to understand them by directing their attentions to elementary special cases and introducing, even though briefly and simply, ideas which will grow in importance later. The supervisor needs to:

1. Be sure that the teachers understand the basic ideas themselves,

2. Encourage them consciously and deliberately to seek out and use continuing threads in daily teaching, and

3. Provide for joint vertical staff meetings where talk of the nature and role of these continuing ideas is

discussed in an interested and purposeful atmosphere. Continuity, not uniformity, in teaching methods is important as far as the spirit of inquiry and discovery is concerned.[3]

The supervisor must help some elementary teachers of both mathematics and science to overcome basic fears of the subjects. Several studies have brought to light the fact that the majority of elementary school teachers of arithmetic admittedly fear and dislike the subject.[4] Such mind-set stems from the fact that the teachers are the products of a mathematics education which placed a premium on knowing about, rather than on knowing; on memorizing book definitions and following prescribed rules of operation rather than on thinking and analyzing.[5] Though these comments are pointed at the arithmetic instruction, they are equally valid for the science instruction in a number of cases.

---

[3]Phillip S. Jones, "Articulation Between Elementary and Secondary School," The Bulletin of the National Association of Secondary-School Principals, Vol. 43 (May, 1959), p. 107.

[4]Wilbur H. Dutton, "Measuring Attitudes Toward Arithmetic," Elementary School Journal, Vol. 55 (September, 1954), pp. 24-31.

[5]Catharine M. Williams, "A Portable Mathematics Laboratory for In-Service Teacher Education," Educational Research Bulletin, Vol. 39, No. 4 (April, 1960).

A definite program of aid for the elementary teacher, who has had little formal training in the sciences, should be instituted. A large portion of this effort can be handled through the in-service training program. Direction should be given towards less and less dependence on receipes for teaching and the dependence on workbooks (usually aids to minimize the teacher's efforts and need for understanding).

Classroom visits will remain a function of the science supervisor, but with a different idea in mind than would have been true during the age of "snoopervision." The supervisor needs to see the teacher in his natural surroundings working with the students. Of course, the value of classroom supervision as a supervisory service will depend on the insight of the supervisor in assessing the different phases of the teaching-learning situation.[6] In this work, the supervisor must convince the teacher that his presence is not for the noting of errors, but rather that he may be a help-mate. He can best do this by his attentiveness to the class and its activities and his helpful comments to the teacher, indicating strengths and weaknesses. The actual approach will

---

[6]George Gould, "Do Principals Supervise and How?" The Bulletin of the National Association of Secondary-School Principals, Vol. 26 (May, 1942), p. 75.

depend on the personality of the supervisor.

As with all supervision, the science supervisor, too, will be called on to rate his teachers. This may be a rating on a sheet or a mental rating. In either case, the rating is necessary in order that:

1. Instruction may be improved.

2. The supervision may be more intelligent and more effective.

3. Hopelessly weak teachers may be separated from the system.

4. Promotion may be based upon merit rather than upon personal preference alone.

5. Teachers may be furnished with a rational urge for development professionally.

The rating of a teacher should be based partly upon the teacher's own qualities and partly upon the results achieved by his pupils.[7] Lester S. VanderWerf suggests that the supervisor make the following assumptions as he makes his evaluation:

1. Teachers are being evaluated with or without

---

[7]Joseph F. Gonnelly, "Rating of Teachers by Supervisors," Bulletin of the Department of Secondary-School Principals of the National Education Association, Vol. 12

relationship to pay.

2. Teachers, some of whom may be threatened by assumption (1), are evaluating their pupils.

3. Learning, the teacher's stock-in-trade, is at least as complex as any other process in which human beings are engaged.

4. There is no such thing as objective objectivity, there is only subjective objectivity.

5. Teachers vary in their abilities, personalities, and general effectiveness in carrying out their duties.

6. The significance of the individual person, coming close as it does to being the ultimate value in our society, should in part be recognized by earned rewards.[8]

Individual differences such as intelligence, academic aggressiveness, aptitudes, interests, physical strength and coordination, social competence, financial independence, and many others, will affect the approach to the study of the sciences. The teacher needs to be aware of the differences, as well as to be equipped to test for these differences. Much information about the individual student can be gained through

---

[8]Lester S. VanderWerf, "Evaluation of Teaching," The Bulletin of the National Association of Secondary-School Principals, Vol. 40 (October, 1956), pp. 78-87.

standardized tests, inventories, observation techniques, and other similar techniques. This will enable the teacher to help the student know himself and to capitalize upon his strength. The supervisor can aid the teacher in varying the types of problems and learning exercises that are used by locating and encouraging the use of exercises that require research in a good library, the use of audio-visual aids, conferences with informed persons, group work, reflective thinking, experimentation, demonstrations, and reports.[9] All of this activity will lead to a program of instruction that will meet the individual needs of the students.

The improvement of instruction is one of the most important functions of the supervisor. In this area of his work, the supervisor can find his greatest delight as well as meet his greatest challenge. It is here that he will come into direct contact with differences in attitudes, goals, methods, and ideas as to what should be done. His task will not be to impress his will on the staff, as was pointed out earlier, but rather to encourage the development of the thoughts and effectiveness of the group as citizens of a developing nation that needs help from its educators.

---

[9]W. B. Killebrew, "Adapting Curriculum to Individual Needs," The Bulletin of the National Association of Secondary-School Principals, Vol. 43 (February, 1959), p. 20.

CHAPTER V

THE SCIENCE SUPERVISOR AND IN-SERVICE TRAINING

The area in which the science supervisor can offer possibly his greatest service to the teaching staff is that of in-service training. The in-service program can consist of such devices as: (1) individual school unit in-service training, (2) demonstration lessons, (3) workshops, (4) faculty meetings, (5) talks by special consultants, (6) college off-campus courses, (7) short courses, (8) work sessions, and (9) inter-communication of the staff.[1]

Planning for any individual school in-service training program should be planned, or at least, coordinated by the science supervisor. Such a program might be planned, for example, as a one-day program for the elementary teachers prior to the opening of school in the fall. The arrangements should be completed in time to have any consultants or group leaders designated and notified as to time, place, subject

---

[1]Howard R. Munson, "Toward a New School Science Program," The Elementary School Journal, Vol. 59 (October, 1958), p. 24.

and goal of the program. The consultants would be most effective if they can be selected from the subject matter areas of the high school. With this arrangement, there would be no time lost gaining rapport with the group. Also, the participants would feel free to comment and offer suggestions with this arrangement. The teachers, that will be involved in such a program, should be given definite responsibilities as to materials and supplies to bring and demonstrations or such that will be given. Such an institute should concern itself with definite classroom problems in the teaching of science. If such a program is well planned as to subject, materials and procedures, it should prove to be an effective way of giving the teacher direct help in his immediate teaching problems.

The demonstration lesson form of in-service training may be used effectively throughout the school year. As it generally would be dealing with only one particular item of instruction, its scope of coverage would not be great. With this point in mind, the demonstration lesson should not be relied on to the exclusion of other in-service training techniques.

The demonstration lesson should be presented to a group composed of teachers of one school unit or several

surrounding school units who teach the same grade level, and should be built around the lesson in science that is being taught at the time the demonstration is given. The lesson may be brought by a particularly effective teacher from the grade level in question, an outside specialist, such as a book company representative, or the science supervisor. The important thing about the lesson is that time must be allowed at the completion for an open discussion between the demonstrator, the science supervisor, and the observing teachers. This would also give time for the teachers to handle or try any particular apparatus the demonstrator might have used. The elementary and possibly the junior high teacher needs to be encouraged to use actual demonstrations of the points in question in the science lesson more freely, and not to feel apprehension about their ability to be effective. The demonstration lesson can be a great service to the teachers in this respect.

The workshop is a flexible organization of educational personnel who are working together and separately along their lines of interest to improve themselves in their individual jobs and to improve the schools in which they serve.[2] The

---

[2]Robert C. Hammock and Ralph S. Dwings, Supervising Instruction in Secondary Schools (New York, 1955), p. 133.

well-planned workshop should have a definite purpose and the teachers should feel a specific need for the program. The workshop might be carried out in evening sessions running for several days and thereby not interfer unduly with the teacher's off-time.

The teachers will derive their greatest benefit from the workshop by being able to actually experiment, with expert advice close at hand. Time should be allowed for this individual work by the teacher. The actual planning of the workshop should include:

1. Identifying the interests and problems which need work.

2. Appointing a committee to choose activities with which the workshop will be concerned.

3. Encouraging teachers to work on their own problems.

4. Selecting a time and place for holding the workshop based upon (1) the securing of consultant services, (2) allowing for all or nearly all of the professional staff members to attend, and (3) having adequate library facilities available for reference work.[3]

An all-important part of the workshop will be

---

[3]Ibid., p. 143.

arrangements for it to count towards professional advancement. This will serve to stimulate effective work by the teacher, give added zest to attendance, and give rightful recognition to those availing themselves of the opportunity for professional growth.

Work sessions should allow the teachers in a particular school time to talk, plan, and work out details among themselves for the teaching of a coming unit. These sessions can be carried out by the teachers themselves with the supervisor sitting in occasionally as a resource person.

Through in-service training, the supervisor can get acquainted with the work of his individual teachers and can see first hand their capabilities. It is in this area, that he can serve his teachers in a direct manner.

CHAPTER VI

SUMMARY

The science supervisor will be interested in the whole of the educational scene, and he will be working with all facets of the educational system. The teachers, students, facilities, the materials, methods, and effects of this system on our national purpose will be of direct concern to the supervisor. He will be in a position to materially affect all of these, and it is imperative that he be aware of the many things that can bring about the quality science program, K-12, that is needed today.

In closing, the following thoughts taken from a report of the National Association of Secondary-School Principals should guide the science supervisor as he seeks to serve. They are:

1. All students at all grade levels have some interest in all areas of science.

2. All students at all grade levels develop different qualities of concepts during experiences in science.

3. Teachers should teach with their objectives showing.

4. A good unit in science is one that is organized to make use of the problem-solving method.

5. The supervisor and the teachers should avoid underestimating the abilities of the student to develop science concepts of quality.

6. An integrated science program from kindergarten through the twelfth grade can make use of the interests in science that students have and can improve the quality of the experiences they have in studying science.

7. Opinion is not enough in the field of science, nor is it enough in the field of science education.

8. Have your teachers observe elementary science lessons.

9. Make your secondary-school science program an integral part of a K-12 program for your school system.

10. Have your teachers participate in planning a K-12 program.

11. Encourage teachers to think about what science really is.

12. Help your teachers understand <u>why</u> they are teaching <u>what</u> they are teaching.

13. Help your teachers realize that science is important to the "lower fifty per cent" and to work enthusiastically with this group of students.

14. Science teachers at all educational levels must make a more careful selection of subject matter.

15. The total responsibility for planning a developmental science program must be shared among many science teachers.

16. No specialized or advanced science classes should be offered unless properly-trained staff and adequate facilities are available.[1]

---

[1] Quality Science for Secondary Schools (Washington, D. C., 1960), pp. 7-87.

BIBLIOGRAPHY

Adams, Harold P., and Frank G. Dickey. Basic Principles of Supervision. New York: American Book Company, 1953.

Beck, Robert H., Walter W. Cook, and Nolan C. Kearney. Curriculum in the Modern Elementary School. New York: Prentice-Hall, Incorporated, 1953.

Crosby, Muriel. Supervision as a Co-operative Action. New York: Appleton-Century, Crofts, 1957.

Douglass, Harl R., and Charles W. Boardman. Supervision in Secondary Schools. Boston: Houghton Mifflin Company, 1934.

Dutton, Wilbur H. "Measuring Attitudes Toward Arithmetic." Elementary School Journal, LV (September, 1954), 24-31.

Fielstra, Clarence. "Supervision Today." The Bulletin of the National Association of Secondary-School Principals, XXXIV (December, 1950), 9-20.

Gonnelly, Joseph F. "Rating of Teachers by Supervisors," Bulletin of the Department of Secondary-School Principals of the National Education Association, XII (March, 1928), 86-93.

Gould, George. "Do Principals Supervise and How?" The Bulletin of the National Association of Secondary-School Principals, XXVI (May, 1942), 67-83.

Hammock, Robert C., and Ralph S. Owings. Supervising Instruction in Secondary Schools. New York: McGraw-Hill Book Company, 1955.

Jones, Phillip S. "Articulation Between Elementary and Secondary School," The Bulletin of the National Association of Secondary-School Principals, XLIII (May, 1959), 107-11.

Judd, Charles H. "Can High School Supervision be made Scientific?" The Bulletin of the National Association of Secondary-School Principals, XII (March, 1928), 152-66.

Killebrew, W. B. "Adapting Curriculum to Individual Needs," The Bulletin of the National Association of Secondary-School Principals, XLIII (February, 1959), 20-22.

Mersand, Joseph. "Creative Supervision in the Secondary School," The Bulletin of the National Association of Secondary-School Principals, XLIII (December, 1959), 23-30.

Munson, Howard R. "Toward a New School Science Program," The Elementary School Journal, LIX (October, 1958), 22-25.

Newlon, Jesse H. "Creative Supervision in High School," The Bulletin of the National Association of Secondary-School Principals, XIII (March, 1929), 20-31.

Seybold, Arthur M. "A Plan for Cooperative Supervision," Bulletin of the Department of Secondary-School Principals of the National Education Association, XVI (March, 1932), 62-67.

Spain, Charles R., and Harold D. Drummond. Educational Leadership and the Elementary School Principal. New York: Rinehart and Company, Incorporated, 1956.

Taylor, Paul R., and others. The Improvement of Science Instruction in Oklahoma, Grades K-12. Oklahoma City: Oklahoma State Department of Education, 1960.

VanderWerf, Lester S. "Evaluation of Teaching," The Bulletin of the National Association of Secondary-School Principals, XL (October, 1956), 78-87.

Williams, Catharine M. "A Portable Mathematics Laboratory for In-Service Teacher Education," Educational Research Bulletin, XXXIX, No. 4 (April, 1960), 85-91.

VITA

Joe Warren Landry

Candidate for the Degree of

Master of Science

Seminar Report: THE SCIENCE SUPERVISOR AND THE INTEGRATED SCIENCE PROGRAM, K-12

Major Field: Natural Science

Biographical:

Personal Data: Born in Denham Springs, Louisiana, September 17, 1933, the son of Warren Doyle and Carrie Webb Landry.

Education: Attended grade school in Baton Rouge, Oakdale, and Baker, Louisiana; Graduated from the Baker High School magna cum laude in 1951; attended Louisiana State University; received the Bachelor of Science degree from Louisiana State University, with majors in Science and Education, in June, 1958; completed requirements for the Master of Science degree in July, 1961, at the Oklahoma State University.

Professional Experience: Served in the United States Air Force from April, 1954 to February, 1956; taught physics in the Baker High School, Baker, Louisiana in 1958-1959; served as the Traveling Science Teacher for the National Science Foundation through Oklahoma State University in Louisiana in 1959-1960; attended the Academic Year Institute sponsored by the National Science Foundation at Oklahoma State University in 1960-1961; presently on appointment to the Imperial Ethiopian College of Agriculture and Mechanical Arts through Oklahoma State University for the period 1961-1963.